

Heavy vehicle charges
determination: decision
regulation impact
statement
December 2021

Report outline

Title	Heavy vehicle charges determination: decision regulation impact statement, December 2021
Type of report	Decision regulation impact statement
Purpose	For consideration by infrastructure and transport ministers as part of the heavy vehicle charges determination to inform heavy vehicle charges from 2022–23 onwards.
Abstract	This decision regulation impact statement analyses a range of options for setting heavy vehicle charges that would apply from 2022–23. It considers a range of technical changes to the PAYGO model and presents alternative options for cost allocation and implementation.
Attribution	<p>This work should be attributed as follows:</p> <p>Source: National Transport Commission 2021, <i>Heavy vehicle charges determination: decision regulation impact statement</i>, NTC, Melbourne.</p> <p>If you have adapted, modified or transformed this work in any way, please use the following:</p> <p>Source: Based on National Transport Commission 2021, <i>Heavy vehicle charges determination: decision regulation impact statement</i>, NTC, Melbourne.</p>
Key words	Heavy vehicle charges, PAYGO, RUC, registration charges
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Summary

This decision regulation impact statement (D-RIS) seeks feedback on options for setting future heavy vehicle charges to recover the cost of road construction and maintenance attributed to 27 classes of heavy vehicles that form the basis of the heavy vehicle charges determination.

The National Transport Commission (NTC) was directed by transport ministers in November 2019 to conduct a new heavy vehicle charges determination that would form the basis for setting heavy vehicle charges to apply from 2022–23.

Heavy vehicle charges consist of a yearly registration charge and a road user charge (RUC) on diesel fuel. These charges are set under a charging framework known as ‘pay as you go’ (PAYGO).

The overarching regulatory problem for this determination is to recommend an efficient and equitable set of heavy vehicle charges that adequately recovers the cost of road construction and maintenance from heavy vehicles in Australia (the problem and related limitations are discussed in chapter 2). This must occur while complying with a range of pricing principles.

Context

In making recommendations for setting heavy vehicle charges, the NTC must adhere to a set of pricing principles set by transport ministers. These principles are:

‘National heavy vehicle road use prices should promote optimal use of infrastructure, vehicles and transport modes.

This is subject to the following:

- full recovery of allocated infrastructure costs while minimising both the over and under recovery from any class of vehicle
- cost-effectiveness of pricing instruments
- transparency
- the need to balance administrative simplicity, efficiency and equity (e.g. impact on regional and remote communities/access)
- the need to have regard to other pricing applications such as light vehicle charges, tolling and congestion.’

This determination is being prepared against a backdrop of a global pandemic that has caused significant social and economic disruption for Australia, consideration of Heavy Vehicle Road Reform that is expected to replace the PAYGO model, and inherent limitations of the PAYGO model. Collectively, these shape the options that are feasible within the scope of the determination.

We explored a wide range of technical issues in the consultation regulation impact statement (C-RIS) (NTC, 2021). Key recommended technical changes included:

- exploring options to ensure the ongoing availability of usage data
- using new, updated equivalent standard axle (ESA, a measure of the road wear caused by different heavy vehicle types) values to allocate costs

- removing MaxMan (Matrix Manipulation, a section of the PAYGO model used to reallocate costs between different heavy vehicle types) from the model
- adjusting fuel usage estimates for leakages due to RUC exemptions for fuel used to drive auxiliary equipment
- reviewing and updating the unsealed road travel discount based on a new survey
- removing the community service obligations discount
- recalculating the regulatory component of registration charges using the current formula, updated usage data and the current approved National Heavy Vehicle Regulator budget as inputs
- taking action to ensure the ongoing availability of suitable usage data given that the Australian Bureau of Statistics has discontinued the Survey of Motor Vehicle Use.

The recommended technical model improvements underpinned all options explored in the C-RIS. They also underpin the options explored in this D-RIS.

The options

Incorporating the recommended technical changes outlined in chapter 4, this D-RIS recommends a preferred cost allocation option and a preferred implementation pathway. In developing these preferred options, the NTC took into account the information and initial feedback received through the series of initial workshops with industry and government stakeholders.

Cost allocation options

Under PAYGO, costs to each vehicle class are allocated using a combination of a cost allocation matrix and data on vehicle use, commonly referred to as 'usage data'. This process determines the percentage of total costs allocated to heavy vehicles and light vehicles respectively.

The size of the heavy vehicle cost base, and the level of heavy vehicle charges, are sensitive to the cost allocation specified in the cost allocation matrix. Government revenues from heavy vehicle charges are also directly affected by the cost allocation process.

After analysis, the challenge that emerged for this D-RIS is that all options produce outcomes that comply with the principle that the cost allocation to a particular group of users should fall between standalone and incremental cost. This means that the choice between cost allocation approaches is one of judgement based on wider considerations, rather than pure economic or scientific analysis. One of the motivating factors to consider a possible change is that some options may allocate road wear costs more accurately than others. However, the benefits of doing so are likely to be limited by the highly averaged nature of heavy vehicle charges.

We have therefore built the options for consideration in this determination around the three possible cost allocation approaches, being the:

- current approach – this is the status quo and retains the current cost allocation matrix
- modified current – modify the current cost allocation matrix to allocate 70 per cent of costs in expenditure category B2 using ESA per kilometre as the measure
- VIC DTF/DOT – use the work commissioned by Victorian Department of Treasury and Finance and the Victorian Department of Transport to develop alternative cost allocators,

which broadly reflects the cost allocators recommended by the Australian Road Research Board in its report (ARRB, 2019).¹

Table 1 describes the impact of the three cost allocation options on the estimated heavy vehicle cost base and the gap between estimated revenue and the heavy vehicle cost base.

Table 1. Cost allocation options – estimated heavy vehicle cost base and revenue gaps

Estimated revenue gap 2022–23	\$m	Gap (\$m)	Gap (%)
Estimated revenue from heavy vehicle charges in 2022–23 if charges were frozen	3,440		
2021–22 heavy vehicle cost base – current	4,217	777	22.6
2021–22 heavy vehicle cost base – modified current	4,516	1,076	31.3
2021–22 cost base VIC DTF/DOT	4,919	1,478	43.0

The decision between these options needs to focus on the following considerations:

- The revenue from current heavy vehicle charges is insufficient to recover the heavy vehicle cost base under the current cost allocation approach. Changing cost allocators will increase this gap.
- The modified current approach represents a small technical change to the current approach, which seeks to better reflect the relationship between vehicle weight and road wear.
- The VIC DTF/DOT approach is a fundamental departure from the current and modified current approaches. It is based on Victorian data only and has not yet been externally reviewed.
- The choice between cost allocation approaches is one of judgement based on wider considerations rather than pure economic or scientific analysis.

Implementation options

In line with the pricing principles, the objective of the determination is to deliver full cost recovery over time. Direct implementation is the approach followed in most previous determinations and would move immediately to full cost recovery. This would require an increase in heavy vehicle charges of at least 22.6 per cent in 2022–23.

¹ This work was developed by the Victorian Department of Transport and the Department of Treasury and Finance to inform discussions around cost allocation. It is not approved Victorian Government policy.

The current economic conditions, the impact of COVID-19, and questions around the ability of industry to absorb such a significant increase in charges make it questionable whether this option is feasible. The D-RIS has therefore explored two other options that seek to moderate the impact on industry.

An alternative to an immediate move to full cost recovery is to consider a multi-year price path that would seek to move towards recovering costs over a longer timeframe. Setting charges for multiple years would allow the transition towards full cost recovery to begin at a measured pace in a way that recognises the cost recovery principle underpinning PAYGO while also recognising that moving to full cost recovery immediately would impose an unreasonable burden on heavy vehicle operators.

Agreeing a multi-year price path has the potential to reduce administrative and compliance costs for governments and industry.

A defined price path may offer additional advantages in that it would provide industry with certainty about the heavy vehicle charges that would apply in the medium term, allowing vehicle operators to make better pricing decisions and reflect them in contracts.

We have explored options for a three-year price path as the best compromise between providing certainty and reducing the risk of the gap between the heavy vehicle cost base and heavy vehicle charges revenue widening significantly during the price period.

In consideration of the range of complexities, the following implementation options are explored in this D-RIS:

- Direct implementation in 2022–23 with automatic annual adjustments to ensure full recovery of the identified heavy vehicle cost base in subsequent years. This is the baseline option.
- Three-year fixed price implementation pathway where transport ministers agree to fixed yearly price changes for three years:
 - Pathway 1: Three-year price path with average increases of 2.75, 3.0 and 3.5 per cent per annum over the three years. These yearly increases reflect a compromise between the need of governments to recover increasing expenditure on roads and managing the impact on heavy vehicle operators.
 - Pathway 2: Three-year price path with average increases of 6 per cent per annum over the three years. This option would see charges increase faster than under pathway 1 in an attempt to move closer to full cost recovery faster.

The NTC considers that the choice between the three implementation options lies in the trade-off between achieving cost recovery over time and the need to consider the impact on industry, with particular consideration for equity issues such as the likely impact on remote and rural communities.

Stakeholder submissions and feedback

In respect of the technical changes proposed in the C-RIS, the NTC's recommendations were generally supported for: retaining the existing PAYGO expenditure categories; the proposed approaches for usage data and the treatment of electric vehicles; using the updated ESA values; removing MaxMan; the treatment of concessions (albeit with some concerns raised about primary producer concessions); reassessing the unsealed road discount using a new survey; and recalculating the regulatory component registration charges using new data.

There were mixed views on the NTC's proposed treatment of innovative funding and financing, whether to address RUC leakages, and on the preferred cost allocation approach (with some support for each of the three options but the highest number of submissions supporting a retention of the current cost allocators). Industry submissions were not in favour of removing the community service obligations (CSO) discount.

All submissions that commented on an implementation option supported a three-year fixed price path rather than direct implementation. However, there were different views on the specific details of the price path, with several submissions proposing increases that were lower than the 3.5 per cent per annum pathway used in the C-RIS. Some submissions sought increases to be capped at the rate of increase of the consumer price index (CPI).

A detailed summary of the points raised in submissions is attached as Appendix E. Copies of submissions are available for viewing on the [NTC's website](#).

Final recommendations

The NTC has developed its final recommendations having considered the views expressed in formal submissions and information gathered through a wide range of conversations with stakeholders. These are outlined throughout this document and summarised in Table 31 on page 98 in chapter 7.

The key recommendations are that:

- a range of technical improvements, discussed and recommended in chapter 4, should be made to the PAYGO model
- the modified current approach (option B) to cost allocation should be adopted
- a three-year fixed price implementation pathway should be adopted, with heavy vehicle charges being increased by 2.75 per cent in 2022–23, 3.0 per cent in 2023–24 and 3.5 per cent in 2024–25.

Next steps

This D-RIS makes recommendations to the Infrastructure and Transport Ministers' Meeting (ITMM), which will be considered in December 2021. Transport ministers are expected to identify a preferred option for setting heavy vehicle charges to apply from 2022–23.

Following the meeting, ministers are expected to direct the NTC to consult further on the preferred option, in line with the *Fuel Tax Act 2006*.

ITMM will then consider any submissions received on the preferred option and make a final decision on registration charges and RUC to apply from 2022–23. It is expected that this will occur in late February 2022.

New heavy vehicle charges based on ITMM's decisions would then be implemented effective 1 July 2022.

1 Introduction

1.1 ITMM directions to the NTC

In November 2019 the then Transport and Infrastructure Council (now Infrastructure and Transport Ministers' Meeting, ITMM) directed the National Transport Commission (NTC) to conduct a new determination that recommends heavy vehicle charges that would apply from 2022–23.

1.2 What are heavy vehicle charges?

Heavy vehicle charges apply to all vehicles with a gross vehicle mass (GVM) of over 4.5 tonnes.

There are three components to the charges paid by heavy vehicles:

- the road user charge (RUC) administered by the Commonwealth Government
- the roads component of the registration charge, as applied by state and territory governments
- the regulatory component of the registration charge (regulatory charge), which covers the operating cost of the National Heavy Vehicle Regulator (NHVR).

The RUC and registration charge are designed to reflect the cost to governments of building and maintaining roads for trucks. The amount to cover the cost of the NHVR is designed to vary in line with the NHVR's budget, which is approved by ITMM.

1.3 Background to the PAYGO system

Heavy vehicles in Australia are defined as any vehicle weighing over 4.5 tonnes. These vehicles are charged an annual registration charge and a RUC, which is levied on each litre of fuel (diesel, petrol or blended fuels).

These charges are set under a charging framework known as 'pay as you go' (PAYGO). The primary objective of the PAYGO system is to deliver nationally consistent heavy vehicle charges that allow governments to recover capital and operating expenditure related to heavy vehicle use in the year they are incurred. Governments have agreed several pricing principles that underpin the operation of the PAYGO system.

The NTC has been administering the PAYGO system for more than two decades. During that time the NTC has completed several heavy vehicle charges determinations aimed at refining the PAYGO system and ensuring heavy vehicle charges reflect the most up-to-date information on road expenditure and road use.

The last heavy vehicle charges determination was delivered to governments in early 2014. Since then, several changes to government road expenditure and road use by heavy vehicles have occurred. This determination provides an opportunity to review the PAYGO system, its assumptions and data to ensure it remains current.

1.4 High-level approach and scope for this determination

1.4.1 Approach

This heavy vehicle charges determination uses the work that was conducted as part of the previous determination in 2014 as its starting point.

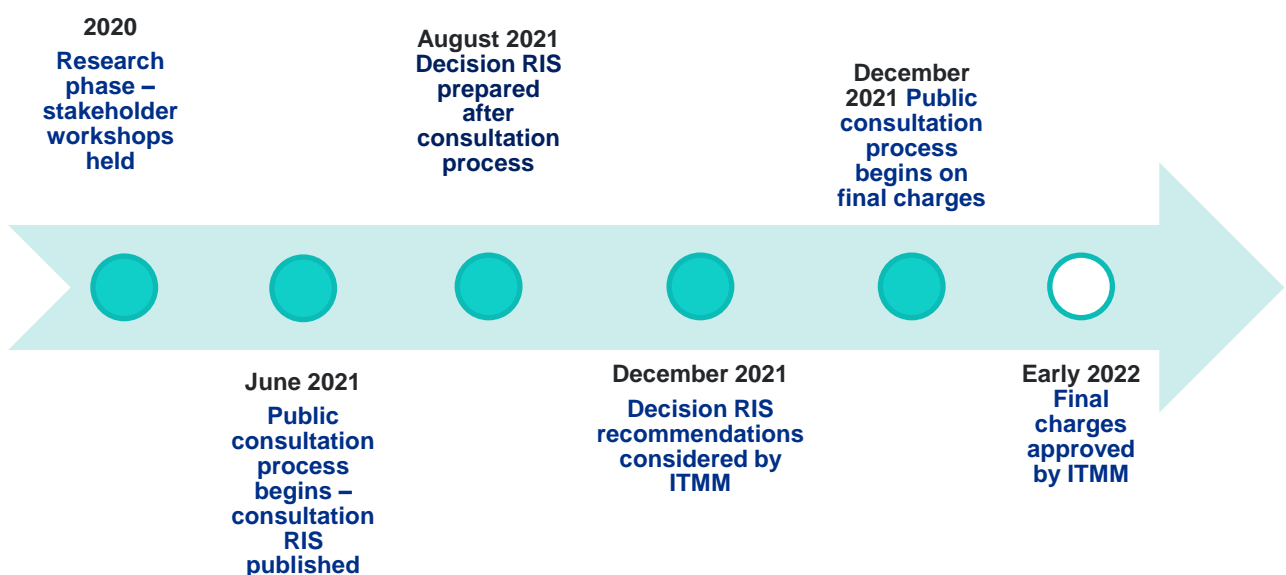
The determination is conducted while work on the Heavy Vehicle Road Reform (HVRR) agenda proceeds. This determination is designed to be consistent with and provide a platform for implementing future reform if agreed. The HVRR direction affects and provides a boundary for the scope of this determination. The HVRR agenda, as it affects this determination, is set out in more detail in section 3.3.

The determination consists of several phases:

- scoping
- analysis and investigation (in several workstreams)
- option definition
- option modelling
- regulation impact statement (RIS) development (including consultation on the draft RIS)
- implementation.

Engagement with governments, industry associations and individual operators will occur during all phases. A high-level timeline is depicted in Figure 1.

Figure 1. Project timeline



1.4.2 Scope

A heavy vehicle charges determination typically involves examining all aspects of the PAYGO methodology to ensure it produces outcomes that are consistent with the pricing principles.

What is in scope

Specifically, the scope included reviewing the following aspects of the current PAYGO methodology and, where possible, exploring alternative options:

- measuring road expenditure by state and territory governments over time, including investigating options to improve the reliability and quality of data sources
- measuring local government road expenditure, including the reliability and quality of data sources
- exploring possible approaches to minimise the volatility of heavy vehicle charges without compromising cost recovery in the longer term
- allocating expenditure between the different vehicle classes, including the cost allocation matrix used in the cost allocation process
- road use and fuel consumption data, and how it is used in the model
- how toll roads, partially tolled roads, public–private partnerships (PPPs) and other innovative financing models are treated
- the relativity of charges paid by different heavy vehicle classes.

In assessing the current model and potential changes, the NTC has also assessed:

- the impact on the heavy vehicle industry in general, and on different operators within the industry
- the impact on remote and rural communities
- overall economic and fiscal implications.

What is out of scope

The following issues were not considered as part of the determination:

- changes to the PAYGO pricing principles
- changes to the responsibility of ITMM for approving heavy vehicle charges
- implementation of a forward-looking cost base (FLCB)
- changes to the way the NHVR’s approved budget is recovered through the regulatory component of heavy vehicle registration charges (although changes to the amount of the regulatory component of registration charges and the relativities between different heavy vehicle types may be considered)
- changes to any of the current pricing mechanisms consisting of registration charges and the RUC
- changes to the way heavy vehicle charges revenue is collected.

1.5 Consultation to date

As part of preparing the consultation RIS (C-RIS), we held several workshops with industry and government stakeholders. The workshops covered the topics listed in Table 2.

Table 2. Topics covered at workshops

Workshop number	Topic
1	Scope and process Trust in and quality of expenditure data Expenditure categories Treatment of toll roads
2	Overview of cross-subsidy check Multi-year price setting, dealing with under charging and over charging Usage data Cost allocation process overview and issues
3	MaxMan – role and effect Leakages Concessions – summary and current approach Averaging and other related issues
4	Equivalent standard axles Cost allocation options overview Vehicle operating costs
5	Annual adjustment Implementation/transition Other outstanding issues
6	Developing coherent options to be included in the RIS Process to C-RIS and beyond

The feedback received through these workshops allowed the NTC to test a range of ideas ahead of the C-RIS. The information gained from these workshops has directly influenced the proposed model enhancements and determination options set out in chapters 4 and 5 respectively.

Following the release of the C-RIS (NTC, 2021), the NTC held six public information sessions in July 2021. Additional briefings were offered to all states and territories and to major industry associations (with a total of three briefings for industry and six for government being provided).

The public consultation period on the C-RIS ran from 28 June 2021 to 24 August 2021. The NTC received 13 submissions, and these have informed the assessment and final recommendations in this decision RIS (D-RIS).

1.6 This decision RIS

This D-RIS is structured as follows:

- Chapter 2 outlines the regulatory problem this determination is trying to solve.

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- Chapter 3 provides the context within which this determination is being carried out.
- Chapter 4 explores a range of possible improvements to the PAYGO model and the assumptions and data used.
- Chapter 5 presents three broad determination options and compares them.
- Chapter 6 explores different implementation options.
- Chapter 7 provides a summary of the final recommendations and outlines next steps.

2 Problem statement

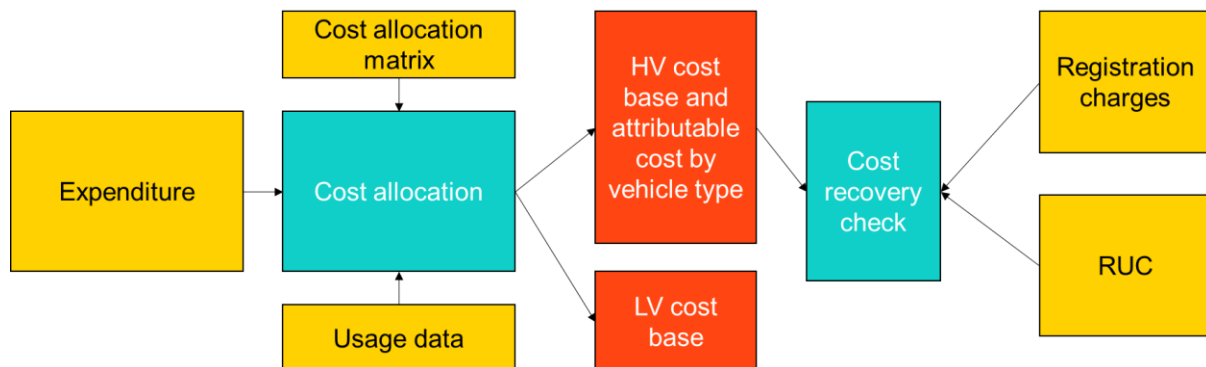
2.1 Cost recovery over time in an efficient and equitable manner

The overarching regulatory problem for this determination is to recommend an efficient and equitable set of heavy vehicle charges that adequately recovers the cost of road construction and maintenance for heavy vehicles in Australia.

The current PAYGO model has now been in use since the 2014 determination. There have been many changes to the way the heavy vehicle fleet operates, and some key inputs, such as equivalent standard axle (ESA) values, are likely to have become outdated. It is therefore necessary to subject the current model to a comprehensive review to ensure inputs and assumptions are up to date and reasonable.

Figure 2 provides a high-level overview of the PAYGO model. Seven years of expenditure data in each expenditure category is averaged using the exponential moving average methodology. The cost allocation matrix specifies cost allocators for each expenditure category, and this is combined with usage data (for each cost allocator) and the averaged expenditure data to allocate costs to heavy vehicles and light vehicles. The cost allocation process also calculates attributable costs for each vehicle class, which are used in the cost recovery check. The cost recovery check compares the attributable costs for a vehicle class with the registration charges and RUC paid to ensure there is no cross-subsidisation between heavy vehicle classes (as well as checking that the aggregate charges paid by all heavy vehicles is equivalent to the heavy vehicle cost base).

Figure 2. Overview of the PAYGO model



2.1.1 Pricing principles

The NTC must adhere to the pricing principles that originate from the Australian Transport Council (ATC) (now ITMM) and the National Cabinet (formerly the Council of Australian Governments). These principles are:

‘National heavy vehicle road use prices should promote optimal use of infrastructure, vehicles and transport modes.

This is subject to the following:

- full recovery of allocated infrastructure costs while minimising both the over and under recovery from any class of vehicle
- cost-effectiveness of pricing instruments

- transparency
- the need to balance administrative simplicity, efficiency and equity (e.g. impact on regional and remote communities/access)
- the need to have regard to other pricing applications such as light vehicle charges, tolling and congestion.⁷

Following the Productivity Commission's inquiry into road and rail infrastructure pricing in 2006, the ATC provided further direction to the NTC:

ATC direct the NTC, in developing its determination, to apply principles and methods that ensure the delivery of full cost recovery in aggregate, further develop indexation adjustment arrangements to ensure the ongoing delivery of full expenditure recovery in aggregate and remove cross subsidisation across different heavy vehicle classes, recognising that transition to any new arrangement may require a phased approach (ATC, 2007).

2.1.2 Objective of the determination

This determination sets out the options available in accordance with the pricing principles and notes the limitations associated with each option to address the variety of issues that have arisen. While the determination takes into consideration the issues raised through consultation and the broader context outlined in this report, it is limited in its ability to fully address these because it is bound by the pricing principles and the limitations of the PAYGO system.

2.2 Features and limitations of the current charging framework

There are inherent limitations in the PAYGO methodology that cannot be resolved without more extensive reform, as being considered through the HVRR agenda.

These limitations are outlined below.

2.2.1 Recovery of capital costs up-front

The PAYGO methodology recovers annual government capital and operating expenditure on roads in a single year. Capital expenditure is volatile and 'lumpy' in that a single large project can have a significant effect on total expenditure. This leads to the heavy vehicle cost base and heavy vehicle charges being more volatile than they would be if set under a methodology that spreads capital expenditure over the life of the asset (which may be up to 100 years).

2.2.2 Averaging

It is common for an infrastructure charging regime to apply averaging to some degree because deriving a user's precise cost on the network is either impossible or too costly to ascertain. The PAYGO charging framework uses several types of averaging to calculate heavy vehicle charges. This includes averaging expenditure over time, averaging usage data, and then comparing allocated costs with charges paid by the average vehicle in each class.

The model uses the Survey of Motor Vehicle Use (SMVU) data from the Australian Bureau of Statistics (ABS) for vehicle kilometres travelled (VKT), fuel consumption and gross tonne kilometres (GTK) by vehicle class (e.g. 3-axle rigid truck). These inputs are in the form of an

average for each vehicle class (e.g. 2-axle rigid truck under 7 t GVM, 6-axle articulated truck). Costs are allocated to each vehicle class based on these average values. Therefore, the registration charges applying to each vehicle class will reflect the costs allocated to the average vehicle in this class.

The result is that individual operators of a particular type of vehicle who travel less, or operate at below average weights, will pay a higher registration cost per tonne/kilometre than another user who travels above the average distance or operates above average weights.

This 'inequity' within a vehicle class typically affects certain types of operators (e.g. primary producers who only use their vehicle seasonally to move livestock from the paddock to the point of sale). Similarly, volume-constrained operators will fare differently from mass-constrained operators. Effectively, the fact that charges for different vehicle classes are set based on average usage characteristics creates a disparity between what operators should be charged to accurately reflect their road use and what they are actually charged. Which operators are charged less than they should be and which operators are charged more depends on the structure of charges, the balance between registration and the RUC, and the nature of the operator's usage.

2.2.3 Setting average national charges to recover national expenditure

The heavy vehicle cost base is derived by measuring heavy vehicle-related road expenditure across all jurisdictions and calculating a national heavy vehicle cost base. Heavy vehicle charges are then set to recover the cost base through charges that are set nationally. This methodology does not ensure the revenue received by each a state or territory equals their historic or future expenditure, thus creating a possible disjoint between investment and revenue for states and territories.

A state or territory undertaking additional new capital or maintenance works will not necessarily recoup the full value of the additional expenditure, while those jurisdictions that did not increase expenditure still benefit from the resulting increase in heavy vehicle charges to some degree, thus introducing geographic cross-subsidisation.

2.2.4 Charges apply nationally on all road types

Heavy vehicle charges apply nationally regardless of location or road type. This necessarily means that a vehicle travelling on a poor-quality road may perceive that they are receiving a poor service quality compared with an identical vehicle travelling on a well-constructed, smooth road.

Road quality will affect fuel consumption for a given vehicle and load, with fuel consumption likely to be higher on poor-quality roads. This may result in those operators travelling on the worst quality roads paying more in RUC while experiencing a poor level of service.

On the other hand, well-constructed roads are likely to be damaged less by heavy vehicle use, resulting in lower unit costs compared with poorly constructed roads that wear out more. Therefore, if charges apply uniformly, it is also possible that users of high-quality roads are disadvantaged compared with the users of lower quality roads. The same may apply in respect of high and low traffic volumes.

2.2.5 Limited number of pricing instruments

Heavy vehicle charges consist of registration charges for different types of vehicles and the RUC, which applies to all vehicles. This limited number of pricing instruments, and the fact

that these charges are intended to be applied nationally, mean it is not possible to achieve precise pricing outcomes. For example, it is not possible to ensure all vehicle classes pay precisely their allocated costs.

2.2.6 Input data limitations

The PAYGO model uses SMVU datasets from the ABS to calculate heavy vehicle charges. The ABS published these datasets annually until 2007. No data was collected in 2008 or 2009. In 2010 the survey recommenced, with the collection frequency reduced to once every two years. Reducing the frequency of the SMVU to once every two years has required usage data to be estimated for intermittent years, reducing reliability and accuracy in those years.

Furthermore, the SMVU dataset originates from a survey rather than a full census of heavy vehicle usage, making it an estimate rather than a precise measure. This is reflected in the standard errors associated with certain vehicle classes. A further limitation of the survey method used to produce the SMVU dataset is the self-report method of data collection. Poor recollection of the required information or misunderstanding of the question can contribute to inaccuracies in the data.

The ABS has confirmed that the 2020 SMVU is the last produced, which will make it necessary to source alternative usage data for future use. Section 4.5 discusses this in more detail.

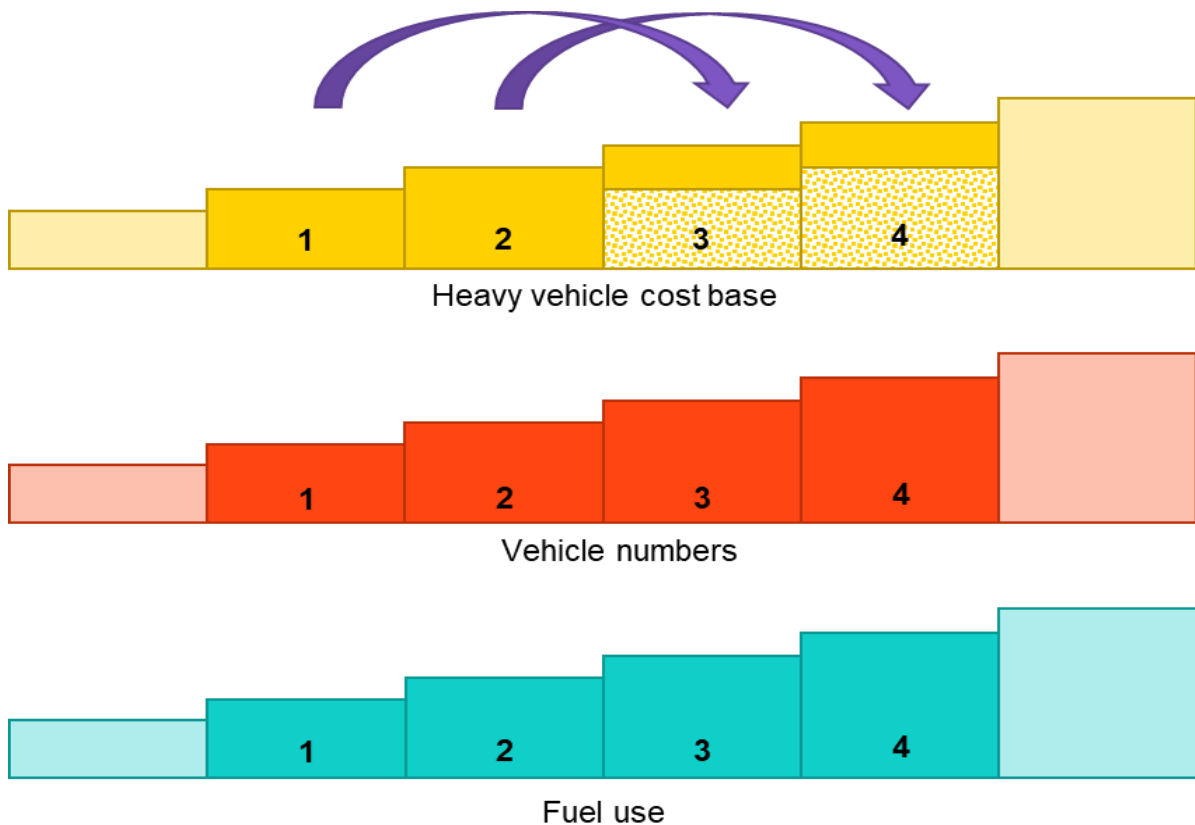
2.2.7 Non-deterministic charge setting framework

The NTC makes what is effectively a recommendation on national charges, which is not technically binding on state and territory governments. Non-implementation and a wide range of concessions being offered across state and territory governments have the potential to undermine the national nature of the charges. The charging framework also lacks a defined and comprehensive governance framework to guide what conditions should trigger a new determination. This lack of clarity leads to price reviews being initiated on an ad hoc basis.

2.2.8 Lag between cost base measurement and implementation of charges

The current PAYGO methodology involves a lag between the measurement of the cost base and the implementation of charges that are set to recover the cost base. For example, the charges that will be outlined in the D-RIS are based on expenditure data for the seven years up to and including the 2020–21 financial year. However, any charges approved by ITMM would not become effective until 1 July 2022 at the earliest. This has always been a feature of PAYGO and any associated annual adjustment mechanism. Figure 3 illustrates the delay.

Figure 3. PAYGO – timing difference illustration



Under PAYGO, the expenditure data and vehicle numbers are collected after the end of year 1 (based on the seven years of expenditure and fuel consumption data leading up to and including year 1). This information is then used to determine the cost base and set charges during year 2. The earliest they can then be applied is in year 3. These charges, which reflect the cost base and vehicle numbers in year 1, are then collected in year 3 from the actual number of vehicles registered in year 3, and on the actual amount of fuel used in year 3.

Changes in the estimated cost base over time will be different from changes in vehicle numbers and fuel use. This is illustrated above where the cost base expands more rapidly (measured as a percentage change) than either the number of registered vehicles or fuel consumption. Where this is the case, the following outcomes are likely to occur:

- Actual revenue in year 3 will usually be higher than the expected revenue calculated at the time the charges are set. This is because expected revenue is calculated based on vehicle numbers and fuel consumption in year 1 since this is the latest available information when charges are set.
- Where the cost base expands rapidly it is possible that actual revenue in year 3 is lower than the cost base would be for that year.
- Over time, revenue will 'catch up' to the cost base during periods where the cost base grows more slowly than the combined revenue base of fuel consumption and vehicle numbers.
- Even under a worst-case scenario where growth in the cost base permanently outpaces the combined growth in fuel consumption and vehicle numbers, the outcome is that the growth in revenue will lag the growth in the cost base. However, in the long run, total

revenue will exceed total expenditure due to the revenue uplift provided by the growth in fuel consumption and vehicle numbers.

The only effective way to eliminate circumstances where there is a delay in collecting the appropriate level of revenue (to match the actual cost base) would be to set charges based on an FLCB derived from forecast expenditure. While adopting an FLCB would be desirable for several reasons, this is out of scope for this determination. An FLCB is part of the reforms being considered under HVRR.

2.2.9 Decoupling of charges from the PAYGO model

Heavy vehicle charges have not been set to fully recover the heavy vehicle cost base since 2014–15. Since then, there have been some fixed percentage annual adjustments, revenue freezes and charges freezes. Most recently, in March 2021, ITMM decided to increase heavy vehicle charges for 2021–22 by 2.5 per cent.

There have been several reasons why charges have not been set to accurately recover the heavy vehicle cost base including:

- an inability of governments to support continued investment in the road network if heavy vehicle charges were to reduce at times where charges revenue exceeded the heavy vehicle cost base
- recognition that a number of heavy vehicle operators find it difficult to pass on increases in heavy vehicle charges to their customers
- consideration of adverse economic conditions including fires and drought
- the impact of the COVID-19 pandemic on the economy.

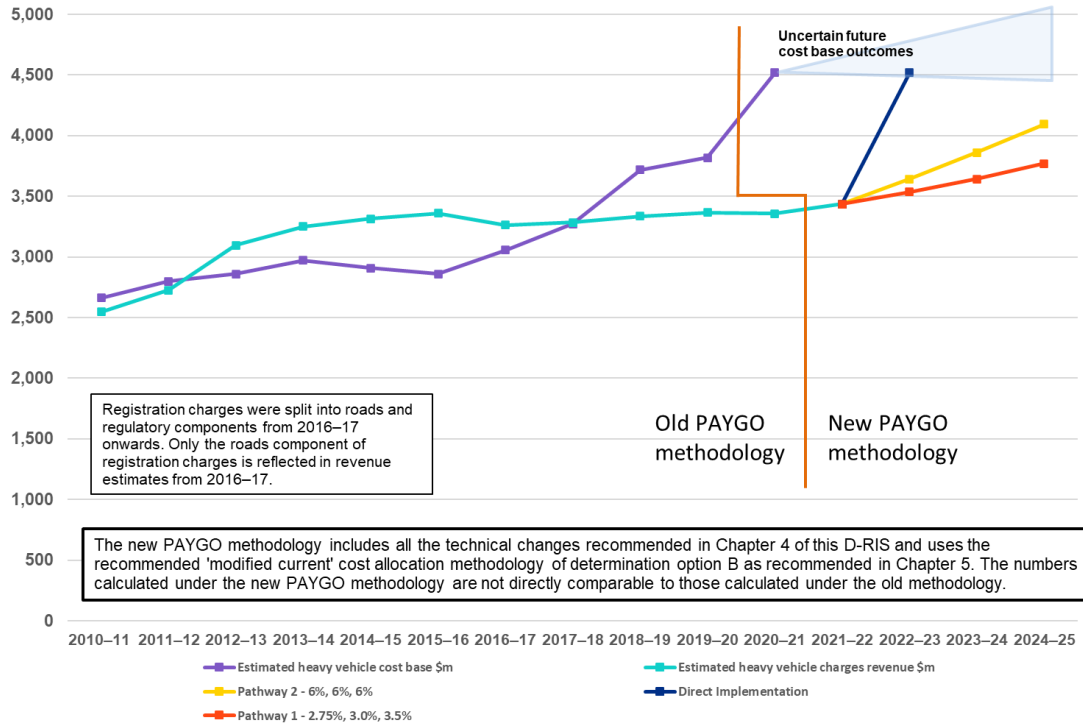
Industry has further highlighted that the predictability of changes to heavy vehicle charges is important to allow operators to plan and to reflect cost changes in their pricing and contracts.

These frequent departures from full cost recovery have led to both over- and under-recovery of heavy vehicle costs over time. This is shown in Figure 4. It is important to note that there is a two-year lag between cost base measurement and the implementation of heavy vehicle charges as outlined in section 2.2.8 and shown in Figure 3.

Therefore, one would not expect the cost base and estimated revenue to be the same in any year. Instead, if charges were accurately set to fully recover the identified cost base, one would expect the two lines to be similarly shaped, but with a two-year lag.

The graph in Figure 4 shows the growing gap between the heavy vehicle cost base and revenue from heavy vehicle charges, and the expected future revenue under the three implementation options explored in this D-RIS.

Figure 4. Heavy vehicle cost base and estimated revenue (\$m)



One of the objectives of this determination is to provide a reasonable path towards re-establishing full cost recovery over time, in accordance with the pricing principles.

3 Context

The determination focuses on making recommendations for heavy vehicle charges within the applicable scope, and in accordance with the pricing principles.

While it is not within the realm of the determination to address broader issues, the recommendations of the determination recognise the reality of the broader issues affecting the heavy vehicle sector now and that are likely to continue into the foreseeable future. Therefore, the recommendations offered in the determination are considered reasonable given the broader Australian context. This section outlines the broader Australian context as it existed at the time of drafting this D-RIS.

The context for the determination includes the following:

- economic conditions, including the effect of COVID-19 on the broader economy and the operating environment of heavy vehicle operators
- government finances and plans for expenditure on road infrastructure
- the potential for HVRR to replace the PAYGO methodology in the future – the determination seeks to provide a platform for implementing future reform
- changes in the heavy vehicle fleet including the emergence of electric and alternative fuel vehicles, and the possible emergence of greater vehicle automation over time.

These themes are addressed in more detail below.

3.1 Economic conditions

The overall economic climate of Australia has been adversely affected by the COVID-19 global pandemic. At the time of writing this D-RIS, the pandemic was still globally active, meaning that economic conditions are expected to be challenging for the foreseeable future. The 2021–22 Federal Budget noted that ‘while the outlook is more positive, we are still in the midst of a once-in-a-century pandemic. There is still uncertainty around. The global economic recovery is fragile and expected to be uneven across different economies highlighted by a double-dip recession in the euro’ (Australian Government, 2021).

The options identified in this D-RIS have taken into consideration the pandemic-induced fall in economic growth in Australia and the resulting economic impact for the heavy vehicle industry. This consideration has limited approaches that could be considered viable for both a charges framework and cost recovery measures to address the current difference between the revenue provided by heavy vehicle charges and the identified heavy vehicle cost base.

3.2 Government finances and infrastructure expenditure

Governments have increased expenditure on infrastructure generally, and on road infrastructure specifically in recent years. For example, total allocable road expenditure by governments has increased from \$13.1 billion in 2012–13 to \$20.6b in 2020–21.² At the

² These allocable road expenditure figures are based on the seven-year exponential moving average and are in effect the ‘total cost base’ in the PAYGO model that is to be allocated between heavy and light vehicles for the purposes of calculating heavy vehicle charges for 2014–15 and 2022–23, respectively.

same time, the additional expenditure and lower receipts associated with the COVID-19 global pandemic have led to deteriorating government financial positions. For example, the Commonwealth Government's budget strategy and outlook for the 2021–22 budget shows that increasing public debt levels are expected to persist for several years (Australian Government, 2021).

This highlights the need for this determination to acknowledge the contribution that heavy vehicle charges make to government revenues, and the contribution they can make towards governments' overall fiscal position.

3.3 Heavy Vehicle Road Reform project

Australian governments are working together to progress HVRR. This work is being overseen by transport and infrastructure ministers. If implemented, these reforms would replace the current PAYGO system for setting heavy vehicle charges.

HVRR aims to achieve productivity gains, improve roads for all users, and put in place an assured funding stream to allow road managers to maximise benefits from the existing road network. This is in the context of a burgeoning freight task and plateauing industry productivity.

Transport ministers have directed officials to prepare advice on heavy vehicle supply-side reforms. The reform elements include:

- infrastructure and transport ministers to set national service-level standards for roads to guide road expenditure decisions
- an independent body to review state and territory government road expenditure decisions
- an independent body to set heavy vehicle charges
- all governments to dedicate (hypothecate) revenue from heavy vehicle charges to road expenditure.

Of these elements, transport ministers have agreed to develop the service-level standard framework, but no decision has been taken on other supply-side reform elements. It is expected that further decisions on HVRR will be made at the December 2021 ITMM.

Further information on HVRR can be found under <https://www.infrastructure.gov.au/roads/heavy/>.

The key implications for this determination are that it needs to continue as the mechanism for setting heavy vehicle charges until HVRR is implemented. It must do this in a way that is compatible with future reform and provides a suitable platform for possible future reform implementation.

The timing of reform implementation is uncertain. Therefore, this determination needs to provide flexibility for reforms to be implemented in the future.

3.4 Heavy vehicle fleet and industry trends

Based on road use data sourced from the SMVU and state/territory registration authority fleet data, the following changes have occurred in the past seven years since the last determination:

- The heavy vehicle fleet has grown more slowly than the light vehicle sector, with heavy vehicle registrations up by 10 per cent over the period compared with 14 per cent for light vehicles. The growth in the light vehicle fleet has been led by light commercial vehicles, whose registrations are up by 28 per cent.
- Within the heavy vehicle sector, vehicle population growth has been largely focused on the truck-and-dog rigid combinations with a gross combination mass (GCM) over 42.5 tonnes up by 28 per cent and B-double combinations up by 32 per cent. Other heavy vehicle types where the number of vehicles is rising strongly are 4-axle rigids over 25 tonnes GVM with no trailer up 68 per cent and single-trailer articulated trucks over six axles more than doubling.
- Total VKT by both the heavy vehicle and light vehicle sectors have increased by 7 per cent over the past seven years. In the most recent year, light vehicle VKT fell by 7 per cent due to the impact of COVID-19 on travel, but heavy vehicle VKT was up by 2.5 per cent. The annual average distance travelled by heavy vehicles reduced by 3 per cent over the past seven years. Growth in total VKT was strongest in those vehicle classes with high population growth, with truck-and-dog rigid combinations over 42.5 tonnes up by 33 per cent, 9-axle B-doubles up 29 per cent, 4-axle rigid trucks over 25 tonnes GVM up by 83 per cent and single-trailer articulated trucks over six axles more than doubling.
- The average fuel efficiency of heavy vehicles has improved since the last determination, with fuel use per 100 kilometres of travel reduced by 2 per cent. Light vehicles overall experienced a fall of 0.7 per cent over the same period. Both the truck-and-dog rigid combinations over 42.5 tonnes and 9-axle B-doubles achieved fuel efficiency gains of 5 and 8 per cent respectively over the period.
- Average tonne kilometres by the heavy vehicle sector rose by 13 per cent during the period, with truck-and-dog rigid combination tonne kilometres up by 30 per cent and 9-axle B-double tonne kilometres up by 26 per cent. Average gross mass (AGM) across the entire heavy vehicle fleet was up by 6 per cent over the period, which indicates the fleet is getting heavier over time as operators and their customers look to gain greater efficiencies by operating trucks and heavy vehicle combinations that have a truck and trailer combination (whether it be a rigid truck combination or an articulated truck combination) being able to haul heavier loads.
- Recent years have seen the emergence of alternative fuels for light vehicles with electric-only and hybrid electric/petrol vehicles. However, so far this is yet to materialise in the heavy vehicle market. A total of 153 electric or hybrid electric heavy vehicles are currently identified by registration authorities, out of a total of half a million heavy vehicles registered nationwide. Over 99 per cent of heavy vehicles use diesel, with most of the remainder being compressed natural gas used in buses.
- The significance of these trends is that the heavy vehicle fleet is continuing to improve its fuel efficiency and productive efficiency in carrying heavier loads on average but with less fuel required. This results in fewer heavy vehicles being required for a given national freight task and results in less environmental and congestion impacts than otherwise would occur.
- In terms of national heavy vehicle charging, these trends mean there will be relative shifts in the share of national road expenditure allocated to the light vehicle sector versus the heavy vehicle sector and with relative road expenditure allocated between heavy vehicle

classes, as some vehicle classes increase in significance relative to others. The fall-off in light vehicle travel over the past year due to COVID-19 (and the heavy vehicle travel continuing to grow) means the heavy vehicle sector attracts a greater share of overall road expenditure that needs to be covered by a higher level of heavy vehicle charges than would otherwise occur.

3.4.1 Operating costs

HoustonKemp consultants were contracted to update the vehicle operating cost model. The update was conducted in consultation with key industry stakeholders. The key updates compared with the model produced in 2013 were as follows:

- Labour costs have increased significantly because it reflects the most recent award wages and includes costs previously not considered in the previous model.
- Fuel costs have decreased because the pump price for diesel excluding fuel excise has declined.
- Vehicle and capital costs have remained largely the same because the increase in market prices and the inclusion of stamp duty have been largely offset by lower financing rates.
- The tyres/maintenance costs have increased significantly for some vehicle types (e.g. rigid vehicles and buses) to reflect costings in the Australian Transport Assessment and Planning guidelines and stakeholder feedback.
- Other costs have increased to cover costs previously not considered in the model – for example, compliance training, parking and tolls and the introduction of new technology such as electronic work diaries.

Analysis showing changes in operating costs for common vehicle classes is provided in section 6.6.3.

4 PAYGO model improvements

4.1 Overview

The NTC has considered a range of issues as part of this determination. During initial consultations and as part of the formal consultation process for the C-RIS, the NTC assessed issues for their value in supporting an accurate determination of heavy vehicle charges. Broadly, these fall into the following categories:

- no changes to be made – generally because either there was no material basis for a change to be made or the issue is being addressed under HVRR
- improvements to the PAYGO model are recommended – generally due to technical and/or non-controversial changes being made, including due to updated data
- options parameters – where changes are potentially justified but are of a more contestable nature and therefore warrant deeper assessment as a core focus of the options assessed in this D-RIS.

These issues and their assessment are summarised in Table 3.

Table 3. Summary of model improvements considered

Section	Topic	Summary of recommended approach
Road expenditure		
4.2	Trust in expenditure data	Consider the feasibility of amending the expenditure template requirements to include a confirmation that significant projects included in submitted expenditure were subject to third party review (e.g. Infrastructure Australia, state-based infrastructure body, Treasury) as per current requirements. No further changes recommended because there is no cost-effective mechanism to address the issue has been identified. This issue will be better addressed as part of HVRR.
4.3	Expenditure categories	No change recommended because there is no clear advantage to changing expenditure categories under PAYGO and there is no certainty on the categories that would be used under HVRR. However, the NTC recommends exploring the option of adopting new expenditure categories in PAYGO once new expenditure categories under HVRR have been agreed.
4.4	Treatment of innovative funding and financing models	Treatment on a net-neutral basis in accordance with broad principles recommended. However, the modelled numbers in this D-RIS do not include jurisdictions' reported expenditure on innovative funding and financing in 2020–21 due to some concerns about the quality/completeness of data provided for this year (the first year for which such data has been collected). Therefore, this will need to be implemented after this determination.
Input data and assumptions		
4.5	Usage data	Ensuring ongoing availability of usage data identified as an important issue. The NTC to develop and recommend alternative sources in the future. As a first option, the NTC recommends that

Section	Topic	Summary of recommended approach
		it should explore addressing the issue through the current work being undertaken by the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications.
4.6	Review of ESA values	Use of new, updated ESA values recommended.
4.7	Cost allocation	Recommendation to build determination alternatives around three different options for the cost allocation matrix. These options are explored in detail in chapter 5.
Modelling approach and adjustments		
4.8	MaxMan	Removal of MaxMan recommended.
4.9	RUC leakages	Recommendation that fuel usage be adjusted for leakages using conservative estimate of 4 per cent, based on ATO fair and reasonable rates.
4.10	Unsealed road travel discounts	Recommendation to continue the current approach until better information on travel on unsealed roads can be obtained. The NTC to investigate possible data sources after the determination.
4.11	Community service obligations discount	Removal recommended because this has minimal impact in practice.
4.12	Heavy vehicle concessions	No changes recommended as part of this determination. Separate process recommended for states and territories to review and harmonise, where possible.
4.13	Electric vehicle fleet	No action recommended as part of this determination. Regular reporting and monitoring recommended.
Recovery of regulatory costs		
4.14	Recovery of regulatory costs	Recalculate the regulatory component of registration charges using the current formula, updated usage data and the current approved NHVR budget. Introduce an automatic process in model law to adjust the regulatory component of registration charges from year to year. The NTC to publish indicative regulatory components of registration charges on its website for the proposed three-year price period.

The following sections provide a detailed analysis for each topic, outlining the issue and possible options before presenting a recommended approach.

4.2 Trust in expenditure data

4.2.1 Background

A relative lack of trust by industry in the expenditure data submitted by states and territories and its allocation to PAYGO cost categories has been a persistent issue across previous determinations.

As part of the previous determination, the NTC commissioned a review conducted by EY to develop a possible audit program designed to check the accuracy of expenditure data submitted by jurisdictions.

The scope of this work included:

- identifying key risk areas associated with preparing NTC road construction and maintenance data
- developing audit design options to address key risks
- designing a range of audit options to assist the NTC in increasing stakeholder confidence on the accuracy, consistency and categorisation of the reported expenditure.

The report provided a range of options for an audit program. These options were assessed by the level of confidence provided and the cost of implementation, as outlined in Table 4.

Table 4. Audit program options

Audit option	Description	Level of confidence	External cost estimate
Option 1: Status quo with CEO attestation, increased guidance from improved guidelines and expenditure template	Improve the expenditure template and guidelines to help achieve consistent application across all jurisdictions. A sign-off statement should be provided by each organisation's CEO or equivalent when lodging the NTC expenditure template.	Low	There would be no audit fee paid to external parties.
Option 2: Analytical review for reasonableness	Perform a high-level analytical assessment of the expenditure data reported by each jurisdiction to identify variances and trends including a comparison between jurisdictions.	Low	The cost paid to external parties to implement this audit was estimated as \$30–35k across all jurisdictions.
Option 3: Desktop audit examining key inputs and assumptions	Each jurisdiction to provide documentation to support the expenditure data it has reported in the NTC expenditure template using a standard format prescribed by the NTC. The auditor performs a desktop review of all data provided on a line-by-line basis to confirm the calculation has been executed in accordance with the NTC's instructions and the source appears appropriate.	Medium	The cost paid to external parties to implement this audit was estimated as \$60–65k across all jurisdictions.

Audit option	Description	Level of confidence	External cost estimate
Option 4: Site visit with detailed testing	A team of auditors will comprehensively examine the data inputs and calculation of figures reported in the NTC's expenditure template. Key controls governing the template population process will be identified and tested on a sample basis. A sample of transactions will be traced from the template to each jurisdiction's finance system and through to source input information. Manual calculations will be re-performed to confirm accuracy and reviewed for consistency with the intent of the guidelines.	High	The cost paid to external parties to implement this audit was estimated as \$115–125k across all jurisdictions.
Option 5: Expenditure data checked by each jurisdiction's external auditor or other third-party auditor	Jurisdictions are to include the expenditure data reported to the NTC as an additional note disclosure to its annual financial statements. Jurisdiction external auditors will assess the material accuracy of reported expenditure data as part of their annual financial statement audits.	High	The cost paid to external parties to implement this audit was estimated as \$185–200k across all jurisdictions.

Option 1, which was to retain the status quo, was implemented as part of the 2014 determination with the addition of a CEO (or delegate) sign-off statement now supplied annually to the NTC together with the PAYGO expenditure data.

The options in Table 4 were again presented to the industry and governments as part of the workshops prior to the C-RIS:

- While industry retains a desire for increased transparency of expenditure reporting, they expressed an unwillingness to pay for an expensive auditing regime.
- Governments suggested that the options presented may not provide much greater transparency, despite the cost, given the range of skills and knowledge that is necessary for expenditure allocation.

4.2.2 Summary of submissions

Only the Australian Trucking Association (ATA) commented specifically on this issue. The ATA noted that its concerns about the PAYGO expenditure inputs go beyond auditing or reviewing the data. It stated that PAYGO is entirely driven by governments' spending decisions and requires heavy vehicle operators to pay an outsize share of the cost of road investments that are not freight priorities, and higher costs due to inadequate project assessment and selection.

The ATA proposed that the NTC expenditure template should be amended to require each organisation's CEO or equivalent to certify that the major projects included in categories F1, F2 and F3 have been endorsed by an independent infrastructure agency; are based on integrated transport planning, including trucking industry and community consultation; and include rest areas and access improvements in project planning and delivery.

4.2.3 Conclusion and recommendations

The NTC acknowledges that there continue to be concerns about the quality of expenditure data used in the PAYGO model. The ATA's recommendations could be a low-cost option to provide reassurance around the process surrounding major projects included in select expenditure categories.

While the NTC still proposes to make no changes to expenditure auditing at this time, it is proposed that the NTC investigates the feasibility of including additional certification similar to that proposed by the ATA in the future.

The NTC also considers that additional mechanisms for greater transparency could be considered under HVRR, specifically in the proposed responsibilities of the organisations tasked with implementing an FLCB model under an independent price regulator. We will inform the Land Transport Market Reform Steering Group of the feedback we have received.

The NTC recommends that:

- there be no change to expenditure auditing at this time
- the NTC investigates whether additional certification requirements similar to those recommended by the ATA could be introduced at reasonable cost in the future.

4.3 Expenditure categories

4.3.1 Background

Road expenditure is entered into the PAYGO model in different expenditure categories. This allows for a different allocation of costs to heavy vehicles and light vehicles depending on the nature of the expenditure and the degree to which it is affected by different cost drivers. Cost allocation is discussed further in section 4.7.

Over recent years, the NTC has been working on a prototype FLCB model in support of HVRR. As part of this work, Opus (now WSP) developed a set of expenditure categories for the NTC to use in the prototype FLCB model (Opus, 2017). The NTC has since made some modifications to those expenditure categories in the prototype FLCB model, based on feedback from road agencies and research completed under Austroads' *AAM2102 Guidelines for minimum levels of asset componentisation* project (Austroads, 2018).

The key considerations in developing the prototype FLCB asset/expenditure categories included:

- separating expenditure by combined work categories, namely capital expenditure (including upgrade, development and renewal) and operating expenditure (including operating and maintenance) – this is important in a lifecycle FLCB model (or building block model) because capital expenditure is recovered over the entire life of the asset, in contrast to operating expenditure which, similar to PAYGO, is recovered as it is incurred
- separating asset/expenditure categories with different asset lives to allow for recovery of costs over the asset's economic lifetime to be modelled more appropriately
- separating expenditure categories based on the degree to which heavy vehicles drive the road wear or construction requirements (similar to the approach for PAYGO)
- applying a materiality test to avoid having an excessive number of asset/expenditure categories; for example, there may be categories that road agencies do not collect data

for (and will continue not to in the future) and/or others that may have a very low collective asset value.

4.3.2 Analysis

Although the prototype FLCB model itself is out of scope for this determination, the NTC considered the option of using its expenditure categories for the purposes of the PAYGO model in this determination. The NTC has analysed the potential advantages and disadvantages of using the existing PAYGO expenditure categories or changing to the prototype FLCB expenditure categories in Table 5.

Table 5. Advantages and disadvantages of using PAYGO or FLCB categories

	Advantages	Disadvantages
PAYGO categories	<p>Existing and established process.</p> <p>Avoids any uncertainty about the accuracy of data provided in any alternative expenditure categories.</p>	<p>State and territory road agencies may incur some additional administrative costs if the prototype FLCB model expenditure data continues to be provided alongside the PAYGO data in the coming years. That is, under this option road agencies would continue to provide two datasets rather than one (assuming the NTC continues to request data for the prototype FLCB model in the coming years).</p>
FLCB categories	<p>Potential to reduce some administrative costs if only one dataset (for the FLCB model) were to be provided by road agencies in the coming years.³</p> <p>Potentially begins the transition towards a future use of FLCB expenditure categories under HVRR.</p>	<p>It is not certain that any future FLCB model that may be used under HVRR would use the exact expenditure categories used by the NTC for the prototype FLCB model (which would be the basis under which the NTC would request data under this option).</p> <p>Road agencies would need to provide seven years of historical data in order to operate the PAYGO model's exponential moving average. This would be likely to more than offset any administrative cost savings for road agencies for the next few years that could arise from providing only one dataset under this option.</p> <p>There would also be administrative costs incurred by the NTC in significantly redesigning the PAYGO model to reflect the new, larger number of expenditure categories.</p> <p>The split into capital expenditure and operating expenditure in the FLCB categories is irrelevant for the PAYGO model, which treats both types of expenditure in the same way.</p> <p>It would require new cost allocators, albeit these could be based on those currently used in the NTC's prototype FLCB model. However, the cost allocators currently used in the prototype FLCB model are based on a best-effort translation of the PAYGO cost allocators, and therefore they have not been subject to any significant testing or review of appropriateness and accuracy.</p>

³ This potential reduction assumes that the NTC would continue to request data for the prototype FLCB model.

4.3.3 Summary of submissions

Most submitters agreed with the NTC's recommendation to retain the existing PAYGO expenditure categories. However, in informal discussions, a stakeholder suggested that a transition to new expenditure categories could be considered if and when these have been agreed under HVRR.

4.3.4 Conclusion and recommendations

Based on the analysis in Table 5, the NTC recommends that:

- the existing PAYGO expenditure categories be retained
- the option of introducing new expenditure categories should be explored once a new set of expenditure categories is agreed under HVRR.

4.4 Treatment of innovative funding and financing methods

4.4.1 Background

A 2016 report from the Bureau of Infrastructure, Transport and Regional Economics (BITRE, 2016) noted there were 16 toll roads in Australia. Since that time, the Toowoomba Bypass has opened in Queensland, new toll roads have opened in Sydney and more new toll roads are expected to open in the coming years.

Increasingly, governments are using innovative financing and funding methods in partnership with private enterprises to deliver new roads, bridges and tunnels, and to maintain them. There is no single PPP model that has emerged as the dominant, or preferred, financing and funding model. In fact, recent PPPs are becoming more diverse and complex. For example, the CityLink–Tullamarine widening project and West Gate Tunnel projects in Melbourne are being funded at least partially by tolls, and by amending existing tolling arrangements on other roads owned by the private sector entity undertaking the project (Transurban, 2015; 2020).

Toll roads generate revenues that help pay for their construction and ongoing maintenance. Under PAYGO, expenditure relating to tolled roads has historically been excluded from the cost base on the basis that the costs of these roads were already recovered through tolls.⁴ This treatment is likely to be appropriate where all of a road's costs are funded by the toll revenue (regardless of whether the road is owned by the private sector or government). Under any future price-setting mechanism, whether PAYGO or an FLCB, this is also expected to be the case.

For fully tolled roads, as described in the previous paragraph, the case is straightforward. However, in practice, there is a growing variety of PPP approaches to road provision that differ in how planning, funding/investment, operation, maintenance and ownership are allocated between government and private partners over time. This adds complexity to how road costs and revenues should be treated, and this workstream aims to address the potential deficiency in the current PAYGO guidelines regarding the treatment of these innovative financing and funding models.

⁴ The NTC's expenditure template guidelines state: 'All road expenditure related to roads where a toll applies or other source of direct charge applies to use of the road should not be included in reported expenditure'.

The increasing prevalence and complexity of these innovative financing and funding models in the roads sector demonstrate a need to reconsider how these models are treated under the PAYGO system. As part of our FLCB program of work in previous years, the NTC identified several principles and approaches for dealing with these innovative financing and funding models, and the current workstream builds on that work.

The objective of this workstream is to identify a methodology for treating PPPs, toll roads and other innovative financing approaches in a pragmatic and non-distortionary way. Any proposed treatment under PAYGO should ideally not distort government decisions and should be based on available and identifiable information.

4.4.2 Issues

The following points outline the problem to be addressed in this workstream:

- The PAYGO system aims to recover government expenditure on roads that is not funded through other sources of revenue (e.g. insurance or disaster relief money).
- Government road procurement processes and funding/financing models have changed over the past 20 years and are continuously evolving. The current expenditure guidelines were developed during a different era of government road procurement and may not appropriately reflect developments since that time.
- The current PAYGO expenditure guidelines may lead to relevant government expenditure not being reported and government revenue sources not being adequately removed from reported expenditure (and therefore the cost base). As a result, the current expenditure guidelines could lead to an incorrect measurement of the heavy vehicle cost base, and therefore incorrect heavy vehicle charges, if they remain unchanged.

4.4.3 Analysis

Under the current PAYGO approach, expenditure relating to tolled roads is excluded from the cost base on the basis that the costs of these roads were already recovered through tolls. This treatment is appropriate where all of a road's costs are funded by the toll revenue (regardless of whether the road is owned by the private sector or government).

In practice, however, governments may make contributions to toll roads in a variety of ways, and toll revenue may not adequately recover the costs borne by the government or private sector for building, operating and maintaining the road. For example, a government may own a road that is tolled but could potentially choose to levy tolls at a level where the road's costs are not fully recovered through tolls. Even where a private sector entity has a concession to levy tolls, governments may choose to make grants, loans or other payments to the private sector entity to help ensure the viability of a project where expected future toll revenue may be perceived to be inadequate.

Both of the above are examples of where the toll is in effect a 'partial toll', since the arrangements are not achieving full cost recovery from the users of that road and the government is making up the shortfall of revenue. There is an argument that, in principle, governments should recover these costs from road users on the wider road network, since the tolls are not achieving cost recovery (as anticipated by the PAYGO expenditure guidelines).

Although governments may make contributions to toll roads to help ensure their viability, they may also receive revenues from alternative road-related sources. For example, governments may receive tolls on certain government-owned roads. Another potential model is where a government may receive any toll revenue raised on a road and, in return, make

availability payments⁵ to a private sector participant, in effect meaning the government bears any risks relating to traffic demand levels or toll collection for that project. Apart from potentially receiving revenue from toll roads, governments may also raise revenue through other sources such as value capture⁶ and asset recycling.⁷ In addition to these funding sources, governments may receive ‘gifted’/contributed assets (e.g. as part of new developments) that the government is then responsible for maintaining and operating on an ongoing basis.

The current road charging system is designed to recover the costs of roads from road users – at present from heavy vehicles only but in the future potentially including light vehicles. The additional sources of funds and assets outlined in the previous paragraph need to be considered so the funding necessary to recover the identified cost of roads is not recovered more than once. That is, if a road has already been funded through another funding source (e.g. toll road users, taxpayers or developers) its costs should not then be recovered from road users.

This workstream is primarily concerned with achieving adequate funding of roads, having regard to the increasingly diverse methods of financing and funding roads, and the diversity of entities involved in the construction and management of roads. As the Productivity Commission noted in its 2014 Public Infrastructure inquiry report, road funding ultimately must come from road users/beneficiaries or governments (which effectively means either current taxpayers or, if the government chooses to borrow funds, future taxpayers) (Productivity Commission, 2014, p. 142).

The current heavy vehicle charging system is designed to recover identified costs in the PAYGO model from the relevant road users (heavy vehicles). Although revenue raised through tolling or value capture could be perceived as achieving a number of possible goals – including potentially addressing externalities such as congestion or noise – the NTC proposes (for the purpose of this analysis) to simply treat revenue raised through these innovative funding methods as being for the purpose of cost recovery.

In considering the various innovative financing and funding methods for roads, we have established high-level principles for their application in a pricing context as described in section 4.4.4.

4.4.4 Proposed principles for innovative funding and financing

The NTC’s proposed high-level principles are:

1. The principal aim is to achieve cost recovery.
2. All costs incurred by road agencies in building, maintaining and operating the road network for providing road services should be included in the cost base.

⁵ The Productivity Commission’s 2014 Public Infrastructure inquiry report describes availability payments as: ‘the government making payments to a private provider which are not linked to service utilisation or patronage levels, but some other ‘service based’ metrics determined by government’ (Productivity Commission, 2014, p. 240).

⁶ The Productivity Commission’s 2014 Public Infrastructure inquiry report identified four possible methods of value capture: betterment levies; tax increment financing; hypothecation of tax increments to an infrastructure fund; and property development (Productivity Commission, 2014).

⁷ Asset recycling involves governments raising revenue from privatising existing infrastructure and hypothecating it to invest in new infrastructure.

3. All revenue received by governments through tolls or other charges (or from value capture) on assets used to provide road services should be counted against the cost base.
4. The treatment of PPPs and toll roads should not distort government decisions on financing and funding road infrastructure.
5. Where necessary, pragmatic, implementable solutions that build on available information should be used (with the view that some aspects may need to be revisited in the future).

We note that certain PPP/toll road projects will be unique, meaning that despite the proposed high-level principles, the treatment of these projects for modelling purposes may need to be assessed on a case-by-case basis.

4.4.5 Potential options for treating innovative funding and financing

The previous section outlined some of the potential principles and treatments for innovative financing and funding models that governments may use in the roads sector. However, there is a choice to be made about whether and how much to change the current treatment of innovative financing and funding models under PAYGO. Table 6 outlines several options and the advantages and disadvantages of each.

Table 6. Treatment approaches for innovative funding and financing

Option	Advantages	Disadvantages
1. Status quo (leave expenditure guidelines unchanged)	Simple approach, with no costs/effort incurred by road agencies to change current processes. The current PAYGO system may not be in place for much longer, so this would avoid incurring any unnecessary costs.	Guidelines do not allow reporting of genuine government costs on roads that are tolled, potentially leading to an incorrect measurement of the cost base and a potential inconsistency with cost recovery principles. Greater prevalence of toll roads and other innovative funding/financing approaches over time may mean cost base measurement becomes increasingly inaccurate or unrepresentative under the current expenditure guidelines.
2. Change guidelines to require reporting of government expenditure on roads that are tolled but do not require any toll revenue received by governments to be reported	Allows for more accurate reporting of all costs relating to roads that are incurred by governments (relative to status quo).	Does not take into account road-related revenue received by governments through toll roads or other innovative funding or financing models, potentially creating inconsistencies in the treatment of these roads/projects. ⁸ Unlikely to be consistent with cost recovery principles. Potential for a minor increase in administrative costs and effort for some road agencies to report this data (relative to the status quo).
3. Change guidelines to require reporting of	Allows for more accurate reporting of	Does not take into account road-related expenditure by governments on tolled roads or

⁸ The inconsistency arises because the current exclusion of toll roads from the cost base is on the basis that the revenue fully funds the relevant costs. Adding the costs but not offsetting them with any revenue received would overstate governments' true net cost.

Option	Advantages	Disadvantages
government revenue from roads that are tolled but do not require any expenditure on these roads to be reported	road-related revenue received by governments (relative to the status quo).	any other innovative funding or financing models used by governments, potentially creating inconsistencies. ⁹ Also, it is unlikely to be consistent with cost recovery principles. Potential for a minor increase in administrative costs and effort for some road agencies to report this data (relative to the status quo).
4. Change guidelines to allow reporting of government expenditure on tolled roads but also require government revenue from tolls to be reported	Option would correctly capture governments' net costs relating to toll roads and allow them to be treated in an internally consistent manner.	Does not take into account other models of innovative funding and financing that may be used by governments. Potential for a minor increase in administrative costs and effort for some road agencies to report this data (relative to the status quo).
5. Change guidelines to properly account for tolled roads and any other types of innovative funding or financing models used by governments that change the timing or nature of expenditure incurred or revenues received by governments (Intended treatment would be to ensure that any net road-related costs incurred by governments would be included in the cost base)	Most consistent with intent of PAYGO cost recovery system, and the cost recovery principle, because it would capture all net road-related costs incurred by governments regardless of the financing/funding model used. Potentially more consistent with the expenditure policies that would be applied under possible future developments in HVRR (e.g. an independent price regulator and FLCB model).	Some types of innovative funding and financing will be difficult to foresee and/or develop detailed guidance for ahead of time. This may require assessment on a case-by-case basis as to whether the relevant expenditure or revenue is appropriate for inclusion. Potential for a minor increase in administrative costs and effort for some road agencies to report this data (relative to the status quo). This option is likely to have the highest administrative costs of all the options.

At a stakeholder workshop on this topic in August 2020, some government stakeholders supported amending the expenditure guidelines. Industry stakeholders expressed the following views:

- the need for toll roads to be declared under Part IIIA of the *Competition and Consumer Act 2010*
- the level of tolls charged, including the relative amounts paid by trucks (or commercial vehicles) relative to light vehicles, and the need for tolls to reflect cost savings to users

⁹ The inconsistency arises because the current exclusion of toll roads from the cost base is on the basis that the revenue fully funds the relevant costs. Subtracting the revenue received but not considering any government costs incurred would understate governments' true net cost.

- that governments should not charge industry for roads that trucks cannot use (except when accessing a local destination only accessible using that road), such as Pennant Hills Road in New South Wales.

The NTC notes that the first two points above are outside the scope of this determination. The third point is something that could potentially be addressed if the expenditure on the relevant types of roads were by state or territory governments.¹⁰ This could potentially be achieved by amending the PAYGO expenditure guidelines to specify that states and territories should not include this type of expenditure. There is a question as to whether it would be feasible for states and territories to consistently exclude this expenditure. It is also likely that the amount of expenditure that would be excluded would be minor.

4.4.6 Summary of submissions

There were five submissions on innovative funding and financing treatment, from the Australian Logistics Council (ALC), the ATA, the Bus Industry Confederation (BIC), NatRoad and the NHVR. Three submitters (ALC, the BIC and the NHVR) supported changing the PAYGO guidelines in line with option 5 in Table 6, while the ATA and NatRoad were not in favour. The ATA submitted that this approach would ignore the existing tolls paid by heavy vehicles, which vastly exceed the marginal cost of their road wear, and could also result in light vehicle toll relief paid out of government revenue being inappropriately attributed to heavy vehicles. NatRoad expressed concern that it may be difficult to anticipate and develop guidance for certain types of projects and difficult to quantify the impact of this change in advance.

4.4.7 Conclusion and recommendations

Based on the evaluation presented in Table 6, the NTC retains its preferred option from the C-RIS to proceed with option 5 because it is consistent with the principle of full cost recovery and is flexible to allow the treatment to be tailored to individual projects if necessary. However, the NTC recommends a delayed implementation of this methodology, and the calculated cost bases under direct implementation in this D-RIS do not incorporate any costs or revenues from innovative funding and financing reported by jurisdictions for 2020–21.

This is primarily for two reasons. The first is a concern about the current quality/completeness of data. Two jurisdictions reported expenditure for innovative funding and financing totalling around \$1.47 billion; however, one of the jurisdictions reported no toll revenue (despite having government-owned toll roads in that jurisdiction), while the other provided no detail on what projects the expenditure was occurring on. Implementation of this change requires confidence in the quality of the data – which may require additional time and/or guidance from the NTC for road agencies to understand and correctly report these expenditures and revenues – and importantly requires that both government revenues and costs are reported accurately to ensure the correct ‘net costs’ to governments are calculated. Second, from a pragmatic perspective, the cost bases under direct implementation are likely to be difficult to implement (as discussed in chapter 6), even without the reported additional costs. Under a multi-year price path implementation option, this change would have no practical impact on charges over the pricing period.

¹⁰ The local government expenditure that is included in the PAYGO model is based on the ABS’s *Government finance statistics* publication. However, expenditure on local roads in the PAYGO model has a large percentage excluded from the cost base calculations – 75 per cent in urban areas and 50 per cent in rural areas – on the basis that local roads provide access and amenity benefits, and therefore costs should be recovered through other funding sources such as council rates.

Some other issues relating to this workstream were raised in submissions. First, the NTC acknowledges the ATA's concerns that toll relief for light vehicles should not be included in reported costs for innovative funding and financing expenditure. It was not the NTC's intention to capture this type of expenditure under the proposed changes, and none was reported by the relevant jurisdiction for 2020–21, but this can be specifically clarified in future versions of the expenditure guidelines to avoid any doubt. Second, the level of existing tolls paid by heavy vehicles on privately owned/operated roads is not in scope for this determination and is a matter determined under the relevant contractual terms between the government and the road's owner or operator.

Finally, the NTC does not recommend making changes to address the issue of jurisdictions excluding expenditure on roads that heavy vehicles are unable to use due to the presence of nearby toll roads. The NTC acknowledges the NHVR's submission that a potential example of such a road – Pennant Hills Road in NSW – only forbids certain types of heavy vehicles (rather than all heavy vehicle traffic). This fact would make implementation very challenging given that some heavy vehicles still benefit from using these roads (and drive costs on them). Submissions did not provide evidence of this being a widespread issue around the country. While there are some roads that are not accessible for heavy vehicles, expenditure on these roads is unlikely to have a material effect on the heavy vehicle cost base. Many of these roads are likely to be local roads where the current approach of excluding significant proportions of costs (as discussed in the footnote in section 4.4.5) already reduce the amount of relevant expenditure included in the cost base.

The NTC recommends that:

- the NTC should change the expenditure reporting guidelines to account for tolled roads and any other types of innovative funding or financing models used by governments on a net neutral basis (option 5) in accordance with the principles in section 4.4.4
- the NTC should work with state and territory road agencies to assist them in reporting the relevant expenditures and revenues in accordance with the guidelines and principles.

4.5 Usage data

Usage data in this D-RIS refers to data about vehicle use that is used in the PAYGO model as part of the cost allocation process.

4.5.1 Issues

The ABS has announced it will discontinue the SMVU after the 2020 SMVU is completed. The SMVU has been the NTC's only source of road use and fuel use data in the past, and no other source is readily available. The key reasons for discontinuing the SMVU are an ABS decision to focus on its core business of the National Accounts and the Census, as well as the \$2.6 million cost of undertaking the survey every two years.

The ABS also plans to discontinue the annual Motor Vehicle Census but not before it can be proven that the National Exchange of Vehicle and Driver Information System (NEVDIS) system can effectively provide an equivalent collection of the nation's motor vehicle population. The Motor Vehicle Census, or a NEVDIS equivalent, is essential for the continuation of the SMVU (or an equivalent) because it provides the national vehicle population totals by vehicle type for any survey outcomes to be projected up to the national level.

4.5.2 Description of the Survey of Motor Vehicle Use

Every two years, the ABS conducts the SMVU based on a random sample of 16,000 vehicle owners using either online or hard copy surveys. It is the only survey of national road use by vehicle type or vehicle combination, with data provided by state/territory across urban and rural areas and measures of interstate travel. The vehicle population frame for the SMVU is provided by the Motor Vehicle Census.

This survey is conducted over one financial year in three periods: July–October, November–February and March–June.

The sample of 16,000 vehicle owners is allocated into one of these three periods, with the results annualised. Survey questionnaires are provided at the start and end of each period so that data such as travel start/end odometer readings, fuel use, types of travel and average loads can be determined. The 2020 SMVU states that the survey sample consisted of passenger vehicles (18.0 per cent), motor cycles (5.0 per cent), freight vehicles (including light commercial, 65.9 per cent), buses (8.1 per cent) and non-freight carrying vehicles (3.0 per cent). The sample size chosen gives a suitable level of reliability for estimates of total distance travelled and tonne kilometres travelled for each state/territory of registration by type of vehicle category over the survey period.

At the national level, relative standard error (RSE)¹¹ results of less than 2 per cent are achieved with the 2020 SMVU having aggregate RSE results of 1.9 per cent for VKT, 0.69 per cent for vehicle in use numbers, 1.7 per cent for fuel use and 1.81 per cent for average tonne kilometres.

The SMVU provides disaggregated vehicle data to the NTC, with results for 40 vehicle classes: eight light vehicle classes and 32 heavy vehicle and vehicle combination classes.

4.5.3 Essential data provided by the Survey of Motor Vehicle Use

The following three datasets that only the SMVU provides are each essential for running and updating the PAYGO model:

- total distance travelled (VKT) by area of operation (urban and rural), by type of vehicle and by state/territory of registration
- total fuel consumed by area of operation (urban and rural), by type of vehicle and by state/territory of registration
- GTK by area of operation (urban and rural), by type of vehicle and by state/territory of registration. Although labelled GTK, this dataset measures average tonne kilometres and takes into account both loaded and unloaded travel.

¹¹ The RSE is a measure of the reliability of the data. The ABS notes the following about sampling error and the RSE:

'Estimates from the SMVU are based on information collected for a sample of registered motor vehicles, rather than all registered vehicles. The estimates may differ from those that would have been produced if all registered motor vehicles had been included in the survey. This difference is referred to as sampling error. One measure of sampling error is the Relative Standard Error (RSE), which indicates the extent to which a survey estimate is likely to deviate from the true population, expressed as a percentage of the estimate. Estimates with a RSE of 25% or greater are subject to high sampling error and should be used with caution ... It is important to consider the RSEs when using estimates produced from the SMVU as it affects the reliability of the estimates, and therefore the importance that can be placed on interpretations drawn from the data.' (ABS, 2020)

Discontinuing the SMVU after 2020 means the PAYGO model could become inoperable unless an alternative approach to source the essential usage data is found.

In addition to using the data outlined above to operate the PAYGO model, the NTC relies on other SMVU data for analysis:

- Three fuel-related datasets show total distance travelled, number of vehicles and type of fuel consumed by vehicle type and state of registration.
- The GVM/GCM dataset is used to assess the distribution of GVM/GCM by vehicle type compared with average values used in the PAYGO model.
- The two distance travelled distribution datasets show the distribution of total distance travelled and number of vehicles by type of vehicle and by state of registration.
- Two load level/reason datasets show a breakdown of loaded and unloaded travel by distance travelled and number of vehicles by vehicle type and state of registration.
- The by-business type dataset shows a breakdown of fleet use between hire and reward and own business ancillary by vehicle type and state of registration.

The vehicle population frame used by the NTC is collected directly from state/territory road authorities for the PAYGO model.

In the long run, it is possible that the information required to operate PAYGO or a similar methodology for setting heavy vehicle charges could be provided through telematics, possibly through a future electronic charging mechanism. It is unclear when or if this will become feasible. In the interim, the data currently produced by the SMVU will be needed to operate PAYGO or any similar pricing model based on forward-looking costs that is currently being considered under HVRR.

4.5.4 Possible interim approaches

Given the SMVU is crucial to the ongoing viability of PAYGO, and also provides important data for analytical purposes, it is likely that a short-term solution would involve contracting with a private or public organisation other than the ABS to undertake the SMVU or equivalent in future, noting that this will require an ongoing source of funding.

This approach presents an opportunity to expand or improve the survey to collect additional data that may be useful to governments generally.

There are several key steps to determine before investigating possible alternate providers:

1. Confirm which usage data would be required by the NTC (to operate PAYGO and conduct analysis) and other transport agencies and specify confidence levels required. This step would also include approaching other key users of this dataset to obtain their input and support.
2. Establish whether any usable road usage data is being collected currently by other organisations and could possibly be used instead of survey data.
3. Design guidelines as to what will be required in an alternate SMVU data collection to maintain continuity with the former SMVU across the key usage data fields that are used in PAYGO.
4. Specify how often updated data will be required. It will take time to establish an alternate collection and at this stage a collection covering the 2021–22 year would be required to

maintain continuity. However, it may be necessary to delay this to have time to confirm funding and to set up an alternate data collection process.

5. Participate and keep up to date with the Commonwealth Government's plans to establish a substitute for the SMVU.
 - BITRE obtained agreement with Austroads to run a NEVDIS count at the same time as the last ABS Motor Vehicle Census survey. This enabled a comparison that has determined that NEVDIS could be an alternate population frame.
 - NEVDIS in future will provide the same data to generate current Motor Vehicle Census table builder outputs down to the postcode level.
 - However, this would not provide usage data such as VKT, fuel use and GTK.
 - BITRE is also in the process of finalising a tender to explore the costs and feasibility of producing a replacement SMVU to be reported on early in 2022.
6. Determine a source of funding.
7. Establish what governance and legal provisions will be required for this data collection relating to privacy and confidentiality.
8. Establish how the outputs from this data collection are to be presented and made available.
9. Establish a list of potential providers and establish whether contracting for the required data provision is feasible.

4.5.5 Summary of submissions

A number of submissions commented on the importance of maintaining a comprehensive national road use dataset as has been provided in the past by the SMVU. For example, NatRoad commented that the NTC and/or government agencies should pay for the continuation of the SMVU and that a road use dataset like the SMVU will still be required under HVRR under an alternate system to PAYGO. The NHVR also said that the information capture cost of a replacement system should not be passed onto industry or be at minimal cost.

4.5.6 Conclusion and recommendations

Ensuring ongoing availability of usage data has been identified as an important issue. The NTC will need to find alternative data sources to be able to continue operating the PAYGO model. As a first option, the NTC will explore addressing the issue through the current work being undertaken by BITRE. If that approach looks unlikely to succeed, we will explore alternative options.

The NTC recommends that:

- the NTC should explore whether the current work undertaken by BITRE to replace the usage data previously sourced from the SMVU will provide suitable usage data for use in the PAYGO model
- the NTC should collaborate with BITRE to develop an alternative source of usage data, if possible
- the NTC should explore alternative options if it is unlikely that the current work undertaken by BITRE will provide the type of data needed to operate the PAYGO model within a suitable time frame.

4.6 Review of equivalent standard axle values

4.6.1 Issues

ESA values are a key cost allocator in the PAYGO model, particularly for heavy vehicles. ESA values measure deep road wear by vehicles, with heavy vehicles traditionally accounting for around 94 per cent of the ESA-kilometre (ESA-km) allocated cost in aggregate across the entire heavy vehicle fleet.

ESA is a non-dimensional measure of the relative pavement wear associated with different loads, axle groups and tyre configurations. The ESA for a particular vehicle is the sum of the ESA for each of the vehicle's axle groups. The ESA values used in the PAYGO model were last revised in 2013 for the 2014 heavy vehicle charges determination.

We undertook a review of a sample of five heavy vehicle classes in 2019. This found there had been enough change in ESA values for this sample of heavy vehicle classes to warrant a full review of ESA values for all heavy vehicle classes. This comprehensive review is now complete.

4.6.2 Approach

The approach used in this review is similar to that used in 2013. The calculations include the most recent available weigh-in-motion (WIM) data, which provides the basis for the ESA estimates for all heavy vehicle classes, except those that cannot be separately identified. A WIM device measures the dynamic axle weight of a moving vehicle to estimate the corresponding static axle weight. In Australia WIM devices are installed on selected roads to monitor the weights in practice that are occurring by axle group on the road surface. The WIM system works effectively to assess the effect of heavy vehicle traffic on the road network.

The NTC contracted Peko Traffic and Transport (PTT) to undertake the review. It analysed WIM data covering a three-year period from 2017 to 2019 for all states and territories except the Northern Territory, where WIM data is not available.

WIM data does not provide a means of distinguishing individual light vehicle classes because many different classes have a similar axle spacing. However, PTT calculated national estimates of the AGM and ESA values for PAYGO light vehicle classes using a 'first principles' approach, based on the kerb weight of the more popular makes and models.

PTT estimated national estimates of the AGM and ESA values for the PAYGO heavy vehicle categories based on 208 million 'clean' WIM records. The raw WIM data supplied by the state road authorities and Transmetric underwent a series of quality checks to identify and remove: out-of-scope records; records with partial or inconsistent data; records associated with equipment failure; and outliers. The latter were defined as records with an ESA value outside a band of ± 1.5 standard deviations from the initial state mean for each PAYGO vehicle class.

The 'clean' WIM records were then weighted to reflect the observed distribution in VKT reported in the SMVU. This step is required to minimise the potential for bias introduced by the non-uniform distribution of WIM sites between and within states. PTT used a modular approach to estimate final ESA values by vehicle type by summing the ESA values for each axle group in the vehicle or vehicle and trailer combination. This is the same approach used for the 2014 determination.

4.6.3 Analysis of outcomes

The approach taken to assess and analyse WIM data is the most comprehensive undertaken to date. The outcomes are shown in Table 7, which highlights the changes in ESA values that have occurred compared with those estimated in 2013.

The revised national weighed ESA values in the table show there have been some significant changes for a number of vehicle classes. The values in red show where reductions have occurred including, in particular:

- light commercial vehicles
- light rigid trucks
- 2-axle rigid trucks ≤ 12 tonnes
- 3-axle rigid trucks ≤ 18 tonnes and 4-axle rigid trucks ≤ 25 tonnes
- 2- and 4-axle rigid trucks with trailers ≤ 42.5 tonnes
- the smallest of the single-trailer articulated truck fleet
- road trains with three trailers
- special (non-freight) heavy vehicles.

The ESA values for all other vehicle classes in Table 7 have increased and are in a green font.

For the first time, passenger vehicles and light buses have had an ESA value recorded. In the past the impact of passenger vehicles was considered too insignificant to measure. However, the methodology used in this research established that there is still some impact, albeit small.

Some rigid truck classes recorded large increases in their ESAs, in particular the heavier 2-axle trucks with no trailer and the 3- and 4-axle rigid trucks with trailers up to 42.5 tonnes. Most articulated trucks and most buses experienced increased ESAs.

Table 7. Revised national weighted ESA values

PAYGO vehicle class	Current ESA value	New ESA value	ESA difference
Passenger cars	0	0.0010	0.0010
Passenger vans and light buses	0	0.0029	0.0029
4WDs: passenger	0	0.0046	0.0046
4WDs: light commercial	0.0441	0.0062	-0.0379
Light commercials and other light vehicles	0.0419	0.0039	-0.0380
Light rigid trucks	0.0471	0.0136	-0.0335
Rigid trucks: 2 axles, no trailer: 4.5 < GVM ≤ 7.0 t	0.1160	0.0277	--0.0883
Rigid trucks: 2 axles, no trailer: 7.0 < GVM ≤ 12.0 t	0.6104	0.2033	-0.4071
Rigid trucks: 2 axles, no trailer: GVM > 12.0 t	1.5624	2.3474	0.7850
Rigid trucks: 2 axles, with trailer: GCM ≤ 42.5 t	1.1421	0.4286	-0.7135

PAYGO vehicle class	Current ESA value	New ESA value	ESA difference
Rigid trucks: 3 axles, no trailer: 4.5 < GVM ≤ 18.0 t	0.9663	0.1845	-0.7818
Rigid trucks: 3 axles, no trailer: GVM > 18.0 t	2.0639	2.0907	0.0268
Rigid trucks: 3 axles, with trailer: GCM ≤ 42.5 t	1.6659	2.7245	1.0586
Rigid trucks: 4 axles, no trailer: 4.5 < GVM ≤ 25.0 t	1.1762	0.1566	-1.0196
Rigid trucks: 4 axles, no trailer: GVM > 25.0 t	2.4694	2.6250	0.1556
Rigid trucks: 4 axles with trailer: GCM ≤ 42.5 t	1.8781	3.0546	1.1765
Rigid trucks: 3, 4+ axles with trailer: GCM > 42.5 t	4.5124	4.6552	0.1428
Articulated trucks: single trailer: 3-axle rig	1.2617	0.9473	-0.3144
Articulated trucks: single trailer: 4-axle rig	1.4485	1.9694	0.5209
Articulated trucks: single 3-axle trailer: 5-axle rig	1.5137	1.7426	0.2289
Articulated trucks: single 2-axle trailer: 5-axle rig	1.9876	2.7853	0.7977
Articulated trucks: single trailer: 6-axle rig	2.1036	2.7071	0.6035
Articulated trucks: B-double: < 9-axle rig	2.8095	3.9369	1.1274
Articulated trucks: B-double: ≥ 9-axle rig	2.9454	4.2018	1.2564
Articulated trucks: B-triple	3.5240	4.4652	0.9412
Articulated trucks: road train: 2 trailers	3.2747	3.3056	0.0309
Articulated trucks: road train: 3 trailers	4.1204	4.0652	-0.0552
Articulated trucks: single trailer: > 6-axle rig	2.2993	2.7851	0.4858
Other trucks (non-freight)	1.5458	1.5120	-0.0338
Buses: 2 axles: 3.5 < GVM ≤ 4.5 t	0.0200	0.0410	0.0210
Buses: 2 axles: 4.5 < GVM ≤ 10.0 t	0.0500	0.1150	0.0650
Buses: 2 axles: GVM > 10.0 t	1.0800	2.3777	1.2977
Buses: ≥ 3 axles	0.9100	3.8536	2.9436
Buses: articulated	1.3250	2.5275	1.2025

4.6.4 Results

The impact of the revised ESAs on ESA-km cost allocation in the PAYGO model by NTC vehicle class is shown in Table 8. An important aspect of the results shown in this table is that the overall amount of cost allocated nationally on an ESA-km basis remains unchanged

when a revision to ESA values by vehicle class occurs. What changes is the distribution of that ESA-km allocated costs between one vehicle class or group and another. As shown in the table, the total amount of ESA-km allocated cost remains unchanged at \$2,067 million under both the current ESAs and revised ESAs for the 2022–23 charges year. However, there are changes in ESA-km allocated cost by vehicle subgroup. Note, the revised values in Table 8 are similar but not the same as occurs in the PAYGO model options referred to later in this report that incorporate other model changes as well.

The new ESA values have resulted in the heavy vehicle sector increasing its share of ESA-km attributable cost from 94 per cent currently to 99 per cent. Light vehicles in aggregate reduced their share of ESA-km allocated cost by \$97 million (due to reduced ESA values for light commercial and light rigid trucks).

In contrast the heavy vehicle share of ESA-km allocated cost rose by \$97 million. Within the heavy vehicle subgroups in Table 8, ESA-km allocated cost rose by \$100 million for articulated trucks and by \$69 million for buses. However, ESA-km allocated cost for rigid trucks overall fell by \$71 million and for non-freight trucks by \$1 million.

Table 8. Impact of new ESAs on allocated cost

Vehicle group	Current modular ESAs ESA allocation \$m	Revised modular ESAs ESA allocation \$m	Change in ESA attributable costs \$m
Light vehicles	125	29	-97
Rigid trucks	677	606	-71
Articulated trucks	1,186	1,286	100
Other trucks (non-freight)	12	10	-1
Buses	67	136	69
Total all vehicles	2,067	2,067	0
Total for heavy vehicles	1,941	2,038	97
Heavy vehicle share of total costs allocated on the basis of ESA-km	93.9%	98.6%	

The PTT review of ESA values also involved updates to AGM values by vehicle class, with AGM also being a cost allocator in the PAYGO model. This had the opposite effect in the allocation of cost to the heavy vehicle sector with its share of the cost base decreasing by \$262 million, which more than offset the increase in allocated cost from the increase in ESA values. The main reason for the shift of AGM allocated cost from the heavy vehicle sector to the light vehicle sector was that the PTT research provided AGM values for passenger vehicles and vans, which previously had a zero value in the PAYGO model.

4.6.5 Summary of submissions

There was mixed support for the update of ESA values. The ATA was prepared to support the update subject to revising the light vehicle ESAs and consideration of Road Friendly Suspension impacts. NatRoad rejected the ESA update research as not reflecting real-world experience and preferred that further work be done based on a Queensland model that uses a standard axle repetition approach. The BIC didn't object to the updated research but objected to the use of ESA as a cost allocator because it causes a large increase in the costs attributed to buses. The Australian Rail Track Corporation (ARTC) supported using the updated ESA values.

PTT, the NTC's consultant on this ESA project, found no publicly available research to support the ESA values that the ATA recommended in its submission, which would have increased the ESA values for passenger cars and vans to a level inconsistent with other light vehicle categories such as light commercial vehicles, light trucks and buses and the smallest heavy vehicle truck class (2-axle rigid trucks from 4.5 to 7.0 tonnes). However, PTT did recognise that the subject of light vehicle ESAs is an area requiring further research.

On the issue of adjusting the updated ESA values based on WIM data for the impact of Road Friendly Suspensions, PTT found no way of identifying these vehicles from the WIM data to make such an adjustment. PTT also found that the model recommended by NatRoad was not practical to apply to the PAYGO model in its current form and would require a significant amount of data on road type and condition to be collected. The practical choice for this determination is whether to retain the old ESA values or to adopt the new ones developed by PTT. The NTC is confident that the new ESA values represent an improvement over the current ESA values and should therefore be used in the PAYGO model. If better options become available for implementation, particularly for light vehicle ESAs, it is recommended that the NTC would investigate these and report our findings to ITMM.

4.6.6 Conclusion and recommendations

The NTC recommends that:

- the revised ESA values developed by PTT be adopted for use in the PAYGO model
- the NTC investigates adopting alternative values in the future, should better options become available, and report the findings to ITMM.

4.7 Cost allocation

4.7.1 Background

PAYGO uses a combination of a cost allocation matrix and usage data to allocate costs to each vehicle class. This process determines the percentage of total costs allocated to heavy vehicles and light vehicles respectively.

The size of the heavy vehicle cost base, and the level of heavy vehicle charges, are sensitive to the cost allocation specified in the cost allocation matrix. Government revenue from heavy vehicle charges are also directly affected by the cost allocation process.

The current cost allocation matrix has not been changed since 2005. We understand that the current cost allocators were developed by an expert panel based on econometric evidence available at the time. We also understand that the expert panel sought to achieve an acceptable compromise, rather than drawing purely on quantitative research.

More recently, there have been some developments that suggest that updating the cost allocation parameters may be desirable.

In 2017 the NTC commissioned HoustonKemp to review the current cost allocators and to investigate whether there is strong evidence to depart from them. The review concluded that:

... the current PAYGO framework is consistent with the economic principles of avoidable and standalone cost.¹² Based on current cost allocators, the approximately \$3 billion of revenue collected from heavy vehicles in 2015–16 through the application of the PAYGO methodology lies between our estimates of the avoidable and standalone cost of providing heavy vehicle road services of \$2.3 billion and \$7.4 billion in 2015–16, respectively (HoustonKemp, 2017, p. 2).

It further concluded: 'We found that new research on the relationship between heavy vehicle road use and road costs since the last NTC review was insufficient, in and of itself, to support a departure from the current PAYGO allocators' (HoustonKemp, 2017, p. 3).

The HoustonKemp report is not definitive about the preferred allocator(s) for category B2 (refer to Table 9) but does suggest that 70 per cent attributable costs is reasonable and passenger car unit (PCU) per kilometre has no theoretical basis. From this perspective, it is reasonable to interpret this statement as supporting the allocation of 70 per cent of attributable costs based on ESA-km as an improvement over the current cost allocation approach.

More recently, the Victorian Department of Treasury and Finance (VIC DTF) and the Victorian Department of Transport (VIC DOT) commissioned consultants to develop a suite of alternative cost allocators that could be used in an alternative design of an FLCB (ARRB, 2017a; 2017b; 2019).

The consultants developed a range of recommended cost allocators on an engineering basis, using Victorian data and a new roads classification system. These cost allocators are not in a format that could be directly used in PAYGO, although it would be possible to develop an approximation of those cost allocators that could be used in PAYGO.

4.7.2 Key question for the determination

The key question for this determination is whether the current cost allocators should be changed. If so, how should they be changed, and on what basis?

4.7.3 Cost allocation options

Developing a new set of cost allocators from a zero basis would require considerable primary research to be carried out. Even if this research were carried out, it is still not certain that it would produce conclusive results.¹³ This type of research is time consuming and costly and could not easily be completed within the timeframe available for this determination.

Notwithstanding this, the NTC has considered the merits of three approaches, all of which can be modelled and tested relatively easily and do not require significant work to develop.

¹² Economic theory suggests that the price paid by different groups of users of shared infrastructure should fall between avoidable and standalone cost. The avoidable cost is the extra cost of providing the infrastructure to a group of users where the infrastructure is already provided to other groups. The standalone cost is the cost of providing the infrastructure to that group where the infrastructure would be built for the use of that group alone.

¹³ HoustonKemp notes that some research carried out in the past suffered from a range of data and methodological issues and did not provide conclusive results (HoustonKemp, 2017).

These approaches are as follows:

1. Retain the current cost allocation matrix – ‘current’.
2. Modify the current cost allocation matrix to allocate 70 per cent of costs in expenditure category B2 (refer to Table 10) using ESA-km, as proposed in the HoustonKemp report – ‘modified current’.
3. Use the work commissioned by VIC DTF and VIC DOT to develop alternative cost allocators that broadly reflect the cost allocators recommended by ARRB in its report (ARRB, 2019) – ‘VIC DTF/DOT’.¹⁴

We have used our best endeavours to translate the work undertaken by VIC DTF and VIC DOT into a set of cost allocators that can be applied in the PAYGO model.

The cost allocation matrices that represent the three options are shown in Table 9, Table 10 and Table 11.

Table 9. Current cost allocators

		VKT	PCU-km	ESA-km	AGM-km	HV-VKT	Non-attributable	Total
A	Servicing and operating expenses	100%	0%	0%	0%	0%	0%	100%
B1	Routine maintenance	0%	38%	0%	38%	0%	24%	100%
B2	Periodic surface maintenance of sealed roads	0%	10%	0%	60%	0%	30%	100%
C	Bridge maintenance and rehabilitation	0%	0%	0%	33%	0%	67%	100%
D	Road rehabilitation	0%	0%	45%	0%	0%	55%	100%
E	Low-cost safety and traffic improvements	80%	20%	0%	0%	0%	0%	100%
F1	Pavement improvements	0%	0%	45%	0%	0%	55%	100%
F2	Bridge improvements	0%	15%	0%	0%	0%	85%	100%
F3	Land acquisition, earthworks, other extensions/improvement expenditure	0%	10%	0%	0%	0%	90%	100%
G1	Corporate services	0%	0%	0%	0%	0%	100%	100%

¹⁴ This work was developed by the Victorian Department of Transport and the Department of Treasury and Finance to inform discussions around cost allocation. It is not approved Victorian Government policy.

		VKT	PCU-km	ESA-km	AGM-km	HV-VKT	Non-attributable	Total
G2	Heavy vehicle regulatory costs	0%	0%	0%	0%	100%	0%	100%

Table 10. Modified current cost allocators

		VKT	PCU-km	ESA-km	AGM-km	HV-VKT	Non-attributable	Total
A	Servicing and operating expenses	100%	0%	0%	0%	0%	0%	100%
B1	Routine maintenance	0%	38%	0%	38%	0%	24%	100%
B2	Periodic surface maintenance of sealed roads	0%	0%	70%	0%	0%	30%	100%
C	Bridge maintenance and rehabilitation	0%	0%	0%	33%	0%	67%	100%
D	Road rehabilitation	0%	0%	45%	0%	0%	55%	100%
E	Low-cost safety and traffic improvements	80%	20%	0%	0%	0%	0%	100%
F1	Pavement improvements	0%	0%	45%	0%	0%	55%	100%
F2	Bridge improvements	0%	15%	0%	0%	0%	85%	100%
F3	Land acquisition, earthworks, other extensions/improvement expenditure	0%	10%	0%	0%	0%	90%	100%
G1	Corporate services	0%	0%	0%	0%	0%	100%	100%
G2	Heavy vehicle regulatory costs	0%	0%	0%	0%	100%	0%	100%

Table 11. VIC DTF/DOT cost allocators

		VKT	PCU-km	ESA-km	AGM-km	HV-VKT	Non-attributable	Total
A	Servicing and operating expenses	100%	0%	0%	0%	0%	0%	100%
B1	Routine maintenance	0%	10%	0%	0%	0%	90%	100%

		VKT	PCU-km	ESA-km	AGM-km	HV-VKT	Non-attributable	Total
B2	Periodic surface maintenance of sealed roads	0%	0%	56%	0%	0%	44%	100%
C	Bridge maintenance and rehabilitation	0%	11%	0%	4%	0%	85%	100%
D	Road rehabilitation	0%	0%	56%	0%	0%	44%	100%
E	Low-cost safety and traffic improvements	95%	5%	0%	0%	0%	0%	100%
F1	Pavement improvements	0%	0%	68%	0%	0%	32%	100%
F2	Bridge improvements	0%	8%	0%	8%	0%	85%	100%
F3	Land acquisition, earthworks, other extensions/improvement expenditure	0%	5%	0%	0%	0%	95%	100%
G1	Corporate services	0%	0%	0%	0%	0%	100%	100%
G2	Heavy vehicle regulatory costs	0%	0%	0%	0%	100%	0%	100%

4.7.4 Impact of options

Compared with the current approach, adopting either the modified current and VIC DTF/DOT options would have the effect of increasing total costs allocated to the heavy vehicle fleet (Table 12). The modified current option adds approximately 3 per cent to the heavy vehicle cost base, whereas the VIC DTF/DOT option adds close to 10 per cent to the heavy vehicle cost base in recent years.

The information presented in Table 12 and Figure 5 was prepared for the C-RIS and shows the impact of changing the cost allocation approach only. It does not reflect any of the other recommended technical changes discussed in chapter 4.

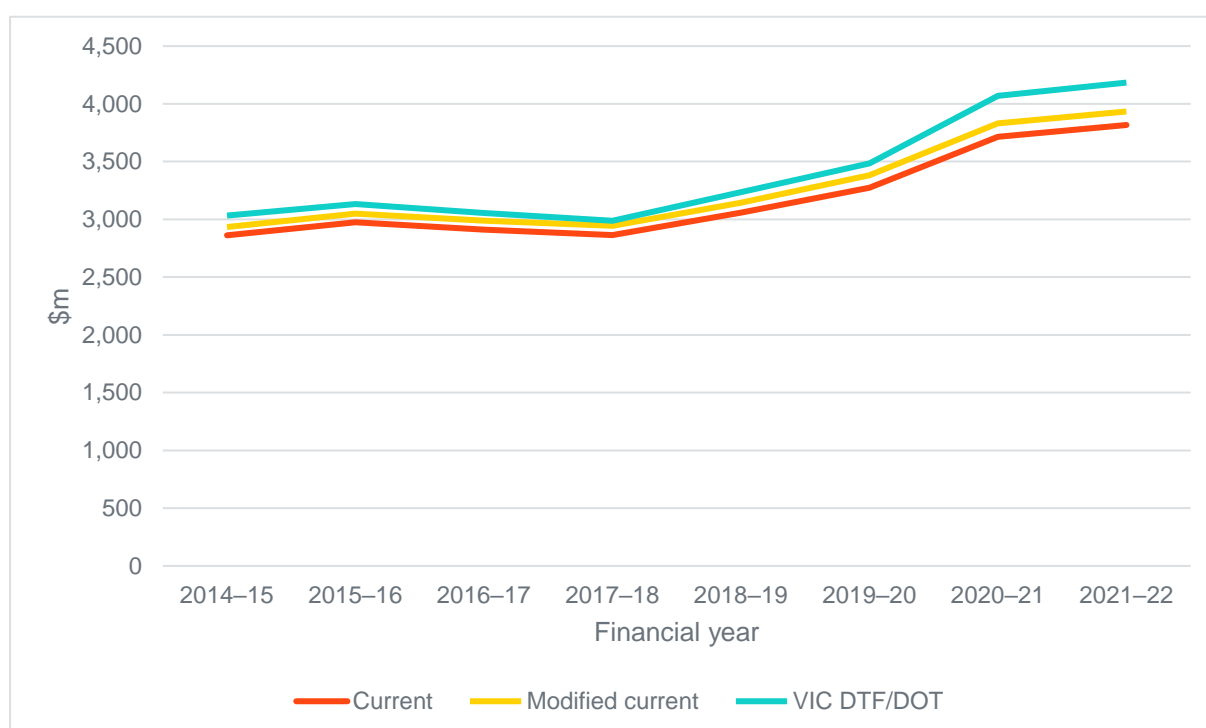
Table 12. Effect on heavy vehicle cost base over time under different cost allocators

Option	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22
Current (\$m)	2,862	2,975	2,912	2,863	3,059	3,275	3,714	3,817
Modified current (\$m)	2,934	3,050	2,989	2,943	3,144	3,381	3,832	3,934

Option	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22
% increase vs current	2.5%	2.5%	2.6%	2.8%	2.8%	3.2%	3.2%	3.1%
VIC DTF/DOT	3,033	3,132	3,056	2,988	3,234	3,485	4,070	4,184
% increase vs current	6.0%	5.3%	4.9%	4.4%	5.7%	6.4%	9.6%	9.6%

This effect is shown graphically in Figure 5.

Figure 5. Estimated heavy vehicle cost bases under different cost allocators



The gap between the revenue provided by current heavy vehicle charges and the heavy vehicle cost base under each option further illustrates the likely effect of changing the cost allocation approach.

4.7.5 Economic efficiency of cost allocation options

Economic theory does not provide a precise answer on how costs should be allocated between users of a common network asset such as roads. Instead, it provides the following broad principles to guide the cost allocation process:

- Road charges to all road users should recover the total cost of providing and operating the road network.

- Heavy vehicle road users should pay at least the costs caused by having access to the road network, including costs related to wear and tear as well as the new road infrastructure costs that would otherwise be avoided.
- The total revenue recovered from a particular type of road user should lie between the standalone cost of providing road infrastructure to that road user and the avoidable cost of providing road infrastructure to that type of road user.

Applying these principles is often made difficult by a relative lack of data.

In its 2017 report, HoustonKemp estimated that the avoidable cost for heavy vehicles was \$2.3 billion in 2015–16 and the standalone cost was \$7.4 billion (HoustonKemp, 2017). Adjusted for consumer price index (CPI) increases between September 2015 and September 2020, these figures would now be approximately \$2.5 billion and \$8.0 billion respectively.

Under all three options, the resulting heavy vehicle cost base falls between these boundaries and would therefore be expected to be economically efficient.

4.7.6 Summary of submissions

Only a limited number of submissions commented on whether additional cost allocation options should be considered as part of this determination.

The BIC expressed concern around the implications of adopting new ESA values in combination with the choice of cost allocation option on buses and suggested that the whole cost allocation process should be reviewed as a matter of urgency, and particularly in relation to ESA-km. The BIC further noted that concerns about adverse impacts on a particular vehicle category (or categories) could be handled partly through the choice of the overall cost recovery rate that is pursued and choice of implementation pathway, but ideally implementation pathways would not be used to cover over weaknesses or uncertainties in cost allocation methodologies, as they affect particular vehicle classes.

The ARTC commented that the current cost allocation in PAYGO treats heavy vehicles as incremental users of the network, whereas it would prefer to see heavy vehicles and light vehicles treated as equal users of the network in the cost allocation process.

We outline submissions on the advantages and disadvantages of the specific three cost allocation approaches considered as part of this determination in chapter 5.

4.7.7 Response to submissions

While noting the BIC's concerns about the implication of the cost allocation for buses, we consider that the cost allocation matrix needs to be chosen with the primary aim of achieving the best overall outcome in allocating costs to heavy vehicles as a whole, and to individual heavy vehicle types.

The current cost allocation approach does not treat heavy vehicles as an incremental user of the network. This is evidenced by the fact that the model uses the total cost of building and maintaining roads as a starting point and then allocates these total costs between different vehicle types. This is a challenge not faced by other similar networks such as electricity transmission or broadband data networks.

While the outcome of the cost allocation process produces a result that could be argued to be between incremental and standalone cost, and possibly closer to incremental cost than it

is to standalone cost, this is simply an outcome of the cost allocation process, rather than an intended design feature.

While there clearly is no consensus on a superior cost allocation approach, submissions did not identify any readily available alternatives to the three approaches considered as part of this determination. Therefore, the NTC has structured the determination around the three options identified above. The advantages and disadvantages of the identified options are presented in detail in chapter 5.

4.7.8 Conclusion and recommendations

Submissions have not identified any other viable options for cost allocation. At the same time, none of the three options being considered is clearly and objectively superior to the others from a pure economic or scientific perspective.

However, the motivation for considering change may include that some options may be more accurate than others. On the other hand, the value of added precision is likely to be limited by the highly averaged nature of heavy vehicle charges.

This means that the choice between cost allocation approaches is one of judgement based on wider considerations, rather than pure economic or scientific analysis.

We therefore have built the options for this determination around the three possible cost allocation approaches being the current approach, modified current and VIC DTF/DOT.

4.8 MaxMan

4.8.1 Background

MaxMan is a separate module of the PAYGO model applying cost allocation to road trains. It has been part of the heavy vehicle charge-setting process since the second heavy vehicle charges determination in 1998. Its name comes from the Matrix Manipulation software that was originally used for the calculations, although these calculations were more recently brought into Microsoft Excel to sit as a module of the PAYGO model.

The original rationale for introducing MaxMan was that road trains do not use the entire road network because they are not allowed to operate in certain states or territories or are only allowed on certain parts of the network in other jurisdictions. There was a view that cost allocation for road trains should be performed separately because of this.

The current MaxMan module assumes that road trains can operate:

- in rural areas of New South Wales and Queensland
- in both urban and rural areas of South Australia, Western Australia and the Northern Territory.

One of the main reasons for introducing MaxMan was to try to reduce the costs allocated to road trains in the model because the quality of roads that they operate on tends to be lower.

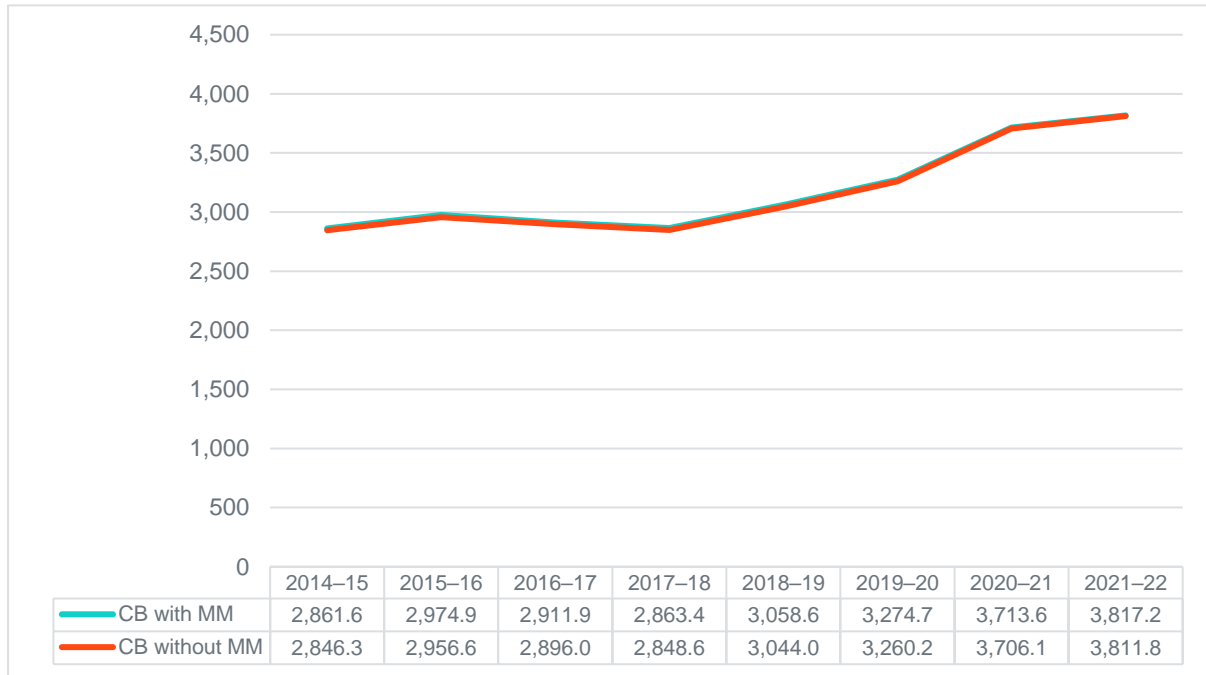
4.8.2 Analysis

MaxMan does not change the amount of attributable expenditure but affects how it is allocated between heavy vehicles and light vehicles. As shown in Figure 6, MaxMan has allocated slightly higher costs to heavy vehicles than would have been the case if it was not

used.¹⁵ However, the overall difference that MaxMan makes is relatively small as a proportion of the total heavy vehicle cost base. The difference between the numbers in the years shown is at most 0.6 per cent.

As expected given the above finding, MaxMan has also increased rather than reduced the costs allocated to road trains (as shown in Figure 7). This is contrary to the original rationale for using MaxMan, which was to lower the allocated costs for road trains to reflect the generally poorer quality of roads used by them.

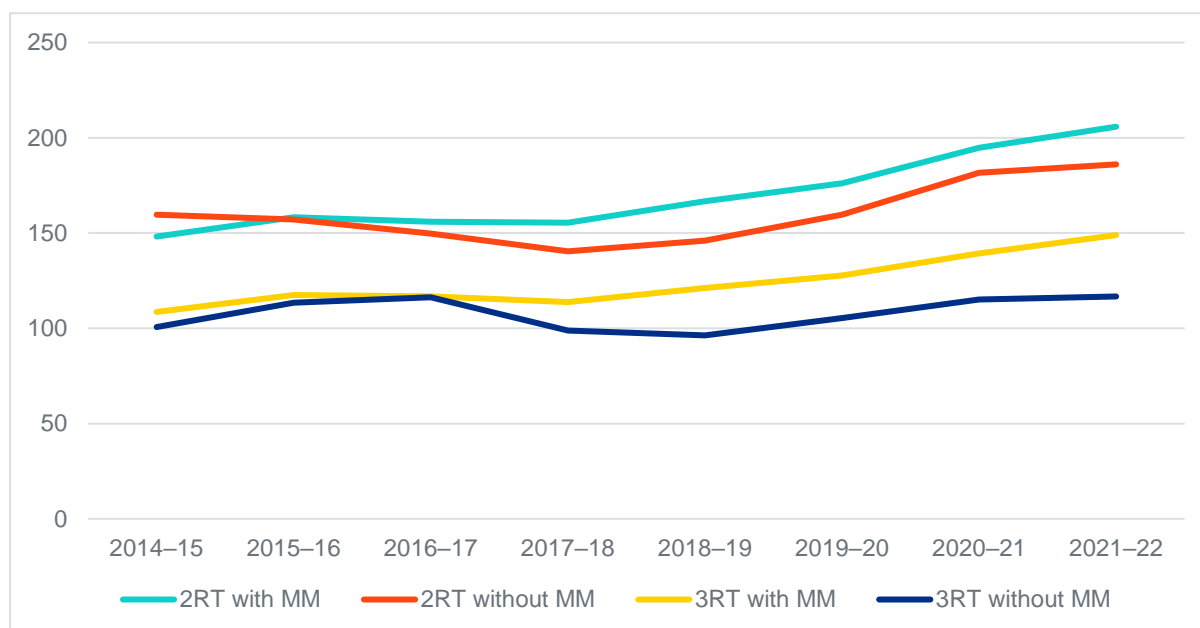
Figure 6. Heavy vehicle cost base with and without MaxMan (\$m)



Note: CB is cost base; MM is MaxMan

¹⁵ The numbers in Figure 6 and Figure 7 reflect the PAYGO model settings as they applied prior to any of the technical changes proposed as part of this determination, which is appropriate as a point of comparison since they were the agreed settings for the PAYGO model during that time.

Figure 7. Allocated costs, with and without MaxMan, for double and triple road trains (\$m)



Note: MM is MaxMan; 2RT is double road train; 3RT is triple road train

The NTC has considered the advantages and disadvantages of retaining MaxMan in the model for future use. Reasons in favour of retaining MaxMan include:

- The module already exists in the PAYGO model and has been part of PAYGO for some time, so there is a need for sufficient evidence to depart from the status quo.
- Road trains arguably have a more distinct use of roads relative to most other heavy vehicles.

The NTC has also identified several reasons, both pragmatic and data/process-related, in favour of removing MaxMan from the calculation of the heavy vehicle cost base under PAYGO, as summarised in Table 13.

Table 13. Reasons to potentially remove MaxMan from PAYGO

Pragmatic	Data/process
<ul style="list-style-type: none"> ▪ Would reduce (arguably unnecessary) complexity in the PAYGO model. ▪ Removing MaxMan would potentially simplify any future annual adjustment process. ▪ MaxMan does not directly affect registration charges for road trains, since the cost allocation process only determines the floor for total charges paid by a vehicle class to avoid cross-subsidisation. MaxMan will only have an effect on registration charges if the floor for total charges is binding. ▪ As of the last determination, registration charges for the articulated segment of the heavy vehicle fleet have been set to reflect the modularity of the fleet. MaxMan reflects a past era for charges where different charges were set for vehicle components to charge road trains 	<ul style="list-style-type: none"> ▪ The usage data from the SMVU underpinning the MaxMan calculations is unreliable, given that it relies on the data at sub-jurisdictional, vehicle class level in many cases. A large percentage of the data from the SMVU at this level has an RSE between 25 per cent and 50 per cent ('should be used with caution') or over 50 per cent ('too unreliable for general use'). This arguably casts doubt on any findings from MaxMan. ▪ The 'sub-set' of the network assumed to be used by road trains and included in the MaxMan

Pragmatic	Data/process
<p>and the corresponding B-double and B-triple combinations' different amounts. Under the current modular charging approach, MaxMan will not have any effect on charges.</p> <ul style="list-style-type: none"> ▪ Adjustments are immaterial compared with the overall heavy vehicle cost base. ▪ The original rationale for MaxMan was to give a discount to road trains to reflect the lower quality of roads that they may use. It is not achieving this objective, given it results in higher costs being attributable. In any case, it is unclear whether the original rationale is still relevant and, if so, whether a complex modelling treatment is the best way of achieving this objective. ▪ Road trains are the only vehicle classes treated separately in this way. No adjustment is made for any other vehicle classes, even though there may be restrictions preventing use or operators' choices not to use certain vehicle combinations in certain areas. 	<p>calculations is arguably not entirely accurate, since road trains are allowed to travel in north-west Victoria and A-doubles are allowed to access the Port of Brisbane.</p> <ul style="list-style-type: none"> ▪ The treatment of SMVU data is inconsistent for road trains in the MaxMan calculations relative to other heavy vehicle classes. It only uses a single (latest available) year of SMVU data, whereas other vehicles use a seven-year EMA. (In principle this could be addressed by using an EMA for MaxMan, but this would add even more complexity to the model.)

4.8.3 Summary of submissions

There were six submissions on MaxMan, from the Australian Livestock and Rural Transporters Association (ALRTA), ARTC, the ATA, the BIC, NatRoad and the NHVR. All submissions supported removing MaxMan, noting its complexity and failure to achieve its stated policy objective.

4.8.4 Conclusion and recommendations

Based on the reasons outlined in Table 13 and the support for these reasons in submissions to the C-RIS, the NTC recommends that:

- MaxMan should be removed from the PAYGO model.

The modelling presented in the following chapters of this D-RIS does not use MaxMan.

4.9 Road user charge leakages

4.9.1 Issues

The heavy vehicle charges calculated by the NTC under the PAYGO system are designed to achieve cost recovery. That is, the charges in the PAYGO model are set to recover the heavy vehicle cost base, given the registered heavy vehicle and heavy trailer fleet, and the estimated quantity of fuel used by heavy vehicles.¹⁶ Changes to any of the cost base, vehicle

¹⁶ In practice there is some inherent inaccuracy in the cost recovery process, given the lag between the availability of usage data and the period for which charges are being set in the PAYGO system as outlined in section 2.2.8. In addition, the degree of accuracy of the fuel estimate in the SMVU is unclear, but it remains the best available method of calculating the amount of RUC revenue in Australia.

population or fuel use requires changes in the level of heavy vehicle charges to preserve cost recovery.

The best data source for estimating fuel usage is the SMVU. However, a potentially substantial amount of fuel has become exempt from paying the RUC on the basis that the fuel was used to power auxiliary equipment and for off-road use, rather than ‘for travelling’ on a public road as specified in the *Fuel Tax Act 2006*. Examples of auxiliary equipment use on which the RUC is not payable include:

- concrete transport vehicles with rotating mixer drums
- refrigerated vehicles
- waste management collection vehicles
- vehicles with specialised equipment, such as elevated work platforms, loader cranes or drilling equipment
- long-haul vehicles with sleeper cabins.

These ‘exemptions’ or ‘leakages’ from paying RUC reduce the amount of revenue collected through the RUC, all else remaining constant. That is, the amount of fuel that is actually subject to the RUC is likely to be less than what is estimated from using the SMVU, which simply records total fuel used.

This workstream investigates this issue in more detail. One challenge in attempting to adjust for these ‘leakages’ is a lack of reliable data, meaning that there must be some assumptions or estimates used – this is discussed in more detail in section 4.9.2. In summary:

- The RUC aims to recover a proportion of the heavy vehicle cost base through a charge on each litre of fuel that is used by heavy vehicles for travelling on a public road.
- Over the past few years, certain uses of fuel by heavy vehicles have been exempted from paying the RUC on the basis that the fuel is not being used for travelling on a public road. As a result of these exemptions, the amount of RUC being recovered is less than intended when setting charges under the PAYGO model.

4.9.2 Analysis

The categories of auxiliary fuel use exempted from paying the RUC have increased since the original decision by the Administrative Appeals Tribunal of Australia to allow an exemption for refrigerated trailers in August 2012 (Administrative Appeals Tribunal of Australia, 2012). The Australian Taxation Office (ATO) released practical compliance guidelines in September 2016 (subsequently updated in October 2019) to outline the types of heavy vehicles or trailers with auxiliary equipment that may claim an exemption from paying RUC, as well as ‘fair and reasonable’ percentages of total fuel use not subject to the RUC for the various types of auxiliary equipment (ATO, 2019). In addition, claims for off-road-use fuel tax credit exemptions, independent of auxiliary equipment use, have become more widespread.

The NTC’s estimate of the total amount of RUC revenue collected is calculated by multiplying fuel usage data from the SMVU by the RUC rate (in cents per litre). The SMVU form asks the following question relating to fuel: ‘What was the total amount of fuel consumed by this vehicle during the four-month period 1 July 2019 to 31 October 2019?’

(ABS, 2019).¹⁷ Although there could be alternative interpretations, the NTC considers that this question would typically be answered by survey respondents as the total amount of fuel used, including fuel used for any auxiliary equipment. If this is the case, the estimated fuel consumption data specified in the SMVU may overstate the actual fuel that is subject to the RUC and, as a result, may overstate the actual amount of RUC revenue that is currently being collected.

The total annual value of fuel tax exemptions for off-road and auxiliary equipment use cannot be accurately estimated by the ATO both in terms of the exemption rates used by individual claimants or the extent to which heavy vehicle operators make claims at all for off-road and auxiliary equipment use.

The ATO estimates some 112,000 businesses claiming fuel tax credits are operating heavy vehicles on road. This is an indicative estimate only. In an independent research report prepared for the ATA and NatRoad, Deloitte Access Economics recently estimated there were 146,862 businesses operating trucks in Australia, comprising 55,936 hire and reward operators and 90,926 ancillary operators. Based on these figures, at least 34,800 businesses operating trucks (24 per cent of all trucking businesses) are not claiming fuel tax credits at all. In reality, the figure would likely be higher than 24 per cent because the ATO estimate would include businesses operating buses.

These businesses could be expected to be outside the hire and reward industry and could be expected to be small. Many of the trucks would be pre-1996, since we also know from the ATO data that many operators of pre-1996 vehicles choose not to claim fuel tax credits because of the need to meet the pre-1996 environmental criteria to claim fuel tax credits.

On the other hand, the large hire and reward trucking companies claim fuel tax exemption rates for off-road and auxiliary equipment use that are well above the ATO's 'fair and reasonable' rates if they have invested in obtaining engine diagnostic proof to justify higher fuel consumption rates.

NTC modelling assuming all heavy vehicles claim for off-road and auxiliary equipment use at the ATO's 'fair and reasonable' rates indicates that the reduction of fuel tax (RUC) revenue would be around \$80 million per annum compared with the PAYGO estimate of annual RUC revenue of \$1.963 billion. If this is adjusted down for the 24 per cent of trucking businesses that are estimated to not claim for off-road and auxiliary equipment use then the aggregate reduction falls.

Most of these businesses are small and in the non-hire and reward industry, where average travel rates are lower than in the hire and reward industry (based on anecdotal evidence), but estimates of what share of overall fuel use these businesses account for is at best speculative.

One option to address this issue would be to adjust the fuel consumption figure that is used in the PAYGO model to set the RUC rate. This option is summarised in Table 14.

¹⁷

[https://www.abs.gov.au/websitedbs/d3310114.nsf/4a256353001af3ed4b2562bb00121564/5dff3ab82130e7e0ca257c070010f3b8/\\$FILE/SMVU_Survey_Guide_2019-20.pdf](https://www.abs.gov.au/websitedbs/d3310114.nsf/4a256353001af3ed4b2562bb00121564/5dff3ab82130e7e0ca257c070010f3b8/$FILE/SMVU_Survey_Guide_2019-20.pdf). The time period in the text is adjusted as relevant for the survey period.

Table 14. Potential approaches for determining the RUC rate

Current approach	Alternative approach
$RUC\ rate = \frac{TR_{RUC}}{FU_{SMVU}}$	$RUC\ rate = \frac{TR_{RUC}}{FU_{on-road\ travelling}}$

Where:

RUC rate is the RUC rate, in dollars per litre

TR_{RUC} is the target revenue to be raised from RUC, in dollars

FU_{SMVU} is the fuel usage data from the SMVU, in litres

FU_{on-road travelling} is fuel usage data reflecting only fuel that is used for on-road travelling (i.e. excluding fuel used for auxiliary equipment), in litres.

Setting the RUC rate on the basis of the alternative approach would ensure the intended amount of revenue (*TR_{RUC}*) is collected, since the denominator used to set the RUC rate is also the total amount of fuel that is actually subject to the RUC. The primary challenge in implementing this approach is the quality of data. This is for the following, non-exhaustive, list of reasons:

- Although the SMVU is the best, and only, source of data available for estimating the total amount of fuel consumed and distances travelled by various types of heavy vehicles, the data becomes increasingly unreliable at greater levels of disaggregation.
- The types of auxiliary equipment subject to RUC exemptions may evolve over time, meaning any such calculations may need to be updated regularly.
- The ‘fair and reasonable’ percentages that the ATO allows for each type of auxiliary equipment may change over time.
- Use of the ATO’s ‘fair and reasonable’ percentages is not mandatory for operators, and it is not clear what proportion of claimants use their own methodology instead of relying on the ‘fair and reasonable’ percentages.
 - For example, an operator could conduct its own testing and may find that its refrigeration unit uses 20 per cent of the total amount of fuel, rather than the 10 per cent ‘fair and reasonable’ percentage quoted by the ATO. If based on test results or some other approved methodology, this would be permitted by the ATO. However, it would also mean that the denominator on the right-hand side would not reflect the actual amount of fuel subject to the RUC (if the RUC rate was calculated by assuming everyone uses the ‘fair and reasonable’ percentages). As a result, the total RUC revenue collected would be lower than intended.
- The availability of the necessary registration data to conduct these calculations varies across jurisdictions. Registration data is needed at a finer level of detail than the NTC’s typical quarterly registration data collection, in order to calculate how many concrete trucks, rubbish trucks, refrigerated trailers, etc. are operating. Assumptions may therefore be required if the relevant data is not available for any jurisdictions.

As a result, any amended RUC rate that was calculated based only on information available from the SMVU and from jurisdictions’ registration databases would be likely subject to some degree of inaccuracy. Other potential options to try to resolve this issue are:

- seeking detailed data on auxiliary equipment fuel use from operators (potentially based on a sample of some of the largest operators)
- changing the wording of the Fuel Tax Act to make all fuel used on public roads subject to RUC (even if used for auxiliary equipment)

- switching to an alternative variable charging mechanism for heavy vehicles, such as a form of distance-based charging.

4.9.3 Approaches and advantages and disadvantages for RUC leakages

The approaches and associated advantages and disadvantages we have identified in our preliminary analysis are outlined in Table 15.

Table 15. Assessment of potential approaches for treating RUC leakages

Approach	Advantages	Disadvantages
1. Status quo (retain fuel consumption estimate from SMVU for calculating the RUC rate)	<ul style="list-style-type: none"> ▪ Simple approach that does not require any additional estimates or assumptions. ▪ Operators who do not currently benefit from the RUC exemptions are not impacted negatively by any potential policy change that could occur under the other options. 	<ul style="list-style-type: none"> ▪ RUC revenue collected fails to achieve the cost recovery intended under PAYGO because the amount of fuel subject to the RUC is lower than the amount assumed for modelling purposes.
2. Use best estimate of RUC exemptions/ leakages – derived from jurisdictions' detailed registration data and the SMVU – to recalculate RUC rate based on the fuel that is actually subject to RUC This would likely involve a conservative approach using ATO 'fair and reasonable' standard exemption rates	<ul style="list-style-type: none"> ▪ The amount of RUC revenue recovered would be closer to the intended target than under the status quo. ▪ Using the ATO 'fair and reasonable' exemption rates is a conservative estimate, which would reduce the risk of over-recovering the heavy vehicle cost base. 	<ul style="list-style-type: none"> ▪ Data availability to calculate fuel used by auxiliary equipment is imperfect (as outlined in the previous section). There could be some risk of inaccuracies being introduced because of poor-quality data or the need to use assumptions. ▪ Adopting this option would likely mean a rise in the general RUC rate, particularly affecting the large number of operators who do not use auxiliary equipment and benefit from the exemptions.
3. Seek detailed data on auxiliary equipment fuel use from operators (potentially based on a sample of some of the largest operators)	<ul style="list-style-type: none"> ▪ This option would potentially significantly improve the accuracy of the estimated amount of fuel subject to RUC exemptions (relative to option 2). 	<ul style="list-style-type: none"> ▪ The data would either need to be provided by operators on a voluntary basis, or included in a possible alternative to the SMVU (as explored in section 4.5). ▪ The NTC cannot compel operators to provide information, and there is limited (or no) incentive for operators to provide the relevant data because it would result in an increase to the general RUC rate. ▪ The structure of the trucking industry – with a large number of small operators – means it would be extremely difficult to collect data from all operators. It is not clear how large a sample of operators would need to provide data

Approach	Advantages	Disadvantages
		to be deemed sufficiently representative of the entire industry.
4. Change the wording of the Fuel Tax Act to make all fuel used on public roads subject to RUC (even if used for auxiliary equipment)	<ul style="list-style-type: none"> ▪ Could achieve cost recovery without the need to source data from operators or make assumptions. 	<ul style="list-style-type: none"> ▪ Outside the scope of this determination. ▪ Vehicles using fuel to power auxiliary equipment would arguably cross-subsidise other vehicle operators.

4.9.4 Summary of submissions

Responses on the issue of allowing for fuel tax credit exemptions in the PAYGO model were mixed. The ATA preferred not to address RUC exemptions in this determination but submitted that if this was to occur it should be at the ATO Basic Heavy Vehicle Apportionment Method rate of 1.6 per cent and should exclude refrigerated trailer auxiliary equipment fuel use.

The ATA also argued that there is no conceptual difference between the registration charge on concessions and the RUC exemptions. It submitted that they both represent a positive legislative or quasi-legislative decision to forego revenue in favour of achieving a valued objective, and therefore it is internally consistent to treat them in the same way.

NatRoad submitted that an adjustment should not be introduced and that fuel tax credits were in fact underclaimed in aggregate and were not causing a net leakage of fuel charges (based on the ATO's tax gap analysis).

Both the BIC and ARTC supported including an estimate of RUC exemptions in the PAYGO model.

4.9.5 Conclusion and recommendations

In addressing the ATA's submission, we have now modified our estimate of the cost of RUC exemptions down. This also reflects confirmation from the ABS that its SMVU fuel use data excludes the consumption of fuel used to power auxiliary equipment on refrigerated trailers. However, the ATO rate of 1.6 per cent is only intended as a base rate for small operators who claim less than \$10,000 per annum in fuel tax credits and is only for off-road use. It is not intended for use for auxiliary equipment fuel use. With auxiliary equipment 'fair and reasonable' base rates in the range of 5–30 per cent, depending on the vehicle's type of auxiliary equipment, applying a universal rate of 1.6 per cent is likely to understate the amount of credits actually claimed.

Previous ATO documents on tax gaps have listed a negative tax gap in relation to fuel tax credits due to claimants underclaiming their correct entitlements. For example, the last ATO report on tax gaps listed a tax gap of -\$7 million in 2018–19 (ATO, 2021). However, the ATO has advised that the survey data this was based on was outdated – it used a 2015 survey when it had only just introduced its fair and reasonable rates and most potential claimants didn't know about the new exemption possibilities. Since that time industry claims for auxiliary equipment and off-road fuel use have become much more widespread.

The NTC considers that it would also not be appropriate to treat the RUC exemptions for auxiliary equipment similar to the targeted concessions on registration charges provided by states and territories on registration charges. Similarly, the NTC does not believe that court decisions around exemptions from the duty to pay RUC on fuel used to power auxiliary

equipment were intended to have the effect of reducing the total amount of RUC collected. Instead, the NTC considers that these court decisions were primarily aimed at resolving the question of the types of fuel use that are subject to RUC.

The overall objective of setting RUC rates under PAYGO has always been to collect a given proportion of the overall cost base on the amount of fuel that is subject to RUC. The proposed adjustment is consistent with this overall aim by improving the estimate of the amount of fuel subject to RUC to ensure the correct amount of revenue is collected in total, subject to the limitations of the available data.

The NTC still considers that approach 2 in Table 15, as amended, would be an appropriate and conservative approach to estimate the amount of RUC exemptions claimed. This estimate would be based on jurisdictions' detailed registration data and the SMVU.

The recommended adjustment of 4.0 per cent implies that the RUC rate would need to increase by a similar percentage, or approximately 1.1 cents per litre to recover the required revenue.

The NTC recommends:

- implementing approach 2 in Table 15, as amended, which uses a conservative approach to produce an estimate of RUC exemptions using the ATO's 'fair and reasonable' fuel tax rate exemption rates
- applying a reduction of 4 per cent to the estimates of total fuel consumption in the PAYGO model to reflect estimated RUC exemptions and arrive at an estimate of fuel that is actually subject to RUC.

4.10 Unsealed road travel discounts

4.10.1 Issues

Discounts for unsealed road travel by road trains were introduced into the PAYGO model in 2005 in response to industry feedback that road trains in particular did a considerable share of their annual travel on unsealed roads. The PAYGO model assumes that all the road network is sealed in the application of its cost allocators, which is particularly relevant to the ESA-km cost allocator. The results of industry surveys in 2005 found that on average 30 per cent of double road train travel was on unsealed roads and 35 per cent of triple road train travel was on unsealed roads. In 2012 this discount was also applied to B-triples when the NTC modelled B-triples separately for the first time. The issue is whether the application of this discount is still appropriate and, if so, whether an updated industry survey on unsealed road travel is required.

4.10.2 Background

In 2005 a number of stakeholders argued that applying the ESA-km cost allocator was not relevant for unsealed road travel and that VKT was a fairer allocator because unsealed roads were affected more by climate and the number of wheel passes.

In response, the NTC requested survey-based evidence on the share of road travel on unsealed roads. Several industry associations provided responses – the major responses were from the Australian Road Train Association, the Australian Livestock Transport Association, the ATA branches in the Northern Territory and Queensland, and the Western Australian transport forum.

A weighted average analysis of these survey responses relative to SMVU road train travel estimates resulted in an average unsealed travel share of 30 per cent for double road trains and 35 per cent for triple road trains.

4.10.3 How the discount is applied

The unsealed discount is applied just to the ESA-km allocated cost to obtain an adjusted allocated cost overall. The discounted ESA-km element is then redistributed by VKT across the rest of the heavy vehicle and light vehicle fleets, with the vast majority going to the light vehicle fleet.

4.10.4 Impacts

The unsealed road travel discounts result in a heavy vehicle cost base that is around \$69 million (or 1.6 per cent) lower than would otherwise be the case under the current PAYGO model. Attributable costs for B-triples and road trains are 14–17 per cent lower than would otherwise apply. Measuring the impact on heavy vehicle registration charges for B-triples and road trains is less certain due to the broader impacts of charge setting within the PAYGO model.¹⁸ However, the heavy vehicle industry clearly benefits overall from a lower cost base than otherwise would be the case.

4.10.5 Summary of submissions

There was uniform support for continuing with the unsealed travel discount and an updated survey from the submissions including the ATA, NatRoad, the BIC and ARTC. The major trucking associations tried to undertake a survey of their members in the available time, but the response rate was very poor and results inconclusive due to the disruption to the industry from the current pandemic.

4.10.6 Conclusion and recommendations

The NTC had hoped to have a new unsealed travel survey available to update the unsealed travel shares from 2005. However, this was not feasible in the available time despite industry associations' generous assistance, due to the many pressures on the industry caused by the ongoing pandemic. The NTC therefore recommends continuing to use the current approach until better information on travel on unsealed roads can be obtained. The NTC recommends that it investigates possible data sources after the determination.

The NTC recommends that:

- the current unsealed road travel discounts continue to be used in the PAYGO model
- the NTC investigates options to update the percentages used to calculate the unsealed road discount in PAYGO after the determination.

¹⁸ The PAYGO model has a cross-subsidy check to ensure each vehicle class recovers at least its attributable costs through the charges paid (registration and RUC). However, beyond this cross-subsidy check – and an overall check that the charges paid by all heavy vehicles recover revenue equivalent to the heavy vehicle cost base – the PAYGO model does not automatically calculate/adjust charges for individual vehicle classes based on the results of the cost allocation process.

4.11 Community service obligations discount

4.11.1 Issue

At the same time that the issue of unsealed road travel by road trains was being addressed in 2005, the issue of community service obligations (CSOs) also arose. Industry argued that the cost base for heavy vehicles should be adjusted to take account of CSO-related expenditure. This mainly affected the road train industry servicing remote settlements. Industry suggested that a separate CSO discount should apply to remote areas because road expenditure is often not warranted by traffic levels but is necessary to support these communities.

The CSO discount rate was based on responses from relevant state and territory transport agency officers that provide the annual expenditure returns. Accurate estimates were not possible, but approximate estimates of 2–7 per cent were provided for the share of arterial road expenditure that could be considered CSO-related. The NTC adopted a rate of 5 per cent for both double and triple road trains. The issue is whether this discount – which has not been reviewed since its inception in 2005 – should be retained and, if yes, whether it should be reviewed with updated estimates.

4.11.2 Analysis and impacts

In the PAYGO model the CSO discount is taken off the adjusted attributable allocated cost for road trains after the unsealed travel discount has first been applied. The cost is then reallocated on a VKT basis to the rest of the heavy and light vehicle fleets, with the light vehicle fleet again absorbing the vast majority.

The application of the CSO discount on its own (i.e. independent of the unsealed travel discount) results in a heavy vehicle cost base that is \$12 million lower than would otherwise be the case.

4.11.3 Summary of submissions

Most submissions supported retaining the CSO discount and either expanding it or doing further work on this subject, such as the submissions from the ATA, NatRoad and the BIC. In contrast the ARTC supported the NTC's position in the C-RIS to remove the discount.

The ATA submission noted the high cost to the trucking industry of servicing remote communities with the cost of maintenance and tyres significantly higher than in other areas due to the poor condition of the roads in general. The ATA also referred to the House of Representatives Indigenous Affairs Committee on food pricing and food security in remote Indigenous communities, which has a report currently being considered by the Australian Government that includes recommendations for subsidising core healthy food freight and subsidies to operators to lower the cost of servicing these communities. The ATA recommended that the NTC should participate in this whole-of-government process.

4.11.4 Conclusion and recommendations

While we recognise the importance of CSOs as highlighted in the ATA's submission, we do not consider that this supports retaining the current CSO discount mechanism in the PAYGO model. There are still strong reasons to remove it, including the minimal impact of the CSO discount, the uncertainty around its estimation and the fact that it is poorly targeted.

The NTC recognises the significant impact to food prices and cost to operators of servicing these areas, as outlined in the ATA's submission. However, the CSO discount in the PAYGO model relates to the cost to government of trying to maintain roads to these remote

communities rather than the cost to industry of servicing these communities. The NTC believes there are better policy instruments that can be used in the CSO area, outside of the PAYGO model, that can help to better address these issues.

The main issue with the CSO discount has always been the ability to measure the CSO component of road expenditure because road authorities have difficulty isolating and judging whether road expenditure meets the CSO criteria.

Given the minimal impact it has on the cost base and the degree of uncertainty in its measurement, the NTC recommends that:

- the CSO discount be discontinued.

4.12 Heavy vehicle concessions

Heavy vehicle concessions refer to the discounts offered by state and territory governments to some recipients such as charity organisations.

The general purpose of heavy vehicle concessions is to alleviate the impact of registration charges for particular operators who are facing special circumstances such as primary producers, not-for-profit operators or operators requiring more trailers than usual.

Because the financial impact of concessions is borne by the jurisdictions that offer them, concessions have been treated as a matter for states and territories to decide individually in previous determinations. Concessions are not reflected in estimated revenue figures calculated using the PAYGO model.

During consultation, the general consensus was that this approach should continue for the current determination and, therefore, heavy vehicle concessions are not a feature of this determination.

4.13 Electric heavy vehicles

4.13.1 Issues

Electric vehicles are an issue for any system that is based primarily on road-related fuel charges for excise revenue such as the RUC that applies in Australia to heavy vehicles. At present the electric-powered heavy vehicle fleet in Australia is insignificant but is forecast to grow substantially off a very small base.

The PAYGO model does not currently cater for electric vehicles because the RUC assumes that all heavy vehicles use liquid fuels – almost 99 per cent of all heavy vehicle fuel use is diesel (most of the rest is compressed natural gas used in buses). The SMVU includes VKT from the couple of electric heavy vehicles it picked up in its last survey but does not record any fuel use. Do we need to adjust the PAYGO model to enable the impact of electric heavy vehicles to be measured in future and how should we do this?

4.13.2 The current electric heavy vehicle fleet

The NTC has attempted to measure the current electric heavy vehicle fleet in Australia with mixed success. Part of the issue is the extent to which electric vehicles are being separately identified and reported by registration authorities.

For jurisdictions that do report data on electric heavy vehicles, there are two types: those that are solely electric-powered, and those that are hybrids with mixed diesel fuel and electric power capabilities (as shown in Table 16).

Table 16. Electric heavy vehicles reported to date

Jurisdiction	Electric only	Hybrid	Total electric and hybrid	Total heavy vehicle fleet – all types
NSW	11 rigid trucks 11 buses	80 trucks 2 prime movers	104 all types	142,878
WA	3 rigid trucks 1 prime mover 1 special vehicle	1 rigid truck 2 prime movers 11 special vehicles	19 all types	85,752
Vic	3 buses	22 trucks	25 all types	137,506
NT	2 special vehicles	1 rigid truck	3 all types	7,023
ACT	2 buses		2 all types	2,586
Qld			None listed	114,963
SA			Not recorded yet but will be in future	39,734
Tas			No response (may not be identified)	14,298
Total			153	543,740

Based on the table above there are currently only 153 heavy vehicles that are solely electric or hybrid-powered. This represents just 0.03 per cent of the national heavy vehicle fleet. The travel of such a small component of the heavy vehicle fleet would be insignificant and would have no impact on the heavy vehicle cost base.

Electric heavy vehicles will become more important as time goes by, and the NTC is aware of international truck and prime mover manufacturers investing in electric heavy vehicles.

4.13.3 Summary of submissions

The submissions agreed with the NTC's position on electric heavy vehicles for this determination (e.g. the ATA, NatRoad, the BIC and the NHVR). However, they all noted the future potential of electric vehicles and the need for a road pricing system to accommodate these vehicles.

4.13.4 Conclusion and recommendations

Given the electric heavy vehicle fleet is currently insignificant, it is proposed that no adjustments be made to the PAYGO model for the 2021 determination. However, given the increasing importance of electric vehicles, and the potential implications for cost recovery from heavy vehicles, we recommend that the NTC starts collecting data on electric vehicles, assesses the likely implications under the current heavy vehicle charges and provides an update to ITMM in 2024, so that any conclusions can be taken into account at the end of the first three-year fixed price charging period, if agreed by ITMM.

The NTC recommends that:

- state and territory road agencies regularly provide data to the NTC on electric vehicles by type
- the NTC monitors the number of electric vehicles over time and assesses their impact on cost recovery for heavy vehicles under the current heavy vehicle charges over time
- the NTC makes this information available to states, territories and the Commonwealth through ITMM
- the NTC provides an update to ITMM at the end of 2024.

4.14 Recovery of regulatory costs

4.14.1 Background

When the NHVR was established, the intergovernmental agreement stipulated that the ongoing cost of operating the regulator would be recovered from heavy vehicle operators through a new regulatory component of registration charges.

This applies only to heavy vehicles registered in participating states and territories. Registration charges applying in Western Australia and the Northern Territory are set independently from the PAYGO model and reflect regulatory costs of those jurisdictions.

The approach for setting the regulatory component of registration charges was first set as part of the 2014 determination. However, a separate regulatory component of registration charges was first collected in 2016–17.

As part of this determination, we have reviewed the current approach to ensure it meets the following key objectives of ensuring that:

- the regulatory component of registration charges continues to provide the NHVR with enough revenue to fund its approved budget
- the costs of operating the NHVR are allocated between different heavy vehicle types on a reasonable basis.

4.14.2 Current approach

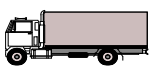






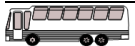




The current approach was developed as part of the 2014 determination. Under this approach, regulatory components of registration charges are set for each individual truck and trailer type as follows:

- 25 per cent of the total budget is allocated on a fixed, per vehicle basis. The intention is to reflect a relationship between the NHVR's costs and the overall size of the heavy vehicle fleet.
- 45 per cent of the total budget is allocated on the basis of AGM for this particular vehicle type, representing the concept that the overall risk imposed by heavy vehicles increases with weight.
- 30 per cent of the total budget is allocated on the basis of VKT for each vehicle type, representing the concept that those vehicle types making greater use of the road network should pay a greater proportion of the NHVR's costs.
- Each trailer is charged a fixed fee (\$55 in 2020–21), recognising the modular nature of the vehicle fleet where trailers can be part of a range of different vehicle types.

The percentages above were not set based on a quantitative analysis of cost drivers. They were primarily chosen to achieve a reasonable progression of total registration charges across different types of heavy vehicles.

Table 17 shows the roads and regulatory components of registration charges applying to common heavy vehicle types in 2020–21.

Table 17. Roads and regulatory components of registration charges in 2020–21

Vehicle type	Mass rating for charging	Roads component (\$)	Regulatory component (\$)	Total registration charge (\$)
	Up to 12.0 t	412	195	607
	Over 12.0 t	720	255	975
	Up to 42.5 t	1,944	341	2,285
	Up to 16.5 t	720	230	950
	Over 16.5 t	817	325	1,142
	Up to 42.5 t	2,653	416	3,069
	Over 42.5 t	10,742	702	11,444
	Over 42.5 t	11,354	704	12,058
	Up to 20.0 t	720	245	965
	Over 20.0 t	817	346	1,163
	Up to 12.0 t	309	204	513
	Over 12.0 t	309	334	643
		2,260	414	2,674
		5,767	458	6,225
		13,739	1,020	14,759
		13,739	1,076	14,815
		15,398	1,186	16,584

Since 2016–17, regulatory components of registration charges have been adjusted by scaling up or down to reflect changes in the NHVR budget and the size and composition of the heavy vehicle fleet.

4.14.3 Issues

The current approach has been successful in providing the NHVR with enough revenue to cover its approved budget. Arguably, the process of scaling regulatory charges up or down to reflect changes in the NHVR's budget or the vehicle fleet have also worked.

The process of asking ministers to approve both the NHVR's budget and, subsequently, the resulting regulatory charges, has proven to be relatively onerous. It could be desirable to develop a process that would automatically adjust regulatory charges to recover the approved NHVR budget.

Also, given updated usage data, it would also be desirable to consider whether the level of regulatory charges for each vehicle type should be reset.

4.14.4 Options

There are three options for setting regulatory charges in future years:

1. Retain the current regulatory charges but scale up or down to reflect changes in the NHVR's budget.
2. Reset the regulatory charges using the existing methodology with updated information on weight (AGM) and distance travelled (VKT) and the registered heavy vehicle fleet.
3. Develop a new, alternative approach to setting regulatory charges.

In addition, there are two possible approaches to adjusting regulatory charges each year to ensure the NHVR's approved budget continues to be recovered:

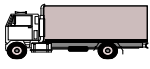











- continue with the current approach of ministers approving the regulatory charges each year
- implement an automatic indexation mechanism that would scale the regulatory charges up or down each year to reflect changes in the NHVR's budget and changes in the heavy vehicle fleet.

4.14.5 Assessment

The key consideration when deciding how to set regulatory charges for future years is whether there is enough trust that the current approach is working appropriately. While there is no empirical research of cost drivers underpinning the allocation percentages, the regulatory charges have successfully recovered the cost of operating the NHVR. From this perspective, the NTC considers there is limited benefit in developing a completely new methodology. This view also reflects that regulatory charges are only a relatively small part of total heavy vehicle charges and the impact of any change is likely to be minimal.

Table 18 shows the current regulatory charges and those that would apply on the basis of the NHVR's approved budget for 2022–23.

Table 18. Recalculated regulatory components of registration charges

Vehicle type	Mass rating for charging	Current regulatory component scaled (\$)	Re-calculated regulatory component (\$)	Change (\$)	Change (%)
	Up to 12.0 t	195	202	7	4
	Over 12.0 t	255	262	7	3
	Up to 42.5 t	341	334	-7	-2
	Up to 16.5 t	230	236	6	3
	Over 16.5 t	325	335	10	3
	Up to 42.5 t	416	403	-13	-3
	Over 42.5 t	702	706	4	1
	Over 42.5 t	704	708	4	1
	Up to 20.0 t	245	268	23	9
	Over 20.0 t	346	381	35	10
	Up to 12.0 t	204	197	-7	-3
	Over 12.0 t	334	358	24	7
		414	409	-5	-1
		458	439	-19	-4
		1,020	978	-42	-4
		1,076	1,034	-42	-4
		1,186	1,144	-42	-4

Given all other aspects of the PAYGO model are being updated to reflect the latest expenditure and usage data, we consider that it would be inconsistent not to update the calculation of regulatory charges at the same time. Therefore, the NTC recommends the second option outlined in section 4.14.4 – to reset the regulatory charges using updated information.

The current approach for periodically resetting regulatory charges involves ministers making regular decisions to reset regulatory charges. This process is cumbersome and administratively inefficient. The NTC recommends that regulatory charges be automatically adjusted each year to reflect the approved NHVR budget by scaling the initial set of regulatory charges up or down. This will avoid unnecessary administrative effort. Ministers will retain complete control over regulatory charges through approving the NHVR's budget. This can be achieved through changes to the model law.

4.14.6 Summary of submissions

Only the BIC specifically commented on this topic. It submitted that the formula requires more thought because it imposes the highest relative registration cost share on two classes of buses. It argued that this seems the opposite of what a cost-driven approach should produce. It questioned why a relatively safe mode such as buses, with established safety systems (including accreditation in most cases) is hit hard by the costs for a regulator. Instead, it submitted that the costs for a regulator should be highest on those who most need to be regulated, for reasons such as their poor safety record.

4.14.7 Conclusion and recommendations

It is important to note that introducing a regulatory component of registration charges was introduced primarily as a mechanism to recover the cost of the NHVR's operations that are not subject to cost recovery through a set of yearly fees applying across the heavy vehicle fleet. One of the tasks that needed to be performed was to break the then existing registration charges into two components while separating out regulatory costs.

The formula to calculate the regulatory component of registration charges for each vehicle class was designed with the primary aim of achieving a reasonable outcome while maintaining the broad relativities of total registration charges between different vehicle classes.

The formula, and the resulting regulatory components of regulatory charges, was never intended to deliver an accurate price signal reflecting the safety record or other attributes of individual operators or types of operators. This is a goal that the current system could never achieve.

Therefore, the NTC continues to believe that the current mechanism achieves appropriate outcomes given the broad aim of the formula and the available data.

The NTC recommends that:

- regulatory charges for 2022–23 be reset using the existing methodology and the latest available information on weight (AGM), distance travelled (VKT) and the registered heavy vehicle fleet
- regulatory charges for subsequent years be automatically adjusted by scaling the 2022–23 regulatory charges up or down to recover the NHVR's approved budget
- the model law be updated to include processes and formulae necessary to implement the automatic update of regulatory charges.

5 Determination options

5.1 Options for consideration

The options for this determination were derived by combining all the recommended changes outlined in chapter 4 with the three key options for cost allocation explored in section 4.7.3.

The main reason for this approach is that, as explored in section 4.7.5, none of the three options for cost allocation is clearly and objectively superior to any other.

Therefore, this determination will evaluate a choice between the status quo and three alternative options, based mainly on the likely impact on heavy vehicle operators and governments (Table 19).

Table 19. Key determination options

Action	Detailed analysis and recommendations	Status quo	Option A	Option B	Option C
Updated treatment of innovative funding and financing mechanisms	Section 4.4	X	✓	✓	✓
Removal of MaxMan module	Section 4.8	X	✓	✓	✓
Adjustment for RUC leakages	Section 4.9	X	✓	✓	✓
Updated ESA values	Section 4.6	X	✓	✓	✓
Continued unsealed road travel discount	Section 4.10	X	✓	✓	✓
CSO discount removed	Section 4.11	X	✓	✓	✓
Future adjustments to take account of electric heavy vehicles	Section 4.13	X	✓	✓	✓
Updated regulatory component of heavy vehicle registration charges to recover heavy vehicle regulatory costs	Section 4.14	X	✓	✓	✓
Cost allocation approach	Section 4.7	Current	Current	Modified current	VIC DTF/ DOT

5.2 Comparison of determination options

5.2.1 Data

The final recommendations of this determination recommend heavy vehicle charges to apply in 2022–23, based on the latest data available at the time. This includes road expenditure data and the number of registered heavy vehicles for 2020–21, which have become available since the publication of the C-RIS. For this D-RIS, the latest available data is shown in Table 20.

Table 20. Latest available expenditure, usage and fleet data

Data	Source/year
State and territory road expenditure data	2020–21 as reported to the NTC by states and territories
Local government road expenditure data	2019–20 as reported by the ABS in government finance statistics
Road usage data, fuel usage data	2020 ABS SMVU
Vehicle numbers	State and territory registration databases, quarterly, averaged for 2020–21 financial year

5.2.2 Heavy vehicle cost base and implications for full cost recovery

Table 21 contains the allocated heavy vehicle cost base under the status quo and the three cost allocation options, based on the latest available usage and expenditure data.

Table 21. Allocated heavy vehicle cost bases

Measure	Updated status quo	Option A	Option B	Option C
Total road expenditure for allocation, 7-year EMA (\$m)	20,639	20,639	20,639	20,639
Heavy vehicle cost base (\$m)	4,363	4,217	4,516	4,919
Percentage of total expenditure allocated to heavy vehicles (%)	21.1	20.4	21.9	23.8

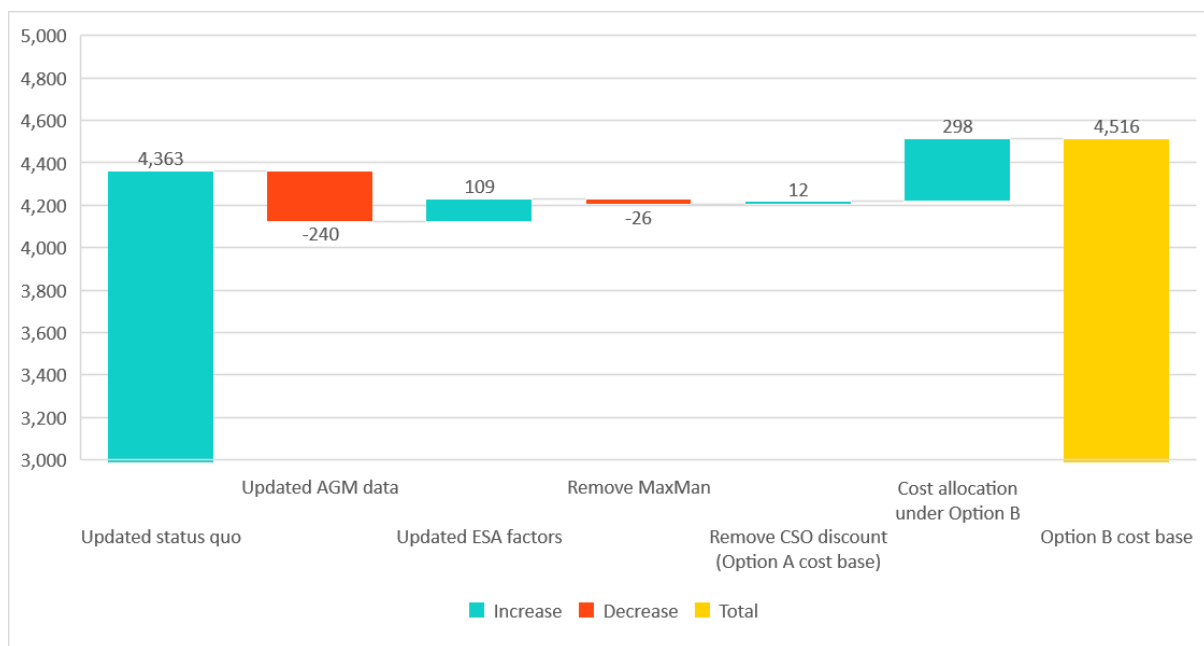
Note: Numbers in the updated status quo column use existing model settings from prior to the determination (e.g. applying MaxMan). This serves as a basis for comparison for options A, B and C, which incorporate the technical changes.

The status quo uses updated expenditure data and usage data from the 2020 SMVU but otherwise leaves the PAYGO model's settings unchanged from the previous determination.

Options A, B and C each have a different cost allocation approach, as well as making various changes to model settings in line with the recommendations in chapter 4. The impact of these changes on the heavy vehicle cost base is shown in Figure 8, with an endpoint of the cost allocation option B cost base.

The cost base under cost allocation option A (\$4.217 billion) is lower than the updated status quo, primarily due to incorporating AGM values for light vehicles (which more than offsets the increases that occur under various other changes). However, the cost allocation approach under option B adds \$298 million to the heavy vehicle cost, meaning that, overall, the cost base under this option has increased relative to the updated status quo. Note that each impact in Figure 8 has been calculated sequentially, in the order shown when moving from left to right.¹⁹

Figure 8. Impact on heavy vehicle cost base from changes considered in this D-RIS (\$m)



Using the VIC DTF/DOT cost allocation matrix increases the cost base by a further \$403 million to \$4.919 billion under the option C cost base.

5.3 Assessment of determination options

5.3.1 Economic considerations

As outlined in section 4.7.5, all three options are likely to fall within the wide range for achieving economic efficiency that lies between recovering a minimum of incremental cost and a maximum of standalone cost.

¹⁹ The impacts calculated would be different if calculated in a different order. For example, the impact of a revised cost allocation approach depends in part on the SMVU data (which determines the kilometre data for each of the cost allocation parameters) and on revisions to AGM and ESA factors.

From this perspective, there is no clearly superior option. However, the options would potentially have significantly different financial and economic impacts for governments and industry. The choice between determination options must therefore be based on an assessment of the overall impact of the option.

The identified heavy vehicle cost bases are \$4.22 billion for option A, \$4.52 billion for option B and \$4.92 billion for option C. Given that the cost base under all options is significantly above the revenue currently provided by heavy vehicle charges, it is unlikely that full cost recovery of the heavy vehicle cost base could be achieved immediately in 2022–23 under any of the three options.

Therefore, the short-term implications of any change in cost allocation approach are likely to be limited from an economic perspective.

5.3.2 Timing and Heavy Vehicle Road Reform

This determination is being undertaken while governments consider a suite of more wide-ranging reforms under the HVRR project. Under this reform it is likely that the entire process of setting heavy vehicle charges – including expenditure measurement, cost allocation and recovery of road costs over time – will be subject to change. There is a wide range of policy decisions, including how to allocate costs, which will need to be made as part of this reform. The reform will need to seek a balance between achieving productivity gains and managing the impact on heavy vehicle operators.

This determination under the PAYGO system may well be the last of its kind. It will need to provide a stable and well-reasoned platform on which future reform can be implemented.

There is a question whether a departure from the current cost allocators should be contemplated as part of this determination, or if such a significant change would best be considered as part of a wider range of significant changes under HVRR.

There are arguments supporting either proposition. On the one hand, if it is likely that a new cost allocation approach similar to option B or option C will be part of road reform, changing the cost allocators now may make implementation of HVRR easier. On the other hand, if a different approach is adopted as part of HVRR, any change implemented as part of this determination may then need to be reversed with the introduction of HVRR. The other advantage of introducing change as part of HVRR is that some or all of the effect could be mitigated through a decision on the level of the opening asset base of the FLCB.

5.3.3 Other issues

The report by HoustonKemp (2017) identified that road cost and use data generally suffers from shortcomings, which pose a challenge for evaluating the causal relationship between heavy vehicle road use and road costs. These challenges frequently lead to conflicting evidence and a general lack of consensus on fundamental elements on the relationships between heavy vehicle road use and road cost. It also found that new research was insufficient, in and of itself, to support a departure from the current cost allocators. This indicates that we can have some degree of confidence that the current cost allocators in option 1 and the modified current cost allocators in option 2 are reasonable approaches, albeit with recognised shortcomings.

The VIC DTF/DOT approach (ARRB, 2017a; ARRB, 2019) is an engineering-based approach using pavement deterioration models that link pavement deterioration to the millions of ESAs that pass over a particular pavement over time for key cost allocation parameters. There are some important features of this approach:

- The primary research focuses on load-related wear and construction and maintenance costs.
- The research is based on Victorian data only to date – it is uncertain whether the recommended cost allocators would be representative of the national road network.

5.3.4 Basis for decision

Based on the analysis presented above, we believe there is no clearly superior cost allocation approach from an economic perspective. Therefore, the choice of cost allocation approach needs to be made by seeking the appropriate trade-off between the following factors:

1. Resulting revenue gap and practical implications – changing the cost allocation approach will increase the heavy vehicle cost base compared with the current approach. Given the current gap between heavy vehicle charges revenue and the heavy vehicle cost base, changing the cost allocation matrix may only have a symbolic practical effect if full cost recovery cannot be achieved immediately.
2. Confidence in the robustness of options – each option has strengths and weaknesses and is based on a range of assumptions. The choice between the options needs to consider the degree of confidence in the research, assumptions and judgements and possible information gaps inherent in each approach.
3. Timing and HVRR – governments are developing options for HVRR that will replace the current PAYGO system over time. Is now the appropriate time to implement significant changes to the cost allocation approach, or should this be considered as part of HVRR?

5.3.5 Summary of submissions

The ALC submitted that it does not support any change to the cost allocators at this point in time. However, if PAYGO were to become permanent, the ALC indicated that the VIC DTF/DOT approach (option C) should be considered as a positive move towards a more average cost mechanism.

Neither the ATA nor NatRoad supported any change to the cost allocation approach as part of this determination, with NatRoad highlighting that the cost base under any option is higher than the industry could absorb. The ATA also highlighted that HoustonKemp concluded that it would be reasonable to maintain the existing allocation approach in the PAYGO matrix, and said that, in its opinion, there exists no strong evidence for departing from the existing approach at this time.

In respect of option C, the ATA stated that it should not be used in the 2021 determination but that this option may, with further development, make a valuable contribution to the future debate about heavy vehicle charging.

The ARTC supported a change to option C, noting that the ARTC has been subject to extensive reviews by the Australian Competition and Consumer Commission, with a focus on ensuring costs are allocated to cause and ideally based on detailed engineering assessments. This, the ARTC submitted, would support the use of option C (VIC DTF/DOT) for cost allocation as the most accurate available allocation methodology. The ARTC further argues that the resulting higher cost base still remains considerably short of the standalone cost base.

The BIC supported a move to option B but noted its concerns that allocating costs using ESA-km as a cost allocation parameter has a particularly severe effect on buses. It also highlighted that option C allocates a lesser proportion of total costs on the basis of ESA-km than the other options.

Philip Laird noted that the current percentage of total expenditure allocated to heavy vehicles is higher at 22.5 per cent than option A, which allows the allocated heavy vehicle cost base to fall to 21.7 per cent. Option A should therefore be rejected. He is also of the view that some truck classes receive operational subsidies, with an average deficit rate on road cost recovery from articulated freight vehicles of at least 1.25 cents per net tonne kilometre.

5.3.6 NTC response to submissions

The NTC notes that stakeholders have varied views on the advantages and disadvantages of the three cost allocation options and that there is no single option that meets all stakeholder preferences.

We also note that, as a matter of principle, the NTC must use its best endeavours to estimate a heavy vehicle cost base as accurately as possible. Therefore, the choice of a cost allocation methodology cannot be driven primarily by affordability concerns. Such concerns are better addressed through implementation pathways.

While option C offers the unique feature of being based on recent engineering research, it suffers from being based on Victorian data only. This approach also has not been peer reviewed. The NTC believes that this option would need to be expanded to include national data, and subjected to peer review, before it could be used to allocate costs for a national road network.

This results in the key decision being whether to keep the current cost allocators (option A), or to change them to reflect the option highlighted in the HoustonKemp report of moving to ESA-km to allocate 70 per cent of costs for periodic surface maintenance of roads under option B.

Based on currently available information, the NTC considers that ESA-km is currently the best available cost allocation factor to represent the relationship between heavy vehicle use of a road and road wear. It is widely accepted that the relationship between axle weights and deterioration of the road surface and pavement is exponential as represented by the fourth power rule. Therefore, using ESA-km to allocate attributable surface maintenance costs is a better reflection of the underlying physical relationship than linear measures such as AGM-km or PCU-km.

5.4 Final recommendation

The NTC recommends that:

- option B (modified current) be adopted as the standard cost allocation approach in PAYGO from 2022–23 onwards
- the heavy vehicle cost base be set at \$ 4.516 billion for the 2022–23 charges year.

6 Implementation options

6.1 Implementation objectives

In designing an implementation pathway for the determination, the overall objective is to achieve full cost recovery over time while complying with the pricing principles.

The pricing principles are:

‘National heavy vehicle road use prices should promote optimal use of infrastructure, vehicles and transport modes.

This is subject to the following:

- full recovery of allocated infrastructure costs while minimising both the over and under recovery from any class of vehicle
- cost-effectiveness of pricing instruments
- transparency
- the need to balance administrative simplicity, efficiency and equity (e.g. impact on regional and remote communities/access)
- the need to have regard to other pricing applications such as light vehicle charges, tolling and congestion.’

Following the Productivity Commission’s inquiry into road and rail infrastructure pricing in 2006, the ATC provided further direction to the NTC:

ATC direct the NTC, in developing its determination, to apply principles and methods that ensure the delivery of full cost recovery in aggregate, further develop indexation adjustment arrangements to ensure the ongoing delivery of full expenditure recovery in aggregate and remove cross subsidisation across different heavy vehicle classes, recognising that transition to any new arrangement may require a phased approach (ATC, 2007).

Whether the over- and under-recovery of any class of vehicle is being minimised has been interpreted as a requirement that the average total heavy vehicle charges paid by the average vehicle in a class should exceed the average attributable cost for this vehicle type.

The PAYGO model uses a constraint check table to indicate whether this is being achieved. Under the current structure of heavy vehicle charges, there are several vehicle types where the charges revenue paid is lower than the attributable cost. Avoiding cross-subsidies between different vehicle classes would therefore require the relative size of registration charges between different vehicle classes to change.

6.2 Historical approach to implementing determinations

Historically, a specific set of heavy vehicle charges would be implemented in the financial year following ministers’ approval of the determination. An annual adjustment process would then apply between determinations to ensure heavy vehicle charges revenue kept up with changes in government expenditure.

The annual adjustment initially applied only to registration charges. Over time, this led to an increasing proportion of heavy vehicle charges revenue being recovered through registration charges, whereas the proportion recovered through RUC reduced over time. To avoid this occurring, ministers agreed as part of the 2007 determination that annual adjustments would apply to registration charges and to RUC.

The annual adjustment was calculated and applied automatically, based on a formula outlined in the Heavy Vehicle Charges Model Law.

Under normal circumstances, this would be the most obvious approach to implementing the heavy vehicle charges approved by ministers as part of this determination.

6.3 Direct implementation may not be feasible

The cost bases for all three options, as shown in Table 21, exceed the revenue that would be collected if current heavy vehicle charges were frozen at 2021–22 levels by between 22.6 per cent and 43.0 per cent.²⁰

Two key factors have contributed to the gap between estimated revenue and the cost bases outlined above increasing compared with those shown in the C-RIS. First, the total road expenditure reported for 2020–21 has increased by \$3.87 billion or 15.4 per cent compared with 2019–20. Also, we have now adjusted the estimated RUC revenue by 4 per cent to account for exemptions for fuel used to power auxiliary equipment, as discussed and recommended in section 4.9.

It may not be possible to implement the determination directly for the following reasons:

- ITMM has historically been reluctant to approve large increases in heavy vehicle charges.
- The economic consequences of a significant increase in heavy vehicle charges may be more severe than usual in the uncertain economic climate post COVID-19.
- Heavy vehicle operators may not be able to pass on significant increases in heavy vehicle charges to their customers, particularly with the relatively short lead time inherent in a direct implementation approach.

On the other hand, full cost recovery over time is one of the most important principles underpinning PAYGO. Therefore, alternative implementation options should at least be able to achieve some progress towards full cost recovery, even if this is not achieved immediately.

6.4 Multi-year price periods

Setting charges for multiple years would allow the transition to full cost recovery to begin at a measured pace in a way that recognises the cost recovery principle underpinning PAYGO while also recognising that moving to full cost recovery immediately would impose an unreasonable burden on heavy vehicle operators.

²⁰ Estimated revenue if 2021–22 charges were frozen and applied in 2022–23 is \$3.44 billion (including the estimated revenue loss due to RUC leakages). The cost base under option A is \$4.22 billion, while under option C it is \$4.92 billion.

Agreeing a multi-year price path would also have the potential to reduce administrative and compliance costs for governments and industry.

Recent experience with the need to revisit heavy vehicle charges each year shows this is distracting to both governments and industry and consumes significant administrative resources. These costs could be avoided, at least in part, with a defined multi-year price path.

A defined price path may offer additional advantages in that it would provide industry with certainty about the heavy vehicle charges that would apply in the medium term, allowing vehicle operators to make better pricing decisions and reflect them in contracts.

One of the key questions is: How long should any multi-year price path be?

6.4.1 Specifying the multi-year pricing period

There are trade-offs in deciding on the length of a multi-year pricing period, and the rate of increase to apply:

- Determinations occur approximately every five to seven years. This timeframe is the practical upper limit of a multi-year pricing period.
- It is possible that HVRR will be implemented in the medium term. Shorter pricing periods are more likely to support smooth reform implementation.
- Shorter pricing periods provide less certainty, whereas longer periods provide greater certainty for both industry and governments.
- Longer pricing periods involve a higher risk that the heavy vehicle cost base and the revenue from heavy vehicle charges drift apart, increasing the potential for over- or under-recovery to increase over the pricing period.
- Any percentage increase set below the long-run growth in the heavy vehicle cost base is likely to result in the gap between the heavy vehicle cost base and heavy vehicle charges revenue growing over time rather than reducing.
- The year-on-year growth in the heavy vehicle cost base is highly variable and difficult to forecast.

Any multi-year price path must be set with these considerations in mind. We recommend exploring options for a three-year price path as the best compromise between providing certainty and reducing the risk of the gap between the heavy vehicle cost base and heavy vehicle charges revenue widening significantly during the price period.

Under this approach, ITMM would set prices for three years as part of its decision on the determination. The NTC would continue to collect data and provide an annual report to ITMM comparing the actual cost base with the revenue from heavy vehicle charges in each year of the pricing period. At the end of the pricing period, the NTC would provide a report on outcomes and recommendations for setting prices for the next three-year period.

The heavy vehicle charges set under this methodology could be replaced at any time with charges set under a new methodology introduced as part of HVRR.

6.5 Initial evaluation of implementation options

As part of this determination, we are assessing two implementation approaches. These are based on the NTC's recommendation that ITMM agrees to implement cost base option B. However, these implementation options could be pursued under all cost base options:

- direct implementation in 2022–23 with automatic annual adjustments to ensure full recovery of the identified heavy vehicle cost base in subsequent years
- three-year price path with a fixed percentage increase each year. Any percentage increase could be applied under this implementation option. To be able to explore the financial implications, two alternative pathways are presented:
 - pathway 1: increases of 2.75, 3.0 and 3.5 per cent per annum, respectively, over the three years
 - pathway 2: increases of 6 per cent per annum over the three years.

Direct implementation represents the status quo. The increases of 2.75, 3.0 and 3.5 per cent shown in pathway 1 of the three-year fixed price path option are intended to reflect a moderate approach that strikes a balance between stakeholder views on the industry's capacity to pay and the cost recovery principles. In the C-RIS, this example was specified as three equal yearly increases of 3.5 per cent. The NTC revised this pathway in light of stakeholder feedback as outlined in section 6.6.4. The 6 per cent yearly increase in pathway 2 of the three-year fixed price path option would see charges increase at a faster rate in an attempt to move closer to full cost recovery over time.

For direct implementation, the NTC has retained the existing RUC revenue to registration revenue ratio from 2021–22 of 56.6 per cent RUC revenue and 43.4 per cent registration revenue (from the roads component of registration charges). That is, the RUC rate is calculated as the rate needed to recover 56.6 per cent of total revenue from fuel used by heavy vehicles (where total fuel used by heavy vehicles has been reduced by 4.0 per cent to reflect estimated RUC leakages).

Registration charges under the direct implementation option are set to recover 43.4 per cent of total revenue and to maintain existing charge relativities between different types of vehicles and trailers where possible. However, registration charges for some types of powered units need to increase significantly to meet the calculated attributable costs for the relevant vehicle class and therefore avoid cross-subsidisation between vehicle classes.²¹ Where increases to registration charges are necessary to avoid cross-subsidisation, they have been kept as low as possible while still satisfying the constraints check. Nonetheless, the necessary increases to registration charges to avoid cross-subsidisation are, in some cases, very large, which is primarily due to the revised ESAs, along with changes in usage data from the SMVU.

Both pathways of the three-year fixed price path specify fixed percentage increases in overall heavy vehicle charges. However, in calculating the charges to apply under these implementation options, the NTC has had regard to the pricing principle relating to cross-subsidisation. This is done by allowing for differential rates of increase in the charges for different types of powered units and trailers while maintaining the same overall revenue as would be achieved from a 2.75, 3.0 and 3.5 per cent (under pathway 1) or 6 per cent (under pathway 2) charge increase applied to all powered units and trailers. That is, certain charges increase faster (1.5 percentage points higher²²) than the specified annual percentage figure for the implementation pathway to help reduce the degree of cross-subsidisation (while still retaining some pragmatism about the rate of increase in charges that can be implemented

²¹ In a very small number of cases (primarily affecting short combination trucks), charges have also been increased to maintain the relativities logic in the charging schedule (e.g. type 2 trucks should cost more than type 1), even though they would not otherwise have been in breach of the cross-subsidisation pricing principle.

²² That is, by 4.25 per cent, 4.5 per cent and 5.0 per cent for each year under pathway 1; and 7.5 per cent each year under pathway 2.

for those vehicle classes). Charges for other types of vehicle and trailer increase by less than the specified figure (around 2.6, 2.8 and 3.3 per cent across the three years under pathway 1; and around 5.8 per cent each year under pathway 2). Overall, the amount of revenue collected nationally is the same as if the headline increases had been applied uniformly to all powered units and trailers under the two pathways of the three-year fixed price path.²³

6.6 Assessment of implementation options

6.6.1 Financial and fiscal implications

Financial and fiscal outcomes will differ under each implementation option, and for each pathway.

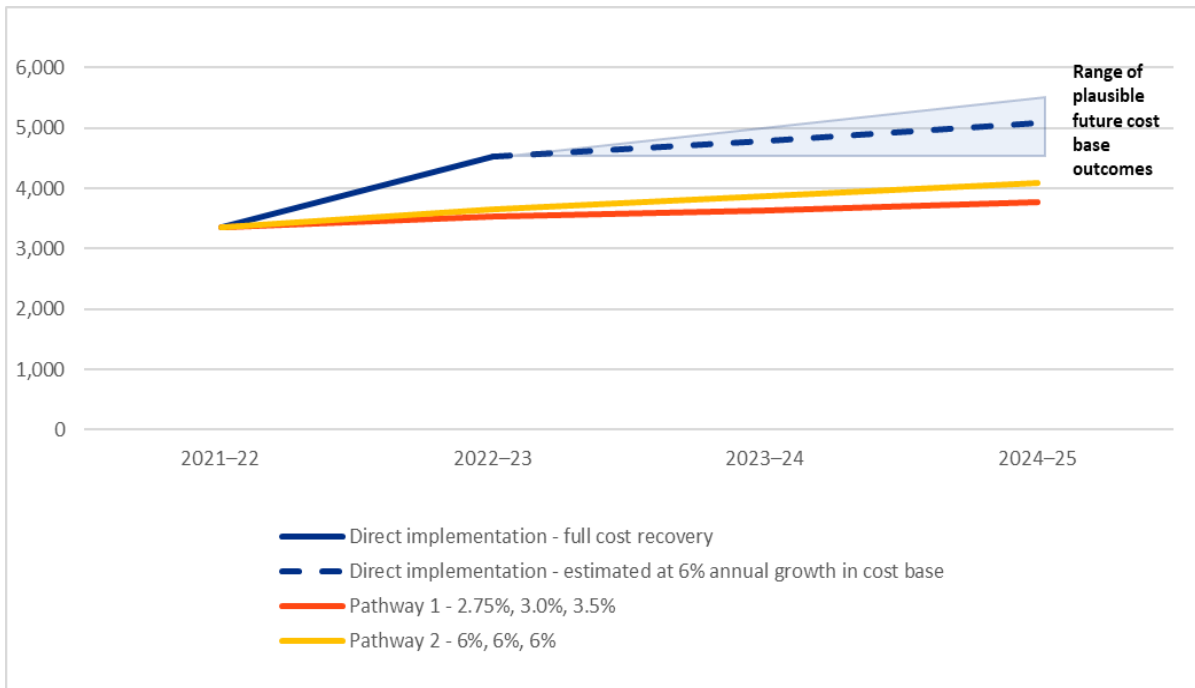
To illustrate the outcomes, we start with the current gap between the heavy vehicle cost base and revenue. The heavy vehicle cost base in future years is not yet known, as illustrated by the shaded area shown in Figure 9. The broken line represents an example where the cost base grows at 6 per cent per annum. We then compare the charges outcomes under the three implementation options against the estimated heavy vehicle cost base.

It is important to note that this representation is illustrative only. Annual changes in heavy vehicle expenditure are typically volatile and unpredictable. Also, the vehicle fleet and fuel consumption typically grow from year to year, which would increase revenue further from the levels shown in the figure.

The estimates of RUC revenue shown in this section reflect the revised estimate of heavy vehicle fuel consumption that is subject to the RUC, based on the analysis of RUC leakages in section 4.9. As a result, the estimate of fuel used by heavy vehicles has been reduced by 4 per cent. Under the direct implementation option, this reduction of fuel subject to the RUC is factored into the calculation of the RUC rate (to ensure 56.6 per cent of total revenue from heavy vehicles is sourced from the RUC). By contrast, for the two pathways of the three-year fixed price implementation pathway, the RUC leakages are simply reflected in lower estimated revenue due to the lower volume of fuel that is subject to the RUC.

²³ While the amount of revenue collected nationally is the same under a uniform or differential increase, there would be differences in the revenue collected by an individual jurisdiction because the mix of the fleet registered in each jurisdiction will affect relative outcomes.

Figure 9. Projected financial implications for heavy vehicle charge revenue (\$m)



Under the direct implementation option, heavy vehicle charge revenue would need to increase by around 31.3 per cent (relative to revenue collected if 2021–22 charges were frozen) in year 1 to fully eliminate the existing under-recovery.²⁴ However, this overall figure masks significant variation because the RUC rate would increase by around 35 per cent (in part to compensate for RUC leakages), while registration charges would in some cases rise by several hundred per cent. Further automatic annual adjustments would follow in years 2 and 3. The magnitude of these increases is not known and would depend on future changes in the heavy vehicle cost base. For illustration purposes, we have assumed these increases to be 6 per cent, which reflects the average overall road expenditure growth rate over the past 10 years. This implementation option would achieve full cost recovery in all three years.

Under pathway 1 of the three-year fixed price path, heavy vehicle charges would increase by an average of 2.75, 3.0 and 3.5 per cent in each of the three years (with registration charges increasing by 4.25, 4.5 and 5.0 per cent for some types of powered units; and by around 2.6, 2.8 and 3.3 per cent for trailers and other types of powered units).

Under pathway 2 of the three-year fixed price path, heavy vehicle charges would increase by an average of 6 per cent in each of the three years (with registration charges increasing by 7.5 per cent for some types of powered units and by around 5.8 per cent for trailers and other types of powered units). The gap between the estimated heavy vehicle cost base and heavy vehicle charges would remain broadly static if the heavy vehicle cost base continues to grow at historical rates. This is a simple reflection that the yearly increase under this option is set at the same rate as the assumed growth in the heavy vehicle cost base.

It is important, again, to note that actual outcomes for the heavy vehicle cost base in 2023–24 and 2024–25 are likely to be different from the central estimate shown in Figure 9.

²⁴ The cost base under option B is \$4.52 billion, while estimated revenue collected from heavy vehicle charges in 2022–23 if the previous year’s charges were frozen is \$3.44 billion (this figure includes the estimated impact on revenue of RUC leakages).

This is illustrated by the wide range of plausible cost base outcomes shown by the blue shaded area.

Table 22 shows the estimated revenue from the roads component of registration charges that would be received by each state and territory under the recommended cost base option (option B), which uses the modified cost allocation matrix (as recommended by HoustonKemp) and the direct implementation option.

Table 22. Estimated revenue from the roads component of registration charges and RUC – direct implementation (\$m)

Direct implementation	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Cwlth	Total
Year 1	464.9	505.1	453.3	152.4	313.1	39.7	25.5	5.9	2,556.0	4,515.9
Year 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Year 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total over pricing period	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 23 and Table 24 show estimated revenues from the roads component of registration charges and the RUC under implementation options 1 and 2. For modelling purposes, the heavy vehicle and trailer fleet and fuel use have been assumed to be constant throughout the modelling period; in practice, outcomes will differ due to changes in the fleet and fuel use over time.

Table 23. Estimated revenue from the roads component of registration charges and RUC – three-year fixed price pathway 1: up to 3.5 per cent per annum (\$m)

Pathway 1: up to 3.5% per annum	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Cwlth	Total
Year 1	371.8	413.1	372.3	124.9	257.1	31.2	20.9	3.9	1,939.7	3,534.9
Year 2	383.1	425.5	383.4	128.6	264.8	32.2	21.5	4.0	1,997.9	3,640.9
Year 3	396.6	440.3	396.7	133.1	274.1	33.3	22.2	4.2	2,067.8	3,768.4
Total over pricing period	1,151.5	1,278.9	1,152.4	386.6	796.0	96.8	64.6	12.1	6,005.4	10,944.2

Table 24. Estimated revenue from the roads component of registration charges and RUC – three-year fixed price pathway 2: 6 per cent per annum (\$m)

Pathway 2: 6% per annum	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Cwth	Total
Year 1	383.6	426.2	384.0	128.8	265.2	32.2	21.5	4.0	2,001.0	3,646.7
Year 2	406.7	451.7	407.0	136.6	281.1	34.2	22.8	4.3	2,121.1	3,865.5
Year 3	431.2	478.8	431.4	144.7	298.0	36.3	24.2	4.5	2,248.4	4,097.4
Total over pricing period	1,221.5	1,356.6	1,222.4	410.1	844.4	102.7	68.5	12.8	6,370.5	11,609.6

Table 25 shows the estimated revenue from the regulatory component of registration charges, which have been set to recover the NHVR's indicative budget – as published in the NHVR's corporate plan (NHVR, 2021) – assuming the heavy vehicle and trailer fleet remain constant throughout the three years. In practice the NHVR's budget is subject to approval at ITMM, so the amounts to be recovered in years 2 and 3 may differ from those assumed. Further, changes to the size of the registered heavy vehicle fleet in participating jurisdictions would affect the charges necessary to recover the NHVR's budget, so charges modelled here should be treated as indicative.²⁵

Table 25. Estimated revenue from the regulatory component of registration charges (\$m)

Regulatory component	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Cwth	Total
Year 1	50.4	50.7	44.2	15.1	0.0	4.7	0.0	0.8	N/A	165.9
Year 2	51.9	52.3	45.5	15.6	0.0	4.8	0.0	0.8	N/A	170.9
Year 3	53.5	53.8	46.8	16.1	0.0	5.0	0.0	0.9	N/A	176.0
Total over pricing period	155.7	156.8	136.5	46.8	0.0	14.4	0.0	2.5	0.0	512.9

²⁵ Given that the registered heavy vehicle fleet has tended to grow over time – but has been assumed to remain constant for modelling purposes here – the charges in years 2 and 3 may be expected to be lower than the indicative charges modelled here (unless the NHVR's approved budget increases at a faster rate than the fleet).

6.6.2 Impact on industry

Road user charge

Table 26 shows the estimated RUC in cents per litre of diesel fuel that would apply over the first three years of this determination under the three implementation options. The RUC rate is significantly higher under the direct implementation option than it is currently due to both the higher cost base and the need to increase the RUC rate to make up for the shortfall in revenue arising from RUC leakages. Under the other two implementation options, the RUC rate is simply increased by the specified percentage with no adjustment for RUC leakages. (However, the estimates of RUC revenue in Table 23 and Table 24 reflect the lower amount of fuel estimated to be subject to RUC.)

Table 26. Road user charge under current cost allocation option for each implementation option (cents per litre)





Implementation option	Year 1	Year 2	Year 3
Direct implementation	35.8	N/A	N/A
Three-year fixed price pathway 1: up to 3.5% per annum	27.2	28.0	29.0
Three-year fixed price pathway 2: 6% per annum	28.0	29.7	31.5

Registration charges for common vehicle types (including roads and regulatory components)

Tables 27–29 show the estimated registration charges (including both roads and regulatory components) that would apply under the three implementation options over the three years following the determination. Under the direct implementation option, charges for the second and third year are not known because they depend on future expenditure and usage data.

As noted in section 6.6.1, the regulatory component of registration charges for years 2 and 3 (2023–24 and 2024–25) are indicative only; final charges would be available once the NHVR's approved budget and vehicle fleet numbers are known in future years.

Table 27. Registration charges for common vehicle types: direct implementation

Vehicle type	Mass rating for charging	Current (2021–22)	Year 1	Year 2	Year 3
	Up to 12.0 t	617	687	N/A	N/A
	Over 12.0 t	993	1,717	N/A	N/A
	Up to 42.5 t	2,334	3,233	N/A	N/A
	Up to 16.5 t	968	1,691	N/A	N/A
	Over 16.5 t	1,162	1,987	N/A	N/A
	Up to 42.5 t	3,135	4,221	N/A	N/A
	Over 42.5 t	11,713	13,374	N/A	N/A









Vehicle type	Mass rating for charging	Current (2021–22)	Year 1	Year 2	Year 3
	Over 42.5 t	12,342	14,098	N/A	N/A
	Up to 20.0 t	983	1,723	N/A	N/A
	Over 20.0 t	1,183	2,033	N/A	N/A
	Up to 12.0 t	521	561	N/A	N/A
	Over 12.0 t	651	2,504	N/A	N/A
		2,731	7,841	N/A	N/A
		6,369	7,239	N/A	N/A
		15,102	17,178	N/A	N/A
		15,158	17,234	N/A	N/A
		16,969	19,300	N/A	N/A

Table 28. Registration charges for common vehicle types: three-year fixed price pathway 1: up to 3.5 per cent per annum








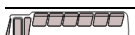
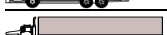










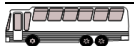




Vehicle type	Mass rating for charging	Current (2021–22)	Year 1	Year 2	Year 3
	Up to 12.0 t	617	635	653	675
	Over 12.0 t	993	1,031	1,074	1,123
	Up to 42.5 t	2,334	2,389	2,471	2,565
	Up to 16.5 t	968	1,005	1,047	1,095
	Over 16.5 t	1,162	1,208	1,257	1,315
	Up to 42.5 t	3,135	3,205	3,312	3,436
	Over 42.5 t	11,713	11,999	12,342	12,750
	Over 42.5 t	12,342	12,644	13,006	13,436
	Up to 20.0 t	983	1,037	1,081	1,130
	Over 20.0 t	1,183	1,254	1,305	1,364
	Up to 12.0 t	521	522	537	555
	Over 12.0 t	651	688	715	744
		2,731	2,824	2,946	3,086
		6,369	6,501	6,686	6,907
		15,102	15,421	15,861	16,384
		15,158	15,477	15,917	16,440
		16,969	17,330	17,821	18,404

Table 29. Registration charges for common vehicle types: three-year fixed price pathway 2: 6 per cent per annum

Vehicle type	Mass rating for charging	Current (2021–22)	Year 1	Year 2	Year 3
	Up to 12.0 t	617	649	681	716
	Over 12.0 t	993	1,055	1,123	1,196
	Up to 42.5 t	2,334	2,455	2,602	2,756
	Up to 16.5 t	968	1,029	1,096	1,168
	Over 16.5 t	1,162	1,235	1,313	1,397
	Up to 42.5 t	3,135	3,295	3,491	3,695
	Over 42.5 t	11,713	12,359	13,060	13,797
	Over 42.5 t	12,342	13,025	13,765	14,542
	Up to 20.0 t	983	1,061	1,130	1,203
	Over 20.0 t	1,183	1,281	1,361	1,446
	Up to 12.0 t	521	532	558	585
	Over 12.0 t	651	698	736	775
		2,731	2,899	3,099	3,314
		6,369	6,695	7,072	7,470
		15,102	15,882	16,779	17,727
		15,158	15,938	16,835	17,783
		16,969	17,848	18,850	19,909

Schedules of estimated registration charges for the full range of vehicle types and components are outlined in Appendix B.

6.6.3 Heavy vehicle operating costs as context

The operating costs for heavy vehicles included in the model are registration, RUC, insurance, maintenance, tyres, fuel, capital, labour, administration and sundry costs related to running a business. Many of these costs will not be affected by the proposed implementation options. The main impacts will be on RUC and registration. However, both RUC and registration represent a minor proportion of overall costs, as depicted in Table 30 and Figure 10. Table 30 shows examples of seven vehicle classes and the proportion of cost represented by RUC and registration based on 2020 costs.

Table 30. Charges relative to operating costs for selected heavy vehicles

Vehicle type	Registra- tion	RUC	Total charges	Total costs	Registration/ total costs	Charges/ total costs
Rigid truck 2-axle 4.5 to 7.0 t	\$607	\$1,835	\$2,442	\$144,324	0.4%	1.7%
Rigid truck 3-axle 18 t and over	\$1,142	\$4,378	\$5,520	\$185,333	0.6%	3.0%

Vehicle type	Registration	RUC	Total charges	Total costs	Registration/total costs	Charges/total costs
Truck and trailer over 42.5 t	\$6,492	\$9,184	\$15,676	\$309,891	2.1%	5.1%
6-axle articulated truck	\$6,225	\$26,212	\$32,437	\$484,362	1.3%	6.7%
9-axle B-double	\$14,472	\$37,256	\$51,728	\$631,934	2.3%	8.2%
Double road train	\$14,815	\$42,043	\$56,858	\$769,601	1.9%	7.4%
Triple road train	\$16,584	\$52,017	\$68,601	\$911,797	1.8%	7.5%

Figure 10. Changes in operating costs from 2013 to 2020

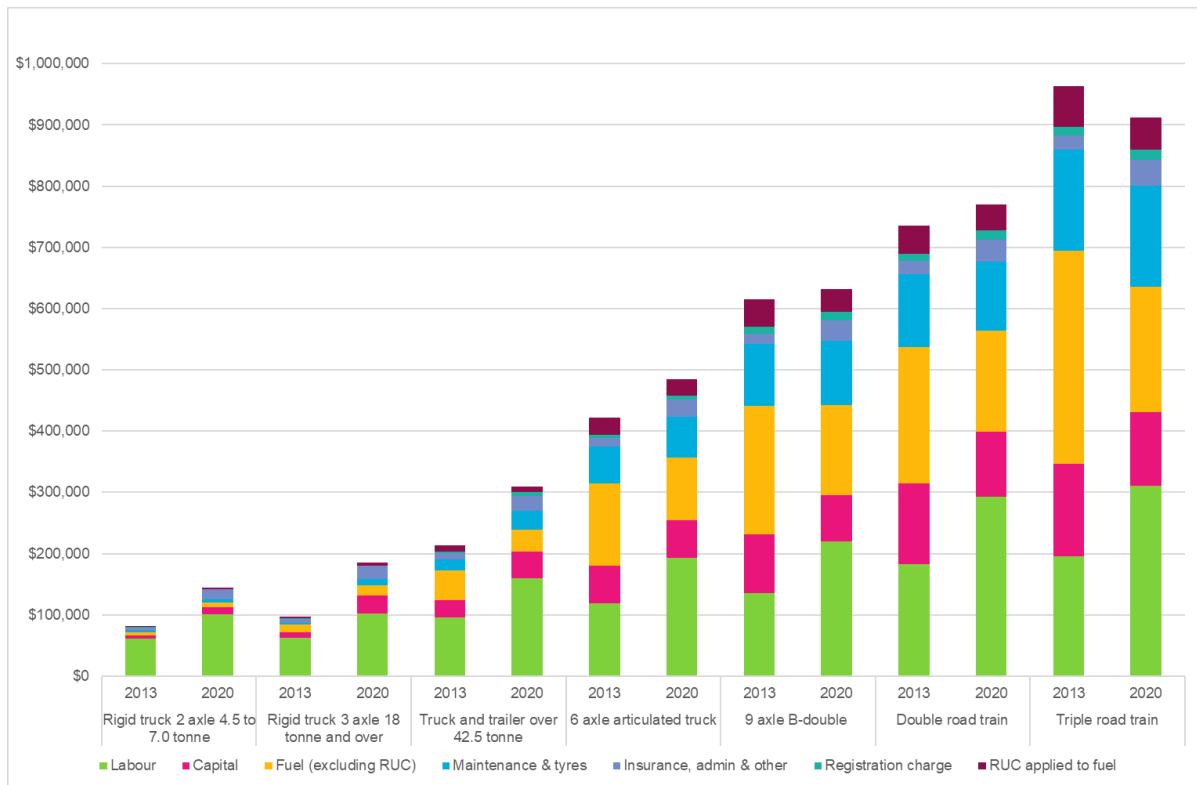


Figure 10 illustrates that operating costs have changed since 2013, in some cases significantly. Key observations from the review of the operating cost model were:

- Labour costs have increased significantly because it reflects the most recent award and includes costs not considered in the previous model.
- Fuel costs have decreased because the pump price for diesel excluding fuel excise has declined.
- Vehicle and capital costs have remained largely the same as the increase in market prices and inclusion of stamp duty have been largely offset by lower financing rates.

- The tyre/maintenance costs have increased significantly for some vehicle types (e.g. rigid vehicles and buses) to reflect costings in the Australian Transport Assessment and Planning guidelines and stakeholder feedback.
- Other costs have increased to cover costs previously not considered in the model – for example, compliance training, parking and tolls and the introduction of new technology such as electronic work diaries.

From the information above, we can conclude that a modest change in heavy vehicle charges would have a relatively modest impact on overall heavy vehicle operating costs. For example, for a 9-axle B-double, where current heavy vehicle charges make up 8.2 per cent of total operating costs, a 3.5 per cent increase in heavy vehicle charges would be likely to increase total operating costs by less than 0.3 per cent.

There are important limitations to the above analysis in that it relates to the average vehicle in a particular heavy vehicle class. Individual vehicles, particularly those operating in rural and remote areas, are likely to experience higher operating costs due to the wear and tear caused by the poorer quality of roads (e.g. unsealed) that these vehicles travel on.

6.6.4 Summary of submissions

No submitters supported the direct implementation option. Many submitters highlighted that this option would impose an unmanageable burden on industry. The BIC, in particular, commented on the significant increases for bus registration charges that would occur under the direct implementation option and highlighted that this increase would fall on state or territory government budgets for those buses operating under state route bus operating contracts. The BIC also highlighted that the increase in RUC from 26.4 cents per litre to 32.2 cents per litre (as estimated in the C-RIS) associated with the direct implementation pathway is a significant increase of 22 per cent, and highlighted that such an increase would impose a shock on business costs.

The ATA noted that the economic consequences of a significant increase in heavy vehicle charges may be more severe than usual, and that heavy vehicle operators may not be able to pass on significant increases in heavy vehicle charges. In particular, responses to the ATA's 2021 truck charges survey found limited ability to pass on increases in heavy vehicle charges, with:

- 16 per cent of the businesses surveyed saying they could pass on (increases in) registration changes
- 34 per cent saying they could pass on fuel price changes
- 13 per cent saying they could pass on both registration and fuel price changes.

The ALRTA was mindful of the market's current ability to absorb price increases. Its submission highlighted that, after a significant period of unforeseen disasters including drought, fire, floods and disease pandemic, there are many customers unable or unwilling to absorb increases above CPI. Also, at this stage, the focus of governments should be on supporting an economic recovery. Increasing charges on road transport will have a general negative impact on the cost of producing most goods and services in Australia.

Most submitters supported the concept of a three-year fixed price implementation pathway (ALC, ALRTA, ATA, the Australian Small Business and Family Enterprise Ombudsman and others). However, this support was in many cases conditional on the percentage increases adopted, and the amount of certainty that would be provided to industry.

The ATA proposed a three-year implementation pathway with 2 per cent, 3 per cent and 3 per cent. The pathway should be locked in for the full three years both for registration charges in the Heavy Vehicle Charges Model Law and for RUC under the Fuel Tax Act 2006. The ATA provided a legal opinion in its submission that supported the feasibility of the minister determining RUC rates for three years upfront.

NatRoad submitted that it would prefer that current charges be increased at the rate of inflation or 3.5 per cent (whichever is the lower) until the HVRR process delivers a new model for heavy vehicle charges. Alternatively, NatRoad supported the lower cost fixed price increase of 3.5 per cent set out in the C-RIS regardless of the particular interim model used.

In ALRTA's view, a reasonable price path over the next three years is 2.5 per cent, 3.0 per cent and 3.0 per cent.

The ARTC supported the 3-year price path implementation; provided that it is implemented in full, and not subject to later alteration or reversal. ARTC noted that this is critical as historical decisions to limit the full recovery of the cost base have contributed to excess consumption of the road network and the freight transport market failure that has resulted.

6.6.5 NTC response to submissions

The NTC understands and shares the concerns raised by submitters that direct implementation would impose an unmanageable burden on truck operators at this stage.

We also note the strong generic support for a three-year fixed price pathway, and the need to provide industry with as much certainty as possible. We agree that, if practicable, the three-year price pathway should be 'locked in' for three years to provide the greatest certainty to both governments and industry.

Further, we note the percentage increases in each year preferred by the ATA, ALRTA and NatRoad. These reflect the view that the industry and also the economy are still dealing with the effects of COVID-19 and other historical events such as bushfires. A return to relative normality will take time.

In response to stakeholder feedback, the NTC has re-calibrated the percentage increases under pathway 1 of the three-year implementation pathway from 3.5 per cent per year to increases of 2.75 per cent in year 1, 3.0 per cent in year 2 and 3.5 per cent in year 3. We recognise that this may not completely reflect the preferred price paths outlined by the ATA, ALRTA and NatRoad.

6.6.6 Overall assessment of implementation options

The pricing principles (see section 2.1.1 for full details) include the principle of fully recovering infrastructure costs while minimising both the over- and under-recovery from any class of vehicle. They also require us to consider administrative simplicity, efficiency and equity (e.g. impact on regional and remote communities/access).

Starting from the point where, currently, heavy vehicle charges revenue is below the identified heavy vehicle cost base, it is unlikely that any option that would permanently recover less than the identified cost base would comply with the principle of full cost recovery.

On the other hand, the need to consider efficiency and equity means that options that impose an undue burden on vehicle operators, such as large year-on-year changes, are likely to fail to comply with the efficiency and equity principles. Industry submissions have

made a strong case that heavy vehicle operators have only limited ability to pass on increases in heavy vehicle charges to their customers through price increases.

Overall, our initial interpretation of the combined pricing principles is that they would favour an implementation path that has the prospect of achieving some progress towards closing the gap between the identified heavy vehicle cost base and heavy vehicle charges revenue while, at the same time, keeping yearly increases to heavy vehicle charges within reasonable bounds. There is also a need to consider the ongoing impact of COVID-19 on the economy.

The direct implementation approach would immediately achieve full cost recovery. However, it would also require a significant increase in heavy vehicle charge revenue in the region of 31.3 per cent in the first year (relative to revenue collected under frozen charges). While fully achieving cost recovery principles, it would fall short on equity because of the likely severe impact on industry and, in particular, regional and remote communities.

Pathway 1 of the three-year fixed price path implementation approach (up to 3.5 per cent increase per annum) would minimise the impact on industry and makes some progress towards increasing heavy vehicle charges in line with the recent average yearly growth in the heavy vehicle cost base. While it is unlikely to fully comply with the cost recovery mandate provided by the pricing principles, it scores highly in terms of considering the impact on industry and regional and remote communities.

Pathway 2 of the three-year fixed price path implementation approach (6 per cent increase per annum) would make more rapid progress in closing the gap between the heavy vehicle cost base and heavy vehicle charges revenue over time. It would score more highly on achieving cost recovery than pathway 1 but lower than the direct implementation approach. The impact on industry of 6 per cent year-on-year increases in charges could still be severe, and it therefore scores lower than option 1 in terms of paying regard to equity concerns.

Overall, the trade-off between cost recovery and equity considerations is at least partially subjective. However, the NTC recommends that ITMM endorse pathway 1 of the three-year fixed price path as its preferred option. We consider that this option strikes a defensible balance between gradually increasing heavy vehicle charges towards full cost recovery while also recognising that heavy vehicle operators have only limited ability to cope with cost increases.

The NTC recommends that:

- ITMM endorse pathway 1 of the three-year fixed price path, with increases in heavy vehicle charges of 2.75 per cent in 2022–23, 3.0 per cent in 2023–24 and 3.5 per cent in 2024–25 as its preferred option for implementing this determination
- ITMM agree that the NTC undertake further consultation for 60 days on the preferred option for implementing the determination.

7 Final recommendations and next steps

7.1 Summary of final recommendations

This D-RIS contains a range of recommendations for technical changes to the PAYGO model, the choice of an option for cost allocation and for implementing heavy vehicle charges to apply from 2022–23 onwards.

Table 31 summarises the NTC’s final recommendations.

Table 31. Summary of recommendations

Section	Topic	Recommendations
4.2	Trust in expenditure data	<p>The NTC recommends that:</p> <ul style="list-style-type: none"> there be no change to expenditure auditing at this time the NTC should investigate whether additional certification requirements similar to those recommended by the ATA could be introduced at reasonable cost in the future.
4.3	Expenditure categories	<p>Based on the analysis in Table 5, the NTC recommends that:</p> <ul style="list-style-type: none"> the existing PAYGO expenditure categories should be retained the option of introducing new expenditure categories should be explored once a new set of expenditure categories is agreed under HVRR.
4.4	Treatment of innovative funding and financing models	<p>The NTC recommends that:</p> <ul style="list-style-type: none"> the NTC should change the expenditure reporting guidelines to account for tolled roads and any other types of innovative funding or financing models used by governments on a net neutral basis (Option 5) in accordance with the principles in section 4.4.4. the NTC should work with state and territory road agencies to assist them in reporting the relevant expenditures and revenues in accordance with the guidelines and principles.
4.5	Usage data	<p>The NTC recommends that:</p> <ul style="list-style-type: none"> the NTC should explore whether the current work undertaken by BITRE to replace the usage data previously sourced from the SMVU will provide suitable usage data for use in the PAYGO model in the future the NTC should collaborate with BITRE to develop an alternative source of usage data, if possible the NTC explore alternative options if it is unlikely that the current work undertaken by BITRE will provide the type of data needed to operate the PAYGO model within a suitable time frame.

Section	Topic	Recommendations
4.6	Review of ESA values	The NTC recommends that: <ul style="list-style-type: none"> the revised ESA values developed by PTT be adopted for use in the PAYGO model the NTC investigate adopting alternative values in the future, should better options become available, and report its findings to ITMM.
4.8	MaxMan	The NTC recommends: <ul style="list-style-type: none"> that MaxMan should be removed from the PAYGO model.
4.9	RUC leakages	The NTC recommends: <ul style="list-style-type: none"> implementing approach 2 in Table 15, as amended, which uses a conservative approach to produce an estimate of RUC exemptions using the ATO's 'fair and reasonable' fuel tax rate exemption rates. applying a reduction of 4 per cent to the estimates of total fuel consumption in the PAYGO model to reflect estimated RUC exemptions and arrive at an estimate of fuel that is actually subject to RUC.
4.10	Unsealed road travel discounts	The NTC recommends that: <ul style="list-style-type: none"> the current unsealed road travel discounts continue to be used in the PAYGO model the NTC investigate options to update the percentages used to calculate the unsealed road discount in PAYGO after the determination.
4.11	CSO discount	The NTC recommends that: <ul style="list-style-type: none"> the CSO discount be discontinued.
4.13	Electric vehicle fleet	The NTC recommends that: <ul style="list-style-type: none"> state and territory road agencies regularly provide data to the NTC on electric vehicles by type the NTC monitors the number of electric vehicles over time and assesses their impact on cost recovery for heavy vehicles under the current heavy vehicle charges over time the NTC makes this information available to states, territories, and the Commonwealth through ITMM the NTC provides an update to ITMM at the end of 2024.
4.14	Recovery of regulatory costs	The NTC recommends that: <ul style="list-style-type: none"> regulatory charges for 2022–23 be reset using the existing methodology and the latest available information on weight (AGM), distance travelled (VKT) and the registered heavy vehicle fleet regulatory charges for subsequent years be automatically adjusted by scaling the 2022–23 regulatory charges up or down to recover the NHVR's approved budget

Section	Topic	Recommendations
		<ul style="list-style-type: none"> the model law be updated to include processes and formulae necessary to implement the automatic update of regulatory charges.
5.4	Determination option	<p>The NTC recommends that:</p> <ul style="list-style-type: none"> option B (modified current) be adopted as the standard cost allocation approach in PAYGO from 2022–23 the heavy vehicle cost base be set at \$ 4.516 billion for the 2022–23 charges year.
6.6.6	Implementation option	<p>The NTC recommends that:</p> <ul style="list-style-type: none"> ITMM endorses pathway 1 of the three-year fixed price path, with increases in heavy vehicle charges of 2.75 per cent in 2022–23, 3.0 per cent in 2023–24 and 3.5 per cent in 2024–25 as its preferred option for implementing this determination ITMM agrees that the NTC undertakes further consultation for 60 days on the preferred option for implementing the determination.

7.2 Next steps

Ministers at the December 2021 ITMM will consider the NTC's final recommendations for the determination and identify a preferred option for heavy vehicle charges applying from 2022–23.

Following the meeting, ministers will consult further on the preferred option for heavy vehicle charges, in line with the requirements for consultation in the Fuel Tax Act. This is expected to occur in early 2022.

ITMM will then consider any submissions received on the preferred option and make a final decision on registration charges and RUC to apply from 2022–23.

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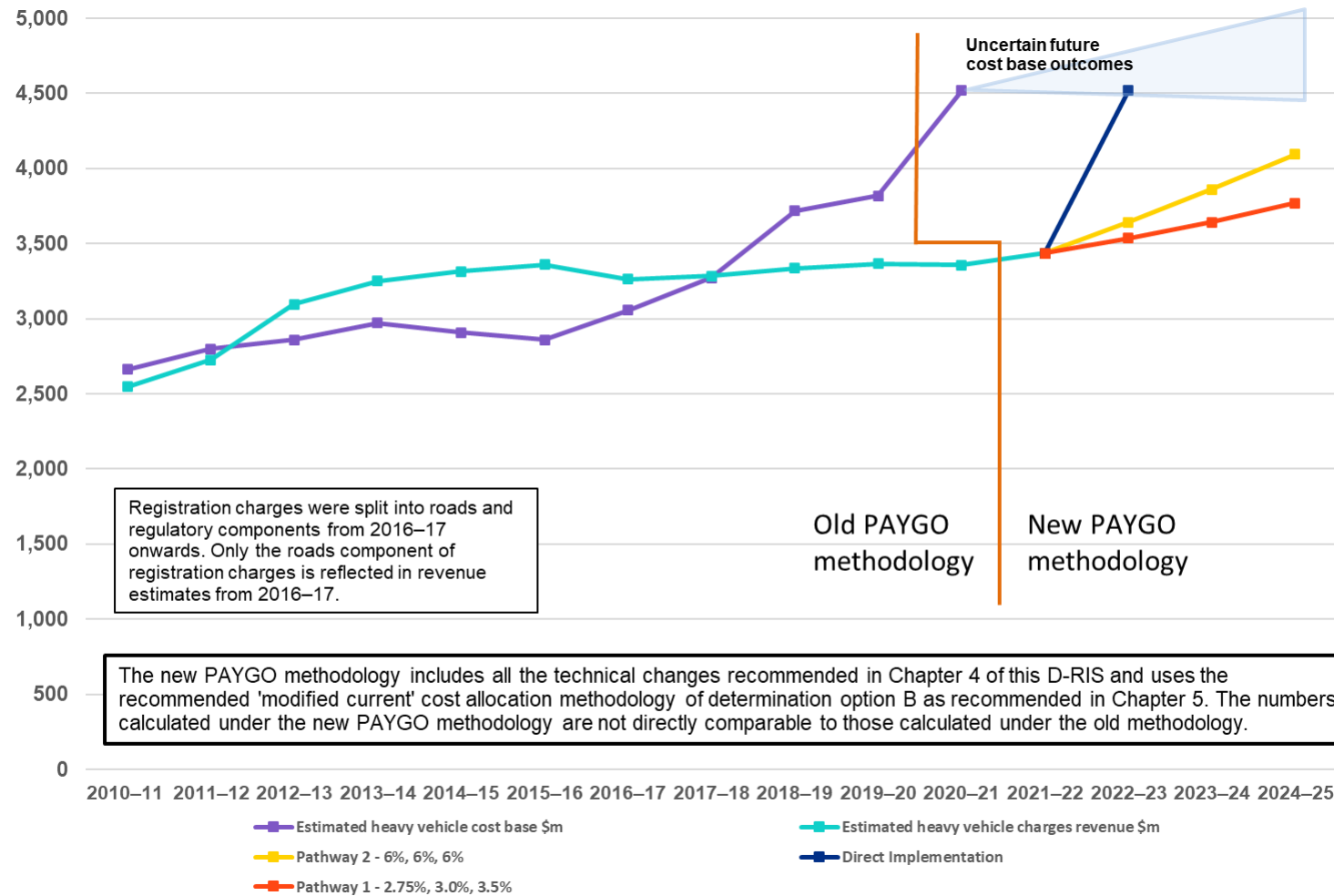
Glossary

Term	Definition
AGM	Average gross mass
Capital costs	Fixed, one-time expenses incurred on the purchase of land, buildings, construction and equipment used in the production and maintenance of roads. From an operator perspective, capital costs are the one-time costs of purchasing a heavy vehicle and investment in the infrastructure associated with running a heavy vehicle operation.
Community service obligation	In relation to roads, this relates to road expenditure undertaken with the primary aim of providing a minimum level of service to a community that may not be justified solely on the amount of traffic using the road. An example could be to maintain a road to a minimum standard to provide access to remote communities.
Cost allocators	The aspects of road construction and maintenance costs allocated to heavy vehicle use of the roads for cost recovery.
Cost allocation	The process of allocating road construction and maintenance costs to different types of vehicles using a cost allocation matrix and usage data.
ESA	Equivalent standard axle. ESA-km is a key cost allocator in the PAYGO model that is particularly significant for heavy vehicles. ESA values are a measure of the road wear caused by vehicles.
Expenditure categories	Road expenditure data is collected in different expenditure categories. Expenditure categories group similar types of expenditure together so they can be allocated consistently to different vehicle types.
GCM	Gross combination mass. The gross vehicle mass (GVM) and GCM datasets are used to assess the distribution of GVM/GCM by vehicle type compared with average values used in the PAYGO model.
GTK	Gross tonne kilometres
GVM	Gross vehicle mass. Heavy vehicles charges apply to all vehicles with a GVM of above 4.5 tonnes.
Heavy vehicle charges	The charges paid by heavy vehicle operators. These consist of a yearly registration charge and a road user charge (RUC) on each litre of diesel fuel.
Heavy Vehicle Road Reform	Australian governments are working together to deliver Heavy Vehicle Road Reform. This is expected to replace PAYGO and aims to link 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.
MaxMan	Matrix Manipulation. Software used to calculate reductions in cost allocation to road trains to reflect their limited operating area.
NEVDIS	National Exchange of Vehicle and Driver Information System. NEVDIS is owned by Austroads. It exchanges information about vehicles and driver licenses across state borders.
PAYGO	Pay as you go. The funding model used to calculate the heavy vehicle cost base and to set heavy vehicle charges.
PPP	Public–private partnership. A joint funding partnership between government and the private sector, often in relation to construction.
Regulatory costs	The cost of operating the National Heavy Vehicle Regulator, as reflected in the budget approved by ITMM.
RUC	Road user charge. The RUC is paid by heavy vehicle operators on each litre of diesel used for travelling on public roads.
SMVU	Survey of Motor Vehicle Use. The SMVU is conducted by the Australian Bureau of Statistics. It is the primary source of data for PAYGO.
Unsealed road	A road that has been formed and constructed but is not sealed with a bitumen surface.
Usage data	The data on usage of the roads by heavy vehicles that informs the PAYGO model. This data is collected through the SMVU.
VKT	Vehicle kilometres travelled. A unit of measure that describes the distance travelled by heavy vehicles.
WIM	Weigh-in-motion. A WIM station weighs vehicles while they are in motion.

Appendix A Enlarged figures

Figure 4. Heavy vehicle cost base and estimated revenue (\$m)



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Figure 5. Estimated heavy vehicle cost bases under different cost allocators

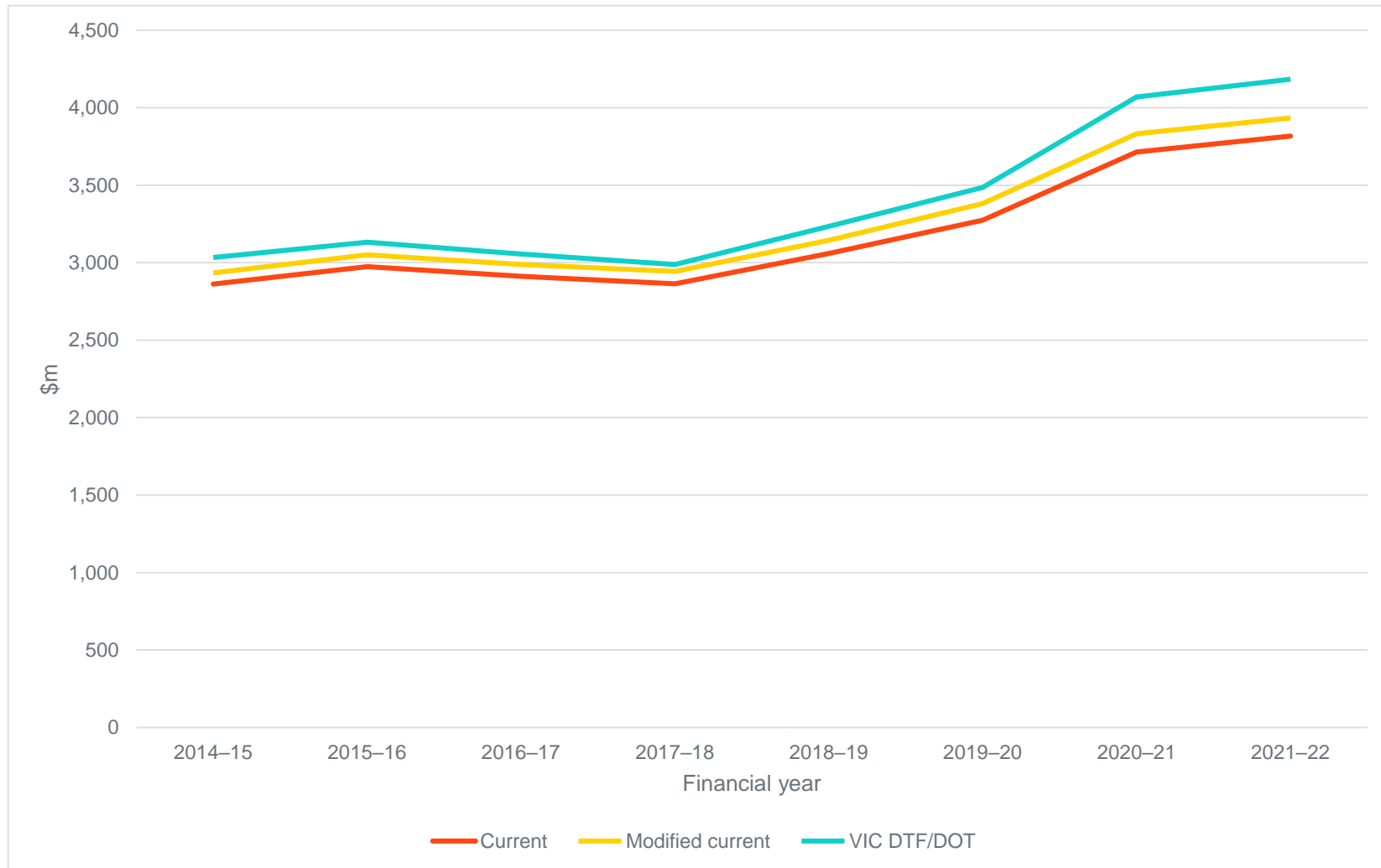
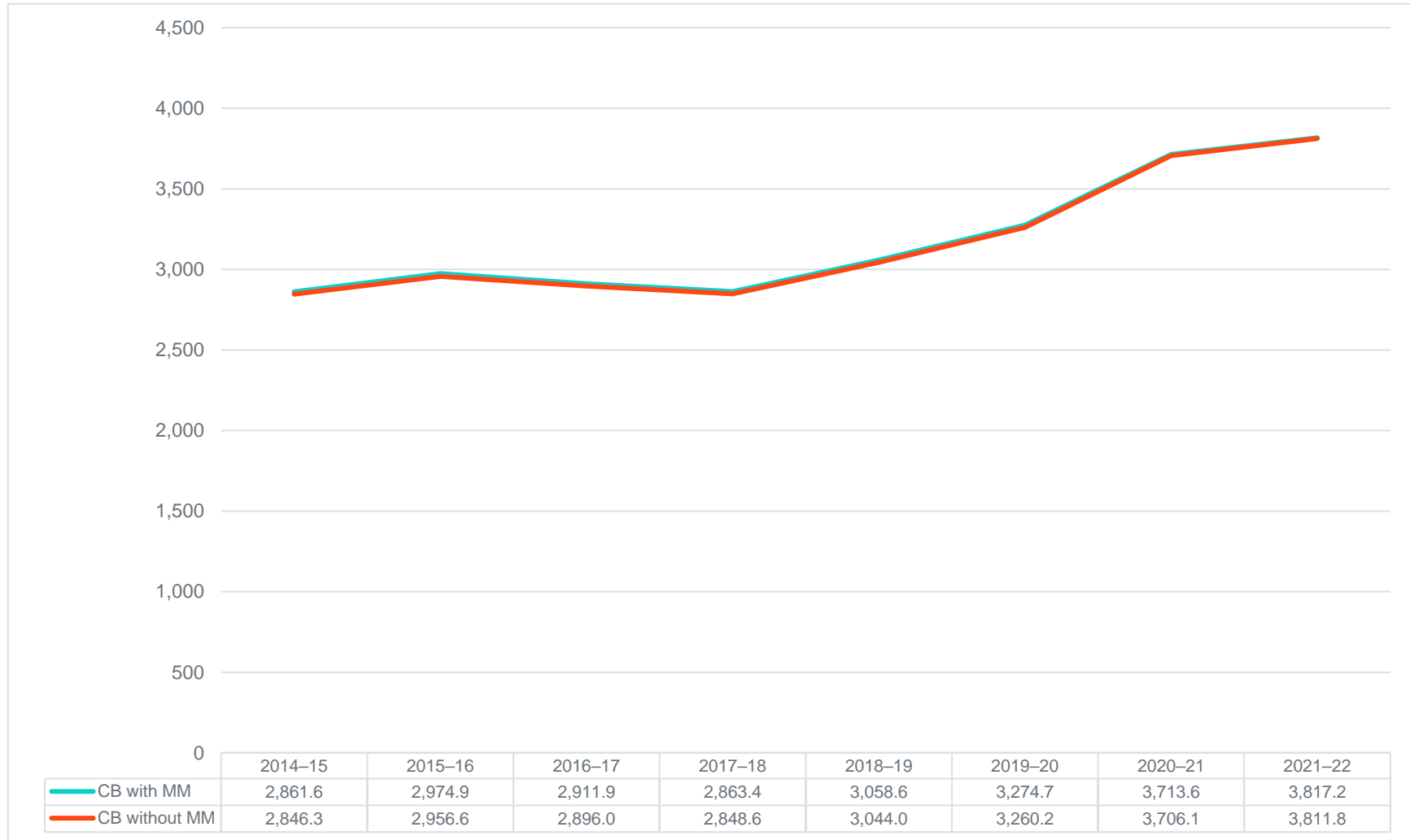
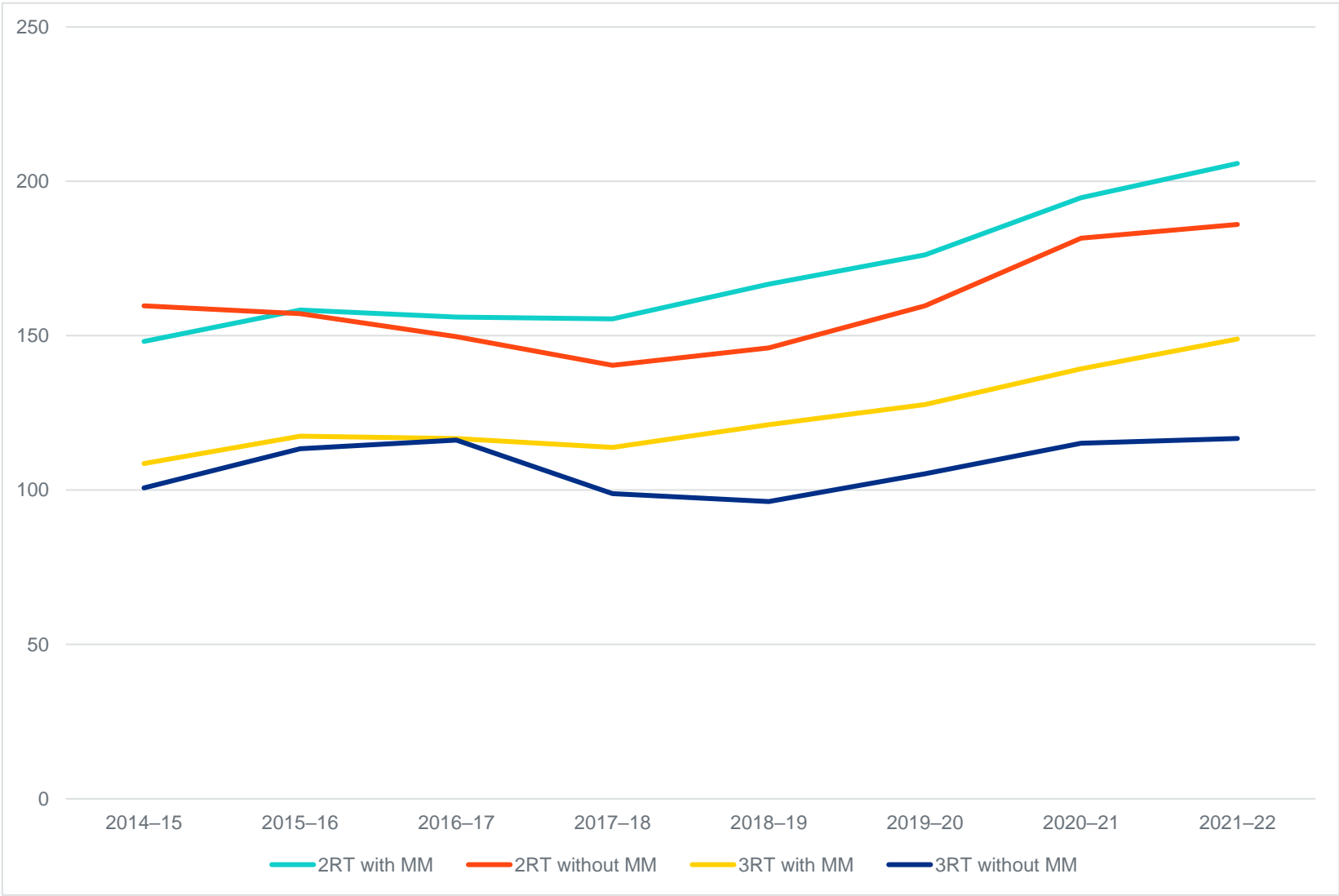


Figure 6. Heavy vehicle cost base with and without MaxMan (\$m)



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Figure 7. Allocated costs, with and without MaxMan for double and triple road trains (\$m)



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Figure 8. Impact on heavy vehicle cost base from changes considered in this RIS (\$m)

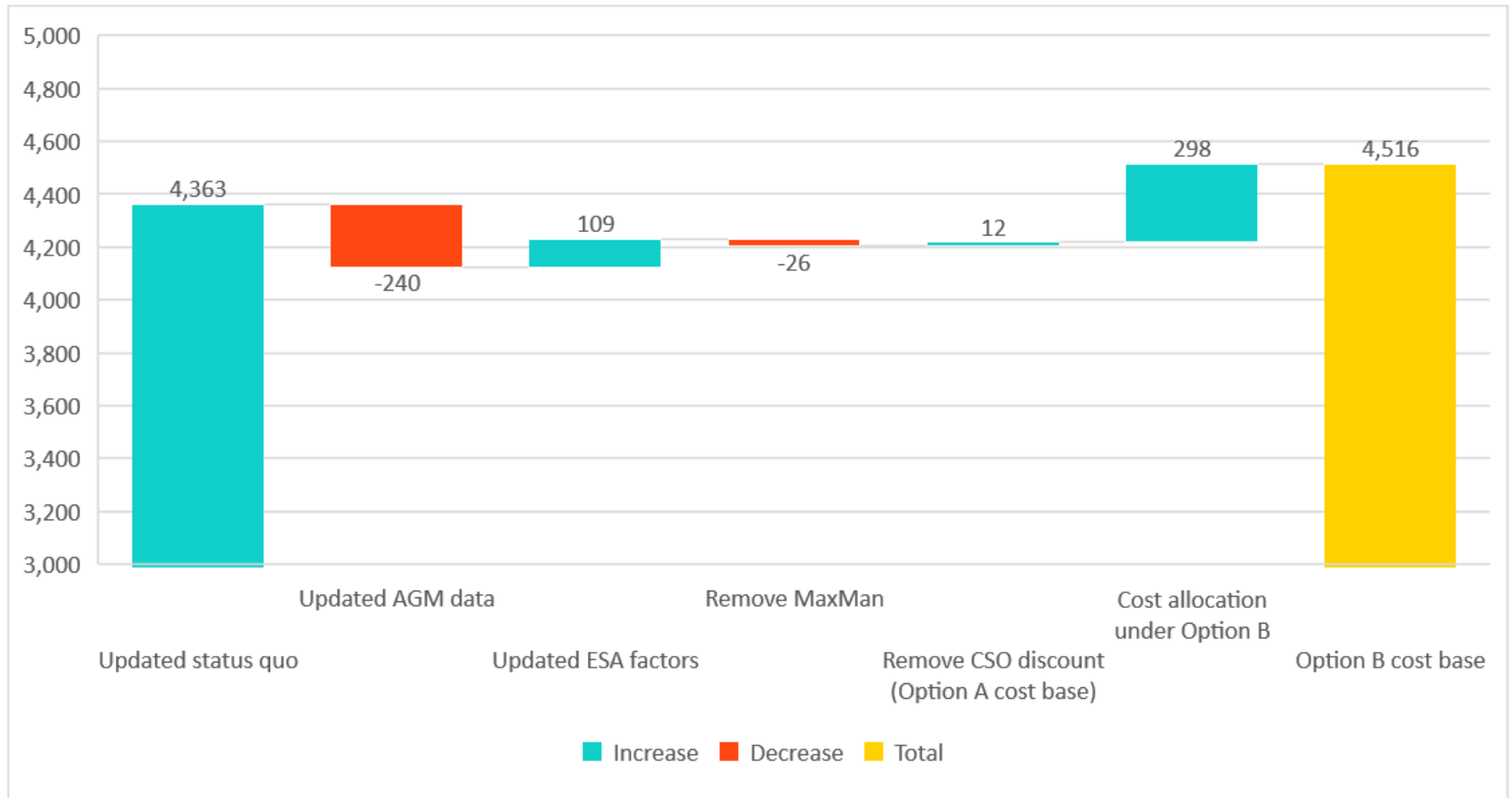
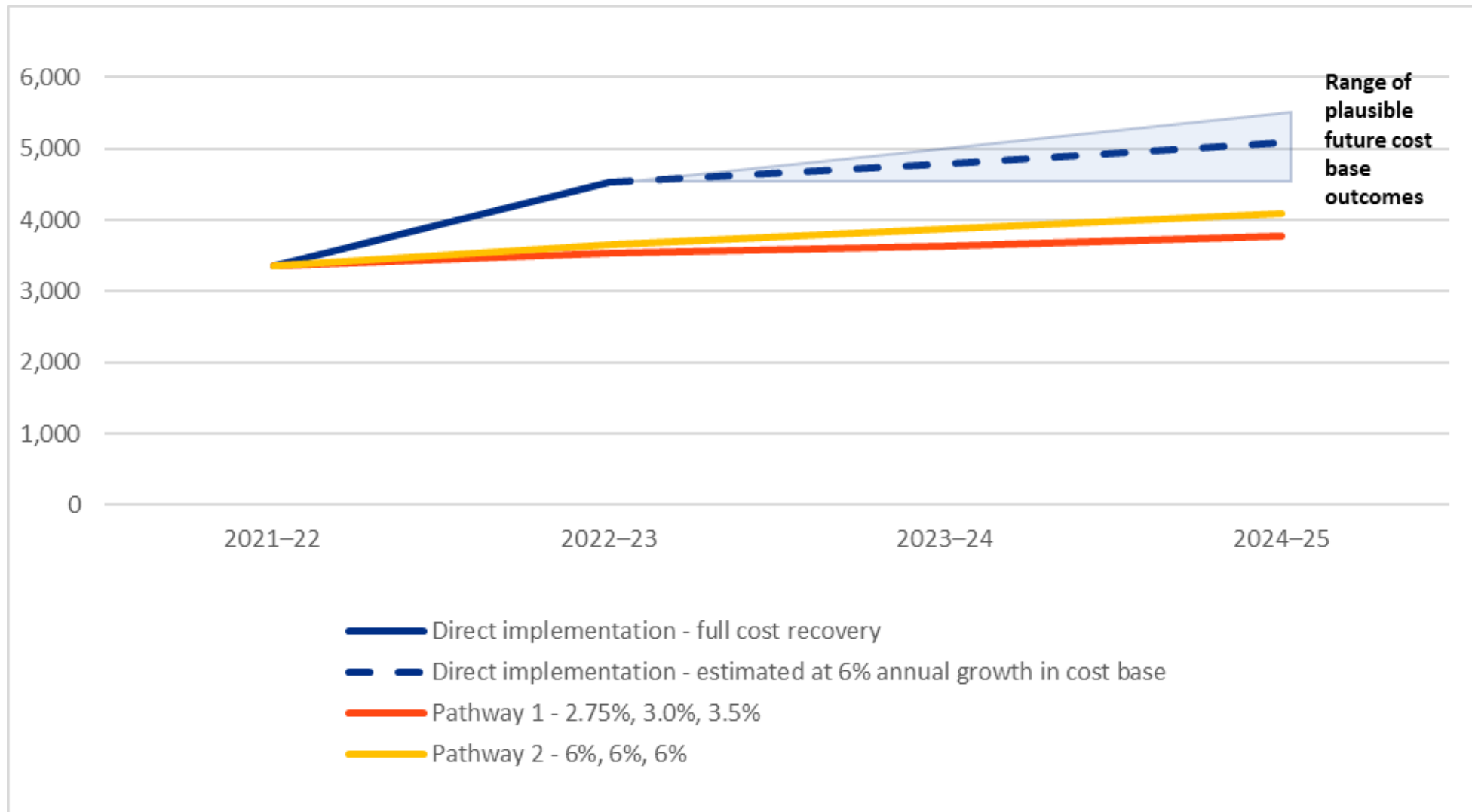
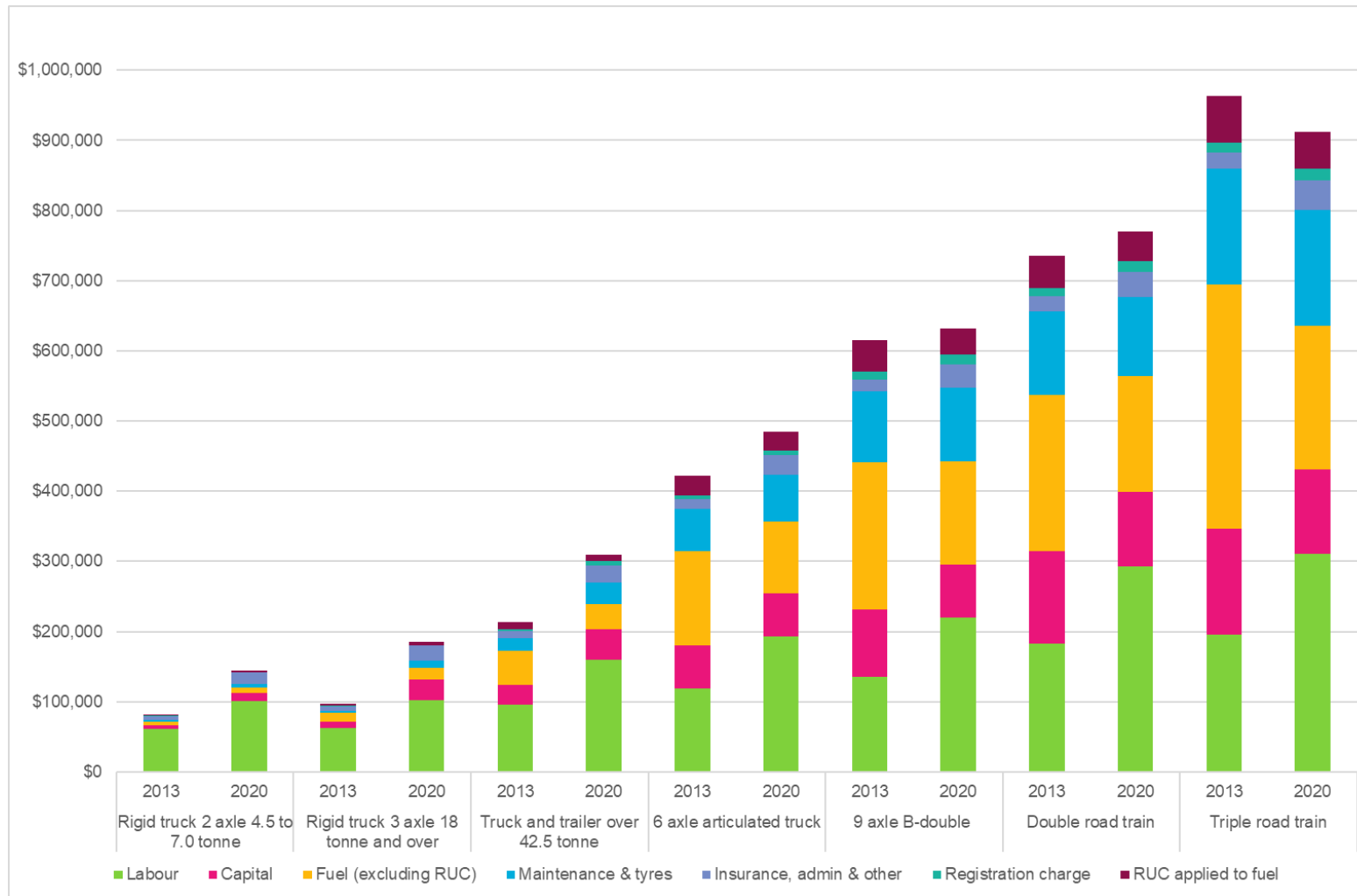


Figure 9. Projected financial implications for heavy vehicle charge revenue (\$m)



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Figure 10. Changes in operating costs from 2013 to 2020



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Appendix B Charging schedules

The following pages of this appendix contain the charging schedules for the roads component of registration charges under the different implementation options, as well as the charging schedule for the regulatory component of registration charges.

Table 32. Charging schedule for the roads component of registration charges under direction implementation of option B, 2022–23

1 July 2022 – 30 June 2023				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	485	1,455	1,455	1,455
Truck (type 2)	1,455	1,652	1,652	1,652
Short combination truck	1,455	1,652	1,999	1,999
Medium combination truck	10,502	10,502	11,342	11,342
Long combination truck	14,518	14,518	14,518	14,518
Prime movers				
Short combination prime mover	849	4,844	5,208	5,208
Multi-combination prime mover	12,288	12,288	13,517	13,517
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	722	722	722	722
Dog trailer	722	722	722	722
Semitrailer	722	917	652	489
B-double lead trailer and B-triple lead and middle trailers	722	917	652	489
Converter dolly or low loader dolly	0	0	0	0
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	364			
Bus (type 2)	2,146	7,432	7,432	
Articulated bus		2,146	2,146	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	354			
Special purpose vehicle (type O)	Calculated using the formula: 442 + (442 × number of axles over 2)			

Table 33. Charging schedule for the roads component of registration charges under pathway 1 of the three-year fixed price implementation pathway, 2022–23

1 July 2022 – 30 June 2023				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	433	769	769	769
Truck (type 2)	769	873	873	873
Short combination truck	769	873	1,782	1,782
Medium combination truck	9,364	9,364	10,114	10,114
Long combination truck	12,945	12,945	12,945	12,945
Prime movers				
Short combination prime mover	757	4,319	4,643	4,643
Multi-combination prime mover	10,957	10,957	12,053	12,053
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	643	643	643	643
Dog trailer	643	643	643	643
Semitrailer	643	818	581	436
B-double lead trailer and B-triple lead and middle trailers	643	818	581	436
Converter dolly or low loader dolly	0	0	0	0
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	325			
Bus (type 2)	330	2,415	2,415	
Articulated bus		330	330	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	315			
Special purpose vehicle (type O)	Calculated using the formula: 394 + (394 × number of axles over 2)			

Table 34. Charging schedule for the roads component of registration charges under pathway 1 of the three-year fixed price implementation pathway, 2023–24

1 July 2023 – 30 June 2024				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	445	804	804	804
Truck (type 2)	804	912	912	912
Short combination truck	804	912	1,833	1,833
Medium combination truck	9,629	9,629	10,400	10,400
Long combination truck	13,311	13,311	13,311	13,311
Prime movers				
Short combination prime mover	778	4,441	4,774	4,774
Multi-combination prime mover	11,267	11,267	12,393	12,393
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	662	662	662	662
Dog trailer	662	662	662	662
Semitrailer	662	841	598	449
B-double lead trailer and B-triple lead and middle trailers	662	841	598	449
Converter dolly or low loader dolly	0	0	0	0
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	334			
Bus (type 2)	345	2,524	2,524	
Articulated bus		345	345	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	324			
Special purpose vehicle (type O)	Calculated using the formula: 405 + (405 × number of axles over 2)			

Table 35. Charging schedule for the roads component of registration charges under pathway 1 of the three-year fixed price implementation pathway, 2024–25

1 July 2024 – 30 June 2025				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	460	844	844	844
Truck (type 2)	844	958	958	958
Short combination truck	844	958	1,893	1,893
Medium combination truck	9,949	9,949	10,745	10,745
Long combination truck	13,754	13,754	13,754	13,754
Prime movers				
Short combination prime mover	804	4,589	4,933	4,933
Multi-combination prime mover	11,641	11,641	12,805	12,805
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	684	684	684	684
Dog trailer	684	684	684	684
Semitrailer	684	869	618	464
B-double lead trailer and B-triple lead and middle trailers	684	869	618	464
Converter dolly or low loader dolly	0	0	0	0
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	345			
Bus (type 2)	362	2,650	2,650	
Articulated bus		362	362	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	335			
Special purpose vehicle (type O)	Calculated using the formula: 419 + (419 × number of axles over 2)			

Table 36. Charging schedule for the roads component of registration charges under pathway 2 of the three-year fixed price implementation pathway, 2022–23

1 July 2022 – 30 June 2023				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	447	793	793	793
Truck (type 2)	793	900	900	900
Short combination truck	793	900	1,839	1,839
Medium combination truck	9,661	9,661	10,434	10,434
Long combination truck	13,355	13,355	13,355	13,355
Prime movers				
Short combination prime mover	781	4,456	4,790	4,790
Multi-combination prime mover	11,304	11,304	12,435	12,435
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	664	664	664	664
Dog trailer	664	664	664	664
Semitrailer	664	844	600	450
B-double lead trailer and B-triple lead and middle trailers	664	844	600	450
Converter dolly or low loader dolly	0	0	0	0
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	335			
Bus (type 2)	340	2,490	2,490	
Articulated bus		340	340	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	325			
Special purpose vehicle (type O)	Calculated using the formula: 407 + (407 × number of axles over 2)			

Table 37. Charging schedule for the roads component of registration charges under pathway 2 of the three-year fixed price implementation pathway, 2023–24

1 July 2023 – 30 June 2024				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	473	853	853	853
Truck (type 2)	853	968	968	968
Short combination truck	853	968	1,946	1,946
Medium combination truck	10,224	10,224	11,042	11,042
Long combination truck	14,134	14,134	14,134	14,134
Prime movers				
Short combination prime mover	827	4,716	5,069	5,069
Multi-combination prime mover	11,963	11,963	13,159	13,159
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	703	703	703	703
Dog trailer	703	703	703	703
Semitrailer	703	893	635	476
B-double lead trailer and B-triple lead and middle trailers	703	893	635	476
Converter dolly or low loader dolly	0	0	0	0
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	355			
Bus (type 2)	366	2,677	2,677	
Articulated bus		366	366	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	344			
Special purpose vehicle (type O)	Calculated using the formula: 430 + (430 × number of axles over 2)			

Table 38. Charging schedule for the roads component of registration charges under pathway 2 of the three-year fixed price implementation pathway, 2024–25

1 July 2024 – 30 June 2025				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	501	917	917	917
Truck (type 2)	917	1,040	1,040	1,040
Short combination truck	917	1,040	2,059	2,059
Medium combination truck	10,819	10,819	11,685	11,685
Long combination truck	14,957	14,957	14,957	14,957
Prime movers				
Short combination prime mover	875	4,990	5,365	5,365
Multi-combination prime mover	12,660	12,660	13,926	13,926
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	743	743	743	743
Dog trailer	743	743	743	743
Semitrailer	743	945	672	504
B-double lead trailer and B-triple lead and middle trailers	743	945	672	504
Converter dolly or low loader dolly	0	0	0	0
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	375			
Bus (type 2)	393	2,878	2,878	
Articulated bus		393	393	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	364			
Special purpose vehicle (type O)	Calculated using the formula: 456 + (456 × number of axles over 2)			

Table 39. Charging schedule for the regulatory component of registration charges

1 July 2022 – 30 June 2023				
DIVISION 1 – LOAD CARRYING VEHICLES (\$)				
Vehicle type	2-axle	3-axle	4-axle	5-axle
Trucks				
Truck (type 1)	202	236	268	268
Truck (type 2)	262	335	381	381
Short combination truck	278	349	403	403
Medium combination truck	652	652	705	705
Long combination truck	902	902	902	902
Prime movers				
Short combination prime mover	385	385	385	385
Multi-combination prime mover	870	870	956	956
DIVISION 2 – LOAD CARRYING TRAILERS (\$)				
Axle group type (per axle charge (\$))	Single	Tandem axle group	Tri-axle group	Quad-axle group & above
Trailer type				
Pig trailer	55	28	18	14
Dog trailer	55	28	18	14
Semitrailer	55	28	18	14
B-double lead trailer and B-triple lead and middle trailers	55	28	18	14
Converter dolly or low loader dolly	55	28	18	14
DIVISION 3 – BUSES (\$)				
Bus type	2-axle	3-axle	4-axle	
Bus (type 1)	197			
Bus (type 2)	358	409	409	
Articulated bus		440	440	
DIVISION 4 – SPECIAL PURPOSE VEHICLES (\$)				
Special purpose vehicle (type P)	0			
Special purpose vehicle (type T)	199			
Special purpose vehicle (type O)	199			

Appendix C Proposed treatments for innovative funding and financing

Table 40 outlines the NTC's proposed treatments of certain types of innovative funding and financing, and the rationale for the chosen methods, based on the principles discussed in section 4.4.4. The types of innovative funding and financing included in the table are not intended to be an exhaustive list but have been included in the decision regulation impact statement to provide an indication of how common types of innovative funding and financing may be treated.

However, it is impossible to predict all possible future road funding and financing approaches and their specific circumstances, so each instance may require assessment on a case-by-case basis. In addition, we recognise that possible future developments – for example, a move to independent pricing or economic regulation, or funding reform – may necessitate a reconsideration of the principles and proposed treatments.

Table 40. Proposed treatments of selected innovative funding and financing

Theme	Proposed treatment	Rationale
Revenue		
Revenue received by governments from toll road users or beneficiaries	Any identifiable revenue received by governments from users/beneficiaries of a project – that is, toll revenue or revenue raised through value capture (e.g. betterment levies) – should be offset against the model's cost base.	<p>Heavy vehicle pricing is based on the principle of cost recovery (as outlined in the list of principles) so that charges are set that aim to minimise both under- and over-recovery.</p> <p>Failure to offset revenues received from other sources against the model's cost base would mean the costs were recovered twice (i.e. over-recovery) – once through direct revenue from users/beneficiaries and once through the broader road charging system.</p> <p>The implication of this treatment is that all such revenues are being raised for cost recovery purposes, without any of the revenue being attributed to addressing externalities.</p>
Revenue received by governments more than any government contributions	Relating to the proposed treatment above, identifiable toll or value capture revenue received by governments for a project should continue to offset the cost base even if it exceeds the amount contributed by the government towards the project (in nominal terms or present value terms).	Any excess toll or value capture revenue (beyond the government's contribution to the relevant public-private partnership [PPP] or toll road) received by the government should continue to be deducted from the cost base since road users are contributing to the government's road funding generally, albeit through a different mechanism than road user and registration charges. (This treatment is consistent with the first and third proposed principles.) While this means some cross-subsidisation may occur from users of tolled roads (where governments receive some/all toll revenue generated) to users of other roads, this is no different from what occurs presently with de facto cross-subsidisation between roads under the current charging system. This proposed treatment would need to be revisited if road charging reform occurs, with location-based charging and revenue being allocated to achieve cost recovery at a more disaggregated level (e.g. by road or road category).
Roads where revenue from tolls or value capture fully funds the road	PPP projects where user charges (i.e. toll revenue or value capture) fully fund the road should not have any expenditure added to the cost base on transfer of the asset to the government at the end of the concession.	Users/beneficiaries have already fully funded the road. If added to the cost base, these costs would be recovered for a second time from road users through road charges. This treatment is consistent with the first proposed principle (cost recovery).
Funds raised through asset recycling	Funds raised by governments through asset recycling programs should, in general, not be deducted from the cost base unless the funds come from the privatisation of road assets, with the intention for these funds to be reinvested into roads.	<p>Revenues from asset recycling of non-road assets are a general source of government revenue, and the funds may go into consolidated revenue. In principle, there is no reason for funds raised from privatisation of assets to necessarily go into funding roads, as opposed to other forms of infrastructure. Also, unlike the case of value capture, the revenues are not being raised from direct beneficiaries of the project.</p> <p>However, if both the funding source (privatisation) and intended destination of the funds are roads, the funds raised from asset recycling should be deducted from the cost base.</p>

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Theme	Proposed treatment	Rationale
Expenditure		
Government loans to private sector participant(s) [1]	Government loans to a private sector participant in a PPP that are intended to be repaid (with interest) should not be recovered through the cost base if the arrangement is broadly commercial.	If the government makes a loan, rather than providing a grant/subsidy, the government will receive interest payments from the private sector participant. If the interest rate received by the government is as high as the government's interest rate for borrowing (which is expected to occur in general), along with a return of the principal, the government would be no worse off by making the loan arrangements. ²⁶ Therefore, the loan's costs should not be charged to road users. This treatment is consistent with the first and second proposed principles.
Government loans to private sector participant(s) [2]	Government loans to a private sector participant in a PPP where loan arrangements are not broadly commercial or there is a default by the private sector should be considered as government costs or revenues (as relevant).	In the event of default by the private sector participant, or governments lending to the private sector at an interest rate below the government's cost of borrowing, the NTC considers these net costs should be recovered from road users. ²⁷ Similarly, if the government were to lend to the private sector participant(s) at an interest rate significantly above its cost of borrowing and any administration costs (i.e. if it made a profit from its lending) then this net profit should be deducted from the cost base that is recovered from road users. Treating any under- or over-recovery achieved through lending to the private sector for a PPP will require the magnitude of the loss/profit to the government to be identifiable and for data to be provided. This treatment is consistent with the first and second proposed principles.
Payments by government, recognising a road infrastructure asset's value	If the government has specifically made a payment to the private sector participant at the start or end of the concession that recognises the value of a road asset (e.g. a subsidy or a payment in lieu of the asset value unrecovered through other revenue sources) on transfer, this payment should be recovered from road users.	The government's payments imply that user charges have not fully paid for the costs of the road during the period of the concession. The government's payment is in effect making up the shortfall in revenue (albeit potentially from an ex-ante perspective at the time when the contract was signed). Payments made by the government to cover this shortfall should be recovered from road users. This treatment is consistent with the first and second proposed principles.

²⁶ In practice, there may be an opportunity cost if the borrowed money could have been put to a use with a higher benefit–cost ratio than making the loan to the private sector participant. However, the government would be no worse off in financial terms so long as the principal is repaid, along with an interest rate at least as high as the government's cost of borrowing.

²⁷ From a modelling perspective, this could be treated by calculating the net present value of the concession and entering that into the model as expenditure once, or potentially calculating the difference annually between government borrowing costs and interest payments received.

Theme	Proposed treatment	Rationale
Gifted assets	Gifted assets that are built by other parties at no cost to the government (e.g. roads built by developers and subsequently transferred to the government) should not be added to the cost base. However, any future costs incurred by a government on maintenance or renewal are relevant and should be recovered from road users through expenditure in the model.	These costs have already been paid for from other sources (e.g. through costs of a new estate). Subsequent operating/maintenance/renewal/upgrade/expansion costs borne by government should be recovered from road users because these are government costs that are not funded from elsewhere. This treatment is consistent with the first proposed principle (cost recovery).
Recurring government payments to the private sector participant(s)	Recurring payments made by the government to the private sector entity (e.g. availability payments, shadow tolls, payments for minimum demand guarantees) should be recovered through the model each year as they are incurred.	Recurring costs such as availability payments represent a genuine cost to government from undertaking the PPP under the agreed structure, as opposed to constructing/maintaining the road under a more 'traditional' project structure. If the government receives toll or value capture revenue in return, this revenue should be deducted from the model's cost base (in accordance with the principles and proposed treatments above). This treatment is consistent with the first and second proposed principles.
Early termination of a public-private partnership	In the event of early termination of a PPP (including contract buy-outs), costs incurred by government (less any revenues received) should be included in the model and recovered through road charges.	Early termination of a PPP may occur for several reasons, including (but not limited to) default by the private sector participant(s), force majeure or a discretionary choice made by a government. These are legitimate costs incurred by government and should be recovered through road charges, less any revenue received by the relevant government (e.g. payments from the private sector participant(s) or insurance payouts). This treatment is consistent with the first and second proposed principles.

Appendix D How the PAYGO model works

Overview

The National Transport Commission's responsibilities

The National Transport Commission (NTC) has ongoing responsibilities for recommending heavy vehicle charges to the Infrastructure and Transport Ministers' Meeting (ITMM). These charges are intended to apply nationally and are set to fully recover the share of road construction and maintenance costs that can be allocated to heavy vehicles.

Charges that apply to heavy vehicles

All heavy vehicles in Australia are charged an annual registration fee and a road user charge (RUC) levied on each litre of diesel fuel. These charges are determined according to a charging framework known as the pay-as-you-go (PAYGO) methodology. The primary objective of PAYGO is to deliver a nationally consistent set of heavy vehicle charges that efficiently recover the cost of providing and maintaining the road network.

Heavy vehicle charges recover the capital and operational costs of building and maintaining the Australian road network allocated to heavy vehicles. These charges consist of:

- the RUC levied on fuel used by heavy vehicles, administered and collected by the Commonwealth Government
- registration charges for heavy vehicles administered and collected by state and territory governments.

Legislative framework

In relation to the RUC, the *Fuel Tax Act 2006* requires that the Commonwealth Minister for Transport determines the amount of RUC paid by heavy vehicle operators. The Fuel Tax Act obliges the minister to consult before increasing the RUC. This must be in the form of public consultation for at least 60 days on a document that contains the proposed increased rate of RUC and any information that was relied on in determining the proposed increased rate.

The Fuel Tax Act then requires the minister to consider any comments received (within the period specified by the transport minister) from the public in relation to the proposed increased rate.

In relation to the registration charge, the *National Transport Commission Act 2003* and the *Intergovernmental Agreement on Regulatory and Operational Reform in Road, Rail and Intermodal Transport* provide the authority for the NTC to recommend registration charges for heavy vehicles to ITMM.

ITMM periodically determines the process to calculate charges that are to be applied to heavy vehicles. The process, known as a determination, combines the requirements of developing the RUC and the registration charges into a single consistent process that also calculates the amount that charges must be adjusted each year to maintain cost recovery, known as PAYGO.

Section 52 of the National Transport Commission Act provides that the Governor-General may make regulations, not inconsistent with the Act, prescribing all matters required or

permitted by the Act to be prescribed or necessary or convenient to be prescribed for carrying out or giving effect to the Act.

The Heavy Vehicle Charges Model Law contains the schedules of heavy vehicle registration charges agreed by ITMM. The model law also describes the methodology for calculating an annual adjustment for charges in subsequent years. The charges have legislative force once the model law is adopted by states and territories.

Original PAYGO objectives

PAYGO was originally set up to provide a nationally consistent approach to heavy vehicle charges. Before PAYGO, individual state and territory governments would set their own charges. The basis for these charges varied significantly. In some states, charges varied with the gross mass of vehicles, while in others they were based on tare mass or on a combination of vehicle characteristics (including engine bore diameter).

Despite all operators having access to all roads in Australia, an operator's competitive position often depended on their garaging address rather than on the underlying efficiency of the business.

The first national heavy vehicle charges aimed to apply, for the first time, uniform charges to the same vehicle type regardless of the jurisdiction in which it was registered.

The brief given to the then National Road Transport Commission under the Heavy Vehicle Agreement defined five charging principles that required the commission to set charges:

- to fully recover distributed road costs while minimising over-recovery from any vehicle class, thereby achieving full recovery of all road costs
- adopting a common methodology
- to determine and collect charges in a way that achieves a reasonable balance between administrative simplicity, efficiency and equity in the charging structure
- to improve pricing, leading to a better allocation of resources, with investment decisions on equipment and infrastructure being based on more relevant demand signals
- to minimise the incentive for operators to 'shop around' for lower charges and undermine the integrity of the national charging system.

The pricing principles

Predecessors of ITMM have set pricing principles for the NTC in making its recommendations to ministers. These pricing principles are discussed in section 2.1.1.

How PAYGO works

Each year, jurisdictions provide the NTC with a completed road expenditure template that covers all road construction and maintenance costs (light and heavy vehicles). A cost base is then established with the heavy vehicle portion recovered via heavy vehicle charges. Figure 11 provides an overview of the existing PAYGO system.

Figure 11. Overview of the current PAYGO system

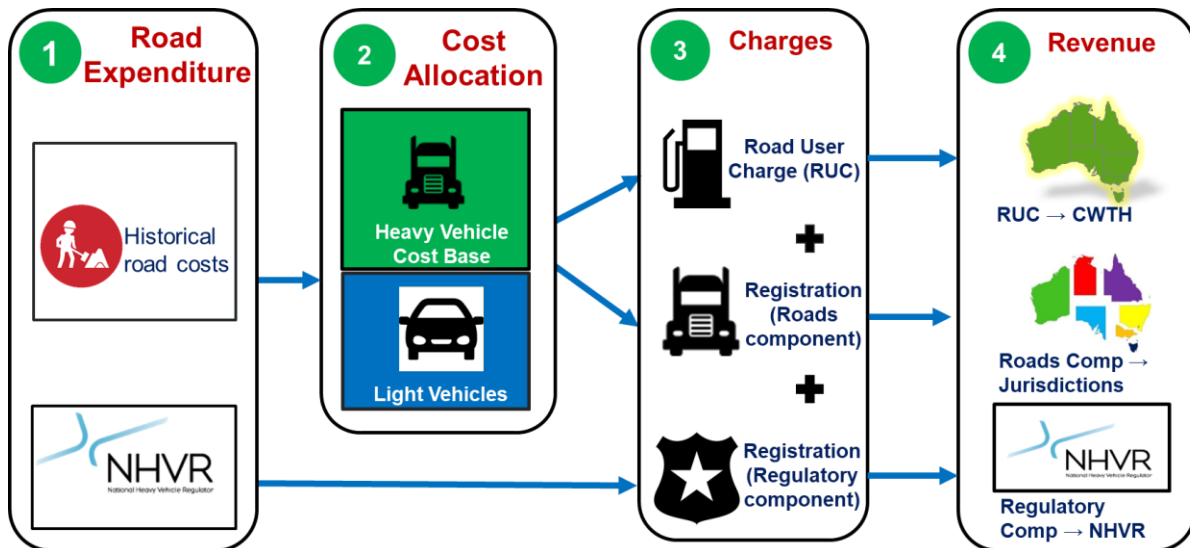
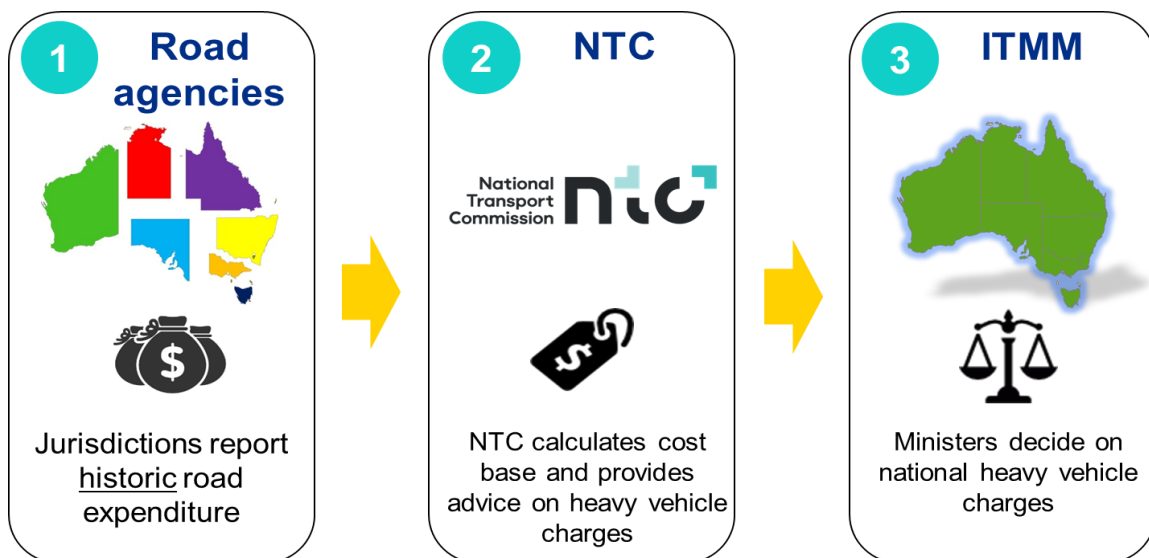


Figure 12 illustrates how the NTC processes this information and makes recommendations to ITMM. The NTC’s charge recommendations are non-binding.

Figure 12. Overview of existing PAYGO regulatory process



Calculating the cost base

Under PAYGO, both capital and operating expenditure are recovered in the year they are incurred (subject to averaging).

The cost base is calculated by taking a seven-year average of the historical financial costs of providing roads.²⁸ The system was designed to recover the financial cost of roads on the assumption that the financial cost was a reasonable approximation of the economic cost.

²⁸ An exponential moving average is currently used to apply greater weights to the most recent years.

The key difference between financial and economic costs is that under a financial cost recovery approach, capital costs are recovered in the period in which the expenditure takes place. Under economic cost recovery, capital costs are depreciated and recovered over the life of the asset.

The assumption that the financial cost is equal to the economic cost was based on the following criteria being met:

- the network is neither expanding nor contracting, nor is the pavement or bridge condition changing significantly
- network-wide expenditure does not fluctuate markedly over time
- traffic growth is relatively steady.

Over the past decade, these conditions have tended not to hold, and the cost base and charges have been quite volatile.

The PAYGO model's cross-subsidy check and its limitations

The PAYGO model has a built-in module to check there are no cross-subsidies, in order to comply with the pricing principles. It involves checking whether the 'average vehicle' in a vehicle class pays enough in charges (both registration and RUC²⁹) such that they contribute an amount greater than or equal to the average attributable costs for each vehicle in that vehicle class. Attributable costs are those that can be directly associated with heavy vehicles based on the four cost allocators in the cost allocation matrix.³⁰

In addition to each vehicle class recovering at least its attributable costs, the pricing principles also require that heavy vehicles in aggregate recover their share of common (or non-attributable) costs, such that overall the charges paid by the entire heavy vehicle fleet recover the heavy vehicle cost base (and therefore heavy vehicles are not being subsidised by other sources, such as light vehicles or governments).

The current charge-setting framework relies on two components for recovering road-related costs: registration charges and the RUC.³¹ This gives limited ability to adjust the charges paid by a particular vehicle class given that:

- all heavy vehicles pay the same rate of RUC (in cents per litre)
- particularly among the articulated fleet, modularity means that a particular vehicle component may appear in a range of different vehicle classes.³²

Due to these points, some vehicle combinations may pay total charges only slightly above their attributable costs, meaning that although they are not being cross-subsidised, they are making a relatively small contribution towards common costs. By contrast, other heavy vehicle classes will pay charges significantly higher than their attributable costs, meaning

²⁹ Based on the average distance and fuel consumption in that vehicle class.

³⁰ VKT, PCU-km, AGM-km and ESA-km.

³¹ The regulatory component of registration charges is ignored for the purposes of this cross-subsidy check because this is a separate process designed to recover the National Heavy Vehicle Regulator's budget from vehicles registered in participating jurisdictions.

³² For example, a 3-axle semitrailer could potentially fit in several of the PAYGO model's single-combination vehicle classes (5-, 6- and 7-axle rigs) as well as B-doubles, B-triples, double road trains and triple road trains.

they are making a greater contribution towards recovering the heavy vehicle industry's share of common costs.

In summary, different vehicle classes will make relatively high or low contributions towards recovering the share of overall common costs assigned to heavy vehicles under the PAYGO model's cross-subsidy check. However, this is largely unavoidable (given the modularity of the fleet and the limited ability to adjust charges for individual vehicle classes as a result) and is not a problem in regard to the pricing principles (as cross-subsidies between heavy vehicle classes have been avoided and overall cost recovery is achieved from heavy vehicles). In the future, under alternative charge setting mechanisms being considered under Heavy Vehicle Road Reform, it may be possible to consider alternative charge-setting approaches that achieve a more equitable sharing of common costs across different heavy vehicle classes if this is considered desirable.

Appendix E Summary of submissions on the C-RIS

The table below outlines submissions in response to the C-RIS (grouped by question/theme) and the NTC's responses.

Table 41. Summary of submissions and the NTC's responses

Stakeholder	Question no.	Theme	Extract	NTC response
ATA	1	Expenditure template and accountability	<p>The ATA agrees with the NTC's recommendation to continue using the PAYGO expenditure categories.</p> <p>The NTC expenditure template should be amended to require each organisation's CEO or equivalent to certify that the major projects included in categories F1, F2 and F3:</p> <ul style="list-style-type: none"> ▪ have been endorsed by an independent infrastructure agency such as Infrastructure Australia ▪ are based on integrated transport planning, including trucking industry and community consultation ▪ include rest areas and access improvements in project planning and delivery. <p>The ATA's concerns about the PAYGO expenditure inputs go beyond auditing or reviewing the data. PAYGO is entirely driven by governments' spending decisions, and requires heavy vehicle operators to pay:</p> <ul style="list-style-type: none"> ▪ an outsize share of the cost of road investments that are not freight priorities ▪ higher costs due to inadequate project assessment and selection. 	<p>Noted. Regarding the proposal for additional measures to road agencies' sign-off, the NTC proposes that some measures to confirm projects had been subject to external review, where required by existing rules, could be explored for future expenditure submissions. The most likely outcome of such measures would be to provide reassurance to stakeholders rather than changing the amount of expenditure reported.</p> <p>The road network needs to be built to accommodate the needs of both light and heavy vehicles. Given the highly aggregated nature of the PAYGO model, and the national application of heavy vehicle charges, it is inevitable that some cross-subsidies between vehicle classes occurs on a project basis. However, compared internationally, the percentage of total expenditure allocated to heavy vehicles is conservative.</p>
Bus Industry Confederation	1	Expenditure template and accountability	<p>Agree. This determination is a transitional one and the Heavy Vehicle Road Reform process should be the place for deciding future charging methodologies and how they operate.</p>	Noted.
NatRoad	1	Expenditure template and accountability	<p>NatRoad supports the development of an FLCB ... However, in the current analysis it does not appear that there would be a translation of the FLCB model potentially used by the NTC to the model used in the HVRR process.</p>	Noted.

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			The complexities and costs involved in applying the NTC prototype FLCB model, having regard to the fact that it may not be used as part of HVRR, weigh against moving away from the current PAYGO model. In essence, it's a question of 'the devil you know'. In addition if the FLCB devised by the NTC cannot be guaranteed to be utilised in the HVRR process then devoting resources to its implementation is not warranted.	
NHVR	1	Expenditure template and accountability	The current expenditure categories provide a known qualification of data that enables the NTC to recommend a determination using the current PAYGO model. While we suggest that introducing further categories nominated under a Forward Looking Cost Base (FLCB) model could reduce some administrative costs, it remains unclear how many benefits could be realised. Until the NTC can rigorously test and evaluate the FLCB model, the PAYGO model should be used as the basis for calculating and recommending the determination.	Noted.
The Chartered Institute of Logistics and Transport Australia (CILTA)	1	Expenditure template and accountability	Road depreciation often comes up as an idea in road pricing discussions. However, full road rehabilitation is actually the sum of all depreciation since the last rehabilitation. Periodic maintenance should be separated from rehabilitation in pricing,	Expenditure is collected separately but charges are not based on any individual expenditure category, and changes to the charging mechanism fall outside the scope of this charges determination.
ALC	2	PAYGO – treatment of innovative funding and financing methods	Finally, as discussed in Table 6 of the RIS it is appropriate to change the guidelines in relation to toll roads, to require the reporting of government revenue received from tolls so there is full knowledge as to how much heavy vehicles operators have to pay for the use of toll roads.	Noted.
ATA	2	PAYGO – treatment of innovative funding and financing methods	<p>The NTC should not proceed with option 5 in table 6 of the RIS. Toll roads and financing models should not be included in the heavy vehicle cost base.</p> <p>If the NTC does proceed with option 5, the cost of toll relief should be allocated to light vehicles in the PAYGO process and not form part of the heavy vehicle cost base.</p> <p>The ATA holds significant concerns about the NTC's preferred option, option 5, because it would:</p> <ul style="list-style-type: none"> ▪ ignore the existing tolls paid by heavy vehicles, which vastly exceed the marginal cost of their road wear ▪ could result in light vehicle toll relief paid out of government revenue being inappropriately attributed to heavy vehicles. 	Noted. The level of tolls set by private sector operators is out of scope for this determination because these matters are generally determined through contractual arrangements between governments and the toll road owner/operator. The focus of this workstream is to achieve recovery of governments' net costs on roads. As noted in the C-RIS, governments may incur costs on tolled roads, without which the tolls might otherwise have been set at a higher level to achieve recovery of that road's costs. However, the NTC accepts that light vehicle toll relief should not be included in

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				governments' costs for toll roads (noting that such expenditure has not been reported by any jurisdiction in their 2020–21 expenditure return) and the NTC can clarify this in future versions of the expenditure guidelines.
Bus Industry Confederation	2	PAYGO – treatment of innovative funding and financing methods	Agree that this option is most consistent with PAYGO.	Noted.
NatRoad	2	PAYGO – treatment of innovative funding and financing methods	<p>NatRoad does not support Option 5 in Table 6 as the best way to treat innovative funding and financing under PAYGO ...</p> <p>NatRoad's view is that the manner of identifying the 'net cost' to government at any particular time would be difficult and variable. This is acknowledged in the CRIS where the notes in Option 5 indicate 'Some types of innovative funding and financing will be difficult to foresee and/or develop detailed guidance for ahead of time.'</p> <p>Further, the data and its impact on the cost base is not able to be considered as part of the CRIS: 'It is not possible to estimate by how much the proposed approach under option 5 would change the heavy vehicle cost base going forward.' NatRoad cannot therefore support a proposal designed to further allocate costs to the industry in a manner, and to an extent, not able to be properly assessed or calculated and therefore our answer to question 2 is 'No.'</p>	Guidance for particular projects may need to be developed to take into account unique circumstances. The recommended high-level principles provide guidance on the intended approach to be developed for these specific circumstances. None of the technical changes in the C-RIS can be quantified precisely in future years since they will depend on unknown future expenditure and usage. However, the intention of the proposal is to capture any government costs on roads (less any revenue received by governments from them).
NHVR	2	PAYGO – treatment of innovative funding and financing methods	Option 5 in Table 6 presents a strong narrative justifying the benefits of changing the guidelines to properly account for tolled roads and any other types of innovative funding or finance models used by governments that change the timing or nature of expenditure incurred or revenues received by government. Net road related costs incurred by government would be identified in this option and could be included in the PAYGO cost recovery system. This option represents greater accuracy as a treatment approach for known innovative funding and finance; however, we note that none of the options presented can address all types of innovative funding and financing. As new innovative funding and financing approaches are identified, the NHVR recommends that the approaches are reviewed and considered for inclusion.	Noted.
Bus Industry Confederation	3	PAYGO – treatment of innovative funding and	No opinion.	Noted.

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		financing methods		
NatRoad	3	PAYGO – treatment of innovative funding and financing methods	The better view, we contend, would be to exclude from the cost base all road financing costs and all revenue raised via tolls or through the agency of tailored funding mechanisms. This is our response to Question 3.	Noted.
NHVR	3	PAYGO – treatment of innovative funding and financing methods	The NHVR is not in a position to offer any further views on treatment of innovative funding and finance.	Noted.
Bus Industry Confederation	4	PAYGO – treatment of innovative funding and financing methods	Only if no HVs can use the road(s) in question.	Noted.
NatRoad	4	PAYGO – treatment of innovative funding and financing methods	The answer to question 4 is yes: put simply heavy vehicles should not have to pay for the cost of roads that they are prohibited from using and/or where they pay for the use of that road via a toll. In addition, roads that various classes of truck are unable to access should not be paid for either: the whole basis of the system is intended to be one of user pays. It is therefore axiomatic that if use is proscribed then payment should not be required.	Noted. In principle this change could be factored into the expenditure guidelines, but it is not clear how readily road agencies can easily identify such expenditure. Even if this change did occur, there is no way to verify how much effect it would have under current auditing arrangements.
NHVR	4	PAYGO – treatment of innovative funding and financing methods	<p>The NHVR supports in principle the notion to amend the guidelines in cases where roads have been identified that heavy vehicles cannot use. However, it is critical that, before expenditure guidelines are amended to remove a particular road, the said road is in fact a road that excludes heavy vehicle usage.</p> <p>For example, the C-RIS suggests Pennant Hills Road (a 15-kilometre section of the Cumberland Highway) should not be reported for reasons stated in Question 4. However, one article suggests Pennant Hills Road supports a significant number (approximately 5,000) heavy vehicle movements per day. Further, Pennant Hills Road is designated for up to 25/26m B-Double Route (see Figure 1 for details).</p>	Noted. This specific example (Pennant Hills Road) was raised by several industry participants at workshops held prior to the release of the consultation RIS. The NTC acknowledges that certain heavy vehicles are permitted to use Pennant Hills Road, as indicated by the NHVR, including: a truck or bus 12.5 m long or less and 2.8 m clearance height or less; a truck or bus exceeding these dimensions but with a delivery or pick-up destination only accessible by Pennant Hills

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				<p>Road; vehicles transporting a placard load of dangerous goods; and/or an oversize vehicle operating under a Class 1 permit or notice approved to use Pennant Hills Road.</p> <p>While there are some roads that are not accessible for heavy vehicles, expenditure on these roads are unlikely to have a material effect on the heavy vehicle cost base. Many of these roads are likely to be local roads where the current approach of excluding significant proportions of costs already reduce the amount of relevant expenditure included in the cost base.</p>
Bus Industry Confederation	5	PAYGO-- usage data	Usage data will be critical for whatever future road user charging system is put in place, so its collection should be continued. Mass, distance, location-based charging is the future and telematics should assist the data collection process, which should be organised around moving in this future direction.	Noted.
NatRoad	5	PAYGO – usage data	The answer is simple: the NTC and/or the jurisdictions should pay for the continuation of the SMVU. If that does not occur then an inflation-based indexation of the current HV [heavy vehicle] charges, as proposed in paragraph 4 above, makes even more sense. Assuming that data will need to be tailored to operate the charges model that results from the HVRR process, then the sort of source data needed to feed into that model will become more important than transfusing blood into the near-corpse of the PAYGO model via an alternative source to the SMVU. It is anticipated that data of the kind generated by the SMVU will be needed under the HVRR system.	Noted. DITRDC is currently involved in developing approaches for an alternative data source.
NHVR	5	PAYGO – usage data	The NHVR supports the continued use of the PAYGO model to determine heavy vehicle charges until a more effective model can be properly tested. We note that while the Survey of Motor Vehicle Usage (SMVU) data ceased in 2020, likely affecting the PAYGO model's longer term accuracy in calculating costs, a viable alternative model has yet to be tested and endorsed. Until such time, while the PAYGO model is used, the NTC should work with ABS to find an alternative and reliable supplier of usage data.	Noted.
NHVR	5	PAYGO – Usage data	The PAYGO model relies on SMVU usage data to calculate costs. It is essential that usage data remains available to access. The NHVR encourages the NTC to work with the ABS to find an alternative and reliable supplier of usage data. In doing so, the NHVR would strongly recommend that whatever solution to accessing	Noted. The funding approach for any future dataset would need to be determined once it was available.

			related data is agreed upon, that the cost to capture this information is not passed on to industry (and if it is, at a very minimal cost).	
Bus Industry Confederation	6	PAYGO – usage data	Contract the ABS to do the work, to keep them engaged and with a consistent approach.	Noted.
NHVR	6	PAYGO – usage data	<p>The NHVR is aware that Automated Number Plate Recognition (ANPR) cameras are used to record vehicle data in metro and non-metro locations. The NHVR receives heavy vehicle sighting data for key freight routes, typically in non-metro areas. Using the GPS location of the camera, and the registration plate reading, the NHVR can calculate:</p> <ul style="list-style-type: none"> a. Vehicle classifications using the NTC charge code and PAYGO classification by matching with the registration record for the sighted vehicle b. Distance travelled by a registered vehicle based on multiple sightings of that vehicle through the national camera network e.g. distance from Camera A to Camera B to Camera C and so on. c. Vehicle classes average distance travelled in a 12-month period through the camera network (calculated using the above data). <p>Methods to extrapolate the known distance travelled to the likely distance travelled by vehicles would need to be investigated. Garage postcode of the registered vehicle, or ASIC industry code for example, may be useful attributes to apply an extrapolation.</p> <p>The NHVR receives over 4.5 million vehicle sightings a month across 106 cameras. If we received additional sightings feeds, particularly in metro areas, the survey could be quite comprehensive, with rolling data available at any time, not just as a result of a defined survey. It would also leverage existing investment already made by road agencies in ANPR technology.</p> <p>The NHVR believes there could be an opportunity for the NTC to work with our technology team to explore opportunities to use this data which may, to some extent, compensate for the loss of SMVU data.</p> <p>The NHVR also recognises the advancement of heavy vehicle data derived from telematics, which potentially could be used as a replacement source for usage data. The NHVR is aware that a significant number of road operators use telematics to manage their fleets. The use of telematics is growing in Australia and worldwide. According to a study, 'the number of fleet management systems in active use in Australia and New Zealand is forecasted to grow at a CAGR of 16.4 per cent from almost 0.8 million units at the end of 2017 to nearly 1.7 million by 2022.'</p> <p>However, the willingness for road operators to provide this information to government or statutory organisations remains unclear. Governments would need to work with industry</p>	Noted. The NTC will consider this in any future work on replacing usage data currently sourced through the ABS SMVU.

			and road managers to understand how to leverage industry data and the incentives that would be provided to industry in return.	
ARTC	7	PAYGO – review of equivalent standard axle values	[Supports] The update of ESA values based on analysis of truck usage using current data rather than 25-year-old data	Noted.
ATA	7	PAYGO – review of equivalent standard axle values	<p>The ESA and AGM values recommended in the PTT report should be adopted, subject to resolving:</p> <ul style="list-style-type: none"> ▪ light vehicle ESAs ▪ ESAs for RFS equipped heavy vehicles. <p>... We do, however, have technical concerns about:</p> <ul style="list-style-type: none"> ▪ the allocation of ESAs to light vehicles ▪ the need to discount heavy vehicle ESAs to reflect the use of road friendly suspension systems ▪ other minor issues related to the ESA calculations, which could be resolved bilaterally between PTT and the ATA engineering team. 	We note the feedback provided on the revised ESA values. After further discussion with the consultant, the alternative light vehicle values provided by the ATA cannot be substituted for the values recommended by PTT without causing the relative ESAs between other vehicle classes to become implausible. Previously, the ESA values for cars and passenger vans were set to zero. From this perspective, the proposed values are an improvement. Overall, we are confident that the revised ESAs are an improvement on historical ESAs. Therefore, we recommend to use the revised ESAs calculated by PTT for now, with the option to investigate and refine the light vehicle values further in the future. We note that this will not have an impact on actual heavy vehicle charges under the recommended three-year fixed price path.
Bus Industry Confederation	7	PAYGO – review of equivalent standard axle values	Cost allocation should be based on economic cost drivers, which will often need a strong engineering base, and the best such estimates should always be used. Given that there is a difference in the allocation proportions as between the NTC approach and that used in Option C (the Victorian approach), there can be no certainty that the NTC approach is correct. The substantial increase in bus charges that follows from applying the changed NTC assumptions about ESA-kms, as illustrated in this submission, should be recognised and steps taken to mitigate this adverse impact, given the demonstrated uncertainties in the ESA-km values, as between the NTC approach and the Victorian approach in the report. A major review of the whole cost allocation process is needed.	Noted. It is not clear whether further research would deliver a definitive answer on cost allocation, regardless of whether an engineering or econometric approach is used. All cost allocation approaches generally involve a degree of judgement which is one of the reasons it is difficult to find consensus on this issue.
NatRoad	7	PAYGO – review of equivalent	The CRIS and the PAYGO methodology does not refer to the SAR methodology in assessing pavement damage. The design traffic loading for flexible pavement design is – for each relevant damage type – the total number of Standard Axle Repetitions (SAR)	Light vehicle traffic is taken into account, and the total number of ESA-km for light vehicles has actually increased using the new values

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		standard axle values	<p>during the design period which cause the same damage as the cumulative traffic. Without that element the use of ESA data by itself is, we contend, not indicative of real world experience, a matter made clear in Queensland where the SAR concept has supplemented the ESA calculations on this basis ...</p> <p>NatRoad continues to reject the assumption that heavy vehicles are responsible for close to 100% of pavement damage, especially in light of the fact that the re-examination foreshadowed in the above quoted paragraph that is now announced as being undertaken via the discussion in the CRIS, has led to the outcome that the heavy vehicle sector ESA-km attributable cost are recommended to be increased from 94 per cent currently to 99 per cent. The assumptions that lead to this outcome are that articulated and light vehicles are now attributed an ESA value. But this analysis is controversial, especially as it does not encompass matters such as 'road friendly suspension' or other damage ameliorating technology. In addition, the underlying assumption that roads built for heavy vehicles will not be damaged by light vehicle traffic, we believe, does not hold, as clearly volume of traffic is a relevant variable and the volume of light vehicle traffic must be taken into account ...</p> <p>Rather than rely on a change that increases costs to the heavy vehicle sector, NatRoad's view is, as previously articulated in this submission, that the current charges plus inflation should be used until HVRR is introduced. This view is further reinforced by the controversy around ESA and SAR values with the need to ensure that HVRR is underpinned by the most robust and up-to-date research and methodologies about pavement damage. That work requires a great more detailed research and analysis that better reflects the actual damage caused by trucks, along the lines of the outcomes reflected in the ATA's Truck Impact Chart.</p> <p>Our answer to question 7 therefore is no, use the former ESA values until the parameters for an HVRR FLCB are established and better accompanying work on pavement damage is done that reflects real world experience. That is particularly the case in light of the difference between the PAYGO model's ESA-km calculations and cost allocation being based on the entire road network being sealed, when, as the below discussion shows, only about 40% of the network is sealed.</p>	<p>(87.3 m ESA-km rather than 72.8 m). The reason for the increase from 94 per cent to 99 per cent of ESA-km by heavy vehicles simply reflects the large increase in ESAs for heavy vehicles, correcting what was previously an under-representation of their ESAs (e.g. based on outdated data).</p> <p>In addition, it is only the attributable costs (using the ESA-km allocator) that have the strong allocation to heavy vehicles. There remains a significant proportion of common (non-attributable) costs for road rehabilitation and periodic maintenance that are allocated based on VKT.</p>
NHVR	7	PAYGO – review of equivalent standard axle values	The NHVR supports the use of updated ESA values to improve the accuracy of the PAYGO model.	Noted.

Philip Laird	7	PAYGO – review of equivalent standard axle values	Overall, the continued use of parameters including vehicle kilometres, weighted vehicle kilometres, passenger car equivalents and equivalent standard axles (revised as suggested in the report to reflect increasing weights) is supported.	Noted.
ARTC	8	PAYGO – cost allocation	<p>ARTC has previously provided extensive submissions to the NTC on the issues of cost allocation to heavy vehicles. ARTC’s position has highlighted a concern with the effective treatment of heavy vehicles as the incremental user of roads which delivers a lower allocation than if heavy vehicles were treated as an equal user of the network with light vehicles.</p> <p>The 2017 analysis from HoustonKemp provided as part of the consultation confirms this position; noting this was provided to confirm the efficient nature of the PAYGO model given the recovery of costs is between the incremental and standalone cost of the infrastructure. Further noting that this analysis was undertaken in 2017, however, the key conclusions were that the ‘true’ incremental cost base in 2017 was \$2.3b and standalone was \$7.4b. Whilst revenue was at \$3b in 2015–16, with revenue freezes and leakages, this gap would be significantly lower now; confirming ARTC’s longstanding position that heavy vehicles are treated as the incremental user of the road network ...</p> <p>... The combined effect of the lack of an access framework, the failure to charge for the true costs of heavy vehicle usage, the under recover of even incremental cost bases and the excess consumption so caused is to drive a market failure in the freight transport market.</p>	Noted. However, the NTC considers that the proposed allocation of costs between light and heavy vehicle lies broadly within the efficient range, and therefore is unlikely to be the cause of any market failure in the freight transport market.
ATA	8	PAYGO – cost allocation	<p>The PAYGO cost allocation matrix should not be amended in this determination.</p> <p>... HoustonKemp concluded that it would be reasonable to maintain the existing allocation approach in the PAYGO matrix, and pointedly said— in our opinion there exists no strong evidence for departing from the existing approach to allocating ‘road pavement and shoulder maintenance’ costs at this time.</p> <p>The cost allocations for expenditure category B2 should not be changed ...</p> <p>... The Victorian estimates should not be used in the 2021 determination, but the ATA acknowledges that they may, with further development, be a valuable contribution to the future debate about heavy vehicle charging.</p>	Noted.
Bus Industry Confederation	8	PAYGO – cost allocation	Yes, provided that a review of the ESA-km process is undertaken. Implementation pathways are of greater concern, as discussed below.	Noted.

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NatRoad	8	PAYGO – cost allocation	<p>We agree with the observation in the C-RIS that ‘the motivation for considering change may include that some options may be more accurate than others. On the other hand, the value of added precision is likely to be limited by the highly averaged nature of heavy vehicle charges.’</p> <p>This is another fundamental problem with the extant cost models: that high level of averaging is not necessarily reflective of reality.</p> <p>...The three options show respectively an estimated gap or shortfall of 10.7% (current method), 14.1% (modified current) and 21.3% (new – the Victorian model). If translated to the proposed determination, these levels of increase are all well beyond what the industry is able to absorb, a key consideration in answering question 8 and in reinforcing the NatRoad solution to the problem of how to set heavy vehicle charges until the HVRR model can be implemented.</p> <p>In the NatRoad submission dated 12 March 2021 to the NTC on heavy vehicle charges we emphasised the inability of the industry to absorb cost increases. In particular, the pandemic conditions are still entrenched and economic fragility cannot be underestimated. Conditions remain precarious, especially in light of the now extended NSW/Greater Sydney and Victorian lock downs. We continue to rely on the March 2021 submission.</p> <p>Annual growth over the past 5 years has been estimated as minus 3.2%, with the industry profit margin at 2.4%. Accordingly, even with the NatRoad suggestion that the current charges be indexed for inflation annually or be indexed at the lower fixed percentage proffered by the NTC, many industry members will be adversely affected even by this increase because it is an increase in operating costs that they have little or no ability to absorb or pass on to customers.</p> <p>Accordingly, the NatRoad answer to Question 8 is utilise the current model and apply the solution proposed in paragraph 4 of this submission. Increasing costs by the percentage figures shown in paragraph 45 of this submission would have an adverse effect on NatRoad’s members, particularly its smaller members.</p>	Noted.
NHVR	8	PAYGO – cost allocation	<p>The NHVR understands that the bridge stock in Victoria is, on average, older in years; that the average span length of the bridges is longer; and that there is a higher proportion of simply supported bridges than bridge structures across most of Australia. Consequently, it could be assumed that the cost to maintain, rehabilitate or improve bridge structures in Victoria is likely to be greater.</p> <p>Bridge costs would contribute to the overall engineering pavement costs estimated in the</p>	Noted.

			<p>VIC DTF/DOT model. This may explain why the VIC DTF/DOT cost allocators reflect a higher cost base, by up to more than 10 per cent, than either the current or modified current heavy vehicle cost base. The NHVR is uncertain if pavement design standards in Victoria are different from other jurisdictions, and the characteristics of bridge stock in Victoria as outlined above could be a potential reason for cost differences compared to the other cost case approaches.</p> <p>The NHVR supports this determination being centred on the 'current' or 'modified current' heavy vehicle cost base approach. For reasons stated, the NHVR would have some concerns if the VIC DTF/DOT cost allocators approach was considered in this determination.</p>	
ALRTA	9	PAYGO – MaxMan	The removal of the MaxMan module with the continued waiving of road related charges for dollies. In our view, MaxMan is too complex and is not achieving the intended policy outcome. The dolly discount is a practical mechanism for simply applying an appropriately targeted discount for vehicles restricted to lower quality parts of the road network.	Noted.
ARTC	9	PAYGO – MaxMan	[Supports] The removal of MaxMan from the model given its complexity does not provide any significant benefit ...	Noted.
ATA	9	PAYGO – MaxMan	The ATA agrees that the MaxMan module should be removed from PAYGO The MaxMan module adds to the complexity of PAYGO and does the opposite of what it was intended to achieve. It should be removed.	Noted.
Bus Industry Confederation	9	PAYGO – MaxMan	Yes. The underlying rationale may not be relevant now.	Noted.
NatRoad	9	PAYGO – MaxMan	<p>The NatRoad strong position is that where any truck or combination can't use a road, the cost of that road should not be applied to the heavy vehicle cost base for that vehicle or vehicle type.</p> <p>Whilst NatRoad generally holds to the view that no changes to the PAYGO model should be made in light of our suggested solution set out in paragraph 4, in this instance we would agree with the removal of MaxMan.</p> <p>Road trains are the only vehicle classes treated separately through the MaxMan system. No adjustment is made for any other vehicle classes, even though there are frequently restrictions preventing use or which constrain operators' choices not to use other vehicle combinations in certain areas. That factor alone indicates that the model will not be adversely affected by the removal of MaxMan. This observation also emphasises the principle which underpins the stance taken in this submission: denial of access should mean that no payment for the relevant road's construction applies to heavy vehicles.</p>	Noted.

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NHVR	9	PAYGO – MaxMan	Agreed. The uptake of road trains has significantly increased over recent years, with greater access being approved for the use of A-doubles for containerised transport to and from ports. MaxMan offers no material value in differentiating cost in the broader context of the PAYGO model.	Noted.
ARTC	10	PAYGO – RUC leakage	<p>[Supports] The inclusion of the 4.8% revenue factor to reflect the impact of RUC exemptions and leakages be applied to ensure that the revenue target accurately reflects the cost base.</p> <ul style="list-style-type: none"> ▪ ARTC understands the revenue used in table 19 to highlight the estimated revenue gap does not account for this leakage. ▪ The current revenue gap to the (inadequate) allocated cost base is therefore 16.2% not 10.7%. ▪ As above, this under recovery of a cost base which minimises the costs of road usage contributes to the market failure in the freight transport market, imposing significant externality costs to the Australian economy. 	Noted.
ATA	10	PAYGO – RUC leakage	<p>The NTC should not adjust the SMVU fuel consumption estimates to take into account the RUC exemptions for auxiliary fuel use.</p> <p>If, however, the NTC decides to press on with approach 2, it should recalculate its estimates of auxiliary fuel use to:</p> <ul style="list-style-type: none"> ▪ completely exclude fuel used in refrigerated trailers with separate tanks ▪ use the BMHV rate of 1.6 per cent as a more representative rate. <p>An advantage of this approach is that would address many of the data quality concerns raised in the RIS.</p> <p>... The ATA's assessment of approach 1 is set out in row 2 of table 2. The NTC assessment does not take into account a major advantage of retaining the status quo: it is internally consistent with the NTC's recommended approach to registration charge concessions ... There is no conceptual difference between the registration charge concessions and the RUC exemptions. They both represent a positive legislative or quasi-legislative decision to forgo revenue in favour of achieving a valued objective.</p> <p>The ATA's assessment of approach 2 is summarised in row 4 of table 2. The NTC's approach to recalculating the fuel consumption figure is not conservative. It would overestimate the fuel use that is now exempt from the road user charge and over recover the heavy vehicle cost base.</p> <p>... The 10 per cent rate for refrigerated vehicles includes all fuel used in the vehicles –</p>	<p>The NTC considers that there is a conceptual difference between registration charges and RUC exemptions. In the case of registration charges, the national charges are set with the aim of fully recovering a given proportion of the heavy vehicle cost base. States and territories then actively provide concessions to achieve defined goals. In terms of the RUC exemptions on fuel used in auxiliary services, the issue is that the courts have found that RUC is not payable on this fuel. The result of this is that, historically, RUC was set using an amount of fuel use that was too high. The PAYGO model still has the objective of recovering a proportion of the identified heavy vehicle cost base from the amount of fuel that is subject to RUC. Therefore, adjusting the fuel use estimate for a conservative estimate of the amount of fuel not subject to RUC is appropriate. If we did not factor in this correction, the RUC would knowingly be set to not fully recover the identified cost base. However, we acknowledge that our original estimate of fuel used for auxiliary purposes included fuel in</p>

			<p>including fuel sourced from trailer fuel tanks. But this fuel use is not included in the SMVU fuel consumption figures, because the SMVU excludes trailers...</p> <p>... The NTC modelling assumes that all businesses who claim fuel tax credits claim for off-road use at the relevant percentage rate. In the ATA's view, it is not reasonable to assume that small businesses are aware of their ability to claim auxiliary equipment exemptions. In fact, the ATO recently introduced the basic method for calculating fuel tax credits for heavy vehicles (BMHV) to address the underclaiming by small businesses. The BMHV includes a standard 1.6 per cent allowance for off road and auxiliary equipment.</p>	<p>separate tanks in refrigerated trailers. We have since amended our estimate to correct this. As a result our estimate of the percentage of total fuel used for auxiliary purposes has decreased from 4.8 per cent to 4.0 per cent. We believe the methodology underpinning this model is reasonable and likely to be conservative because it assumes all operators claim ATO safe haven rates, which reflect the minimum percentage eligible operators can claim.</p>
Bus Industry Confederation	10	PAYGO – RUC leakage	<p>The fuel use in question has nothing to do with road damage so should not be counted as part of the charging base, as a general principle.</p>	Noted.
NatRoad	10	PAYGO – RUC leakage	<p>The short answer is 'No'. NatRoad has previously indicated to the NTC (and as recently as during the NatRoad webinar on 28 July 2021) that a comprehensive re-assessment of the fuel tax system should be undertaken as an urgent policy reform. We note that the NTC has concluded that changes to the road user charge as a tax base are out of scope in the current exercise.</p> <p>At the same time as reaching that latter conclusion, however, in the C-RIS the NTC sets out a critique of some aspects of the fuel tax regime claiming 'leakages' from the fuel tax system that affect the cost base. Essentially, the NTC is saying that the system is losing revenue because of the proper, legal application of the fuel tax system. That analysis encompasses proposed legislative change, that is a change to the <i>Fuel Tax Act 2006</i> (Cth) 'to make all fuel used on public roads subject to RUC (even if used for auxiliary equipment).'</p> <p>The ATO recently released its tax gap analysis – the difference between the amount of tax collected and its assessment of what should have been collected. Overall, it shows a \$31 billion gap (revenue which should have been collected if every taxpayer was fully compliant with the law). For fuel tax credits, it actually shows a negative gap of \$7.1 million (meaning FTC was underclaimed by claimants, the opposite of a 'leak' from the system). This latter finding accords with NatRoad's view of the poor utility of the fuel tax credit system, a matter separately communicated to the NTC on 30 June 2021.</p> <p>Clearly, the fuel tax system is in need of reform, a matter that the Commonwealth has recognised ...</p> <p>Hence, the NTC has strayed into recommending a policy change, apparently out of scope in relation to underlying policy issues but still contemplated by the NTC. That policy</p>	<p>While legislative change was included as a possible option in the analysis for completeness, it was not the recommended option. Also, the fact that there is a negative tax gap does not necessarily imply that there is no leakage from auxiliary equipment. It means that overall the ATO has estimated that claimants have under-claimed rebates for which they are eligible. The fuel tax credit expense runs to \$8 billion a year and comprises various use cases, including the mining industry (see link below). The ATO's negative tax gap figure does not distinguish between the different use cases (including on-road use vs auxiliary equipment). For example, it could be that there is substantial leakage through auxiliary equipment, but this is more than offset by some miners not (fully) claiming what they are entitled to, resulting in a negative tax gap estimate by the ATO. The key question for this determination is whether the NTC should correct the estimated fuel consumption from the SMVU to account for the proportion of the consumption on which RUC is not paid, given the uncertainty over the quality of the data (there are various assumptions involved and</p>

			change would be biased against NatRoad members and other transport operators when a full review of the fuel tax system is a pressing reform and a matter that we believe the NTC should be advocating rather than the sort of reform proposed in the CRIS. There is no 'leakage' per se, merely the application of current tax policy.	the SMVU data itself may not be that reliable). However, the NTC considers that it has a responsibility to ensure, as far as possible, that its estimates of the total amount of fuel use on which RUC is paid are as accurate as possible. From this perspective, using a conservative estimate of the amount of fuel not subject to RUC is an appropriate solution. Link from The Australia Institute: https://australiainstitute.org.au/post/and-the-award-for-biggest-fossil-fuel-subsidy-goes-to-the-fuel-tax-credit-scheme/
NHVR	10	PAYGO – RUC leakage	Based on the argument presented in this section, it appears approach two offers the methodology to improve the accuracy of calculating fuel consumption for heavy vehicle transport. However, noting that this approach relies in part on an estimation of fuel consumption derived in part from SMVU data to recalculate the RUC, it presents a problem in terms of accuracy over the longer period given the ABS has stopped conducting the SMVU. The model will be less accurate the older the SMVU data gets.	Noted.
ALRTA	11	PAYGO – unsealed road travel discounts	Continuation of an unsealed road travel discount and updating of the percentages used to calculate the discount. ALRTA supports retention of the unsealed road travel discount and is currently in the process of collecting member survey data for supply to the NTC.	Noted. The NTC is recommending that the unsealed road discount be retained in its current form, with the potential to revise percentages if better quality information on the amount of unsealed road travel can be obtained.
ARTC	11	PAYGO – unsealed road travel discounts	[Supports] The recommended review of unsealed travel road discounts	Noted.
ATA	11	PAYGO – unsealed road travel discounts	Yes. The NTC should retain the unsealed road travel discount, but its value should be reviewed based on evidence gathered through the 2021 unsealed road travel survey. The PAYGO model cost allocators assume that the entire road network is sealed. Of course, this is not the case. Some 66 per cent of the road network is unsealed, so the model includes a discount for road train and B-triple travel on these roads. In the RIS, the NTC argues that the discount addresses a legitimate issue concerning the PAYGO cost allocator assumption that the entire network can be treated as sealed, but that a new industry survey should be conducted to review its value.	Noted. The NTC will investigate whether better information on travel on unsealed roads can be obtained in the future, either through a new survey or through a new source of data to replace the SMVU.

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			The ATA agrees with this approach. We provided the NTC with technical comments on its draft survey, and it has now been distributed through relevant ATA member associations.	
Bus Industry Confederation	11	PAYGO – unsealed road travel discounts	The cost base should accurately reflect road usage patterns, the damage associated therewith and the costs of rectification. All elements in the cost allocation process need to be refreshed on a regular basis. This is a longstanding example and should be refreshed.	Noted.
NatRoad	11	PAYGO – unsealed road travel discounts	<p>The discussion that leads to the posing of this question contains a statement that reveals another weakness/defect in the PAYGO model: The PAYGO model assumes that all the road network is sealed in the application of its cost allocators, which is particularly relevant to the ESA-km cost allocator.</p> <p>This is a brave assumption when in 2019 one expert estimated that around 500,000 km (60% of the total road network) of public roads are unsealed.</p> <p>... The discussion in the CRIS then shows the effects of applying the discount to road trains and B-triples (the discount is not more widely applied) whether MaxMan is used or not. The result is that the attributable costs for these vehicle classes is 14–17 per cent lower than would otherwise apply. The application of that discount is supported. But the discount should be better applied to not just the indicated vehicle types but to all journeys by heavy vehicles on unsealed roads.</p> <p>The use of a survey is supported (and was assisted by NatRoad in line with the request made by the NTC on 2 August 2021 and subsequently where we sought member feedback on a form of survey agreed by the NTC) and the process is supported so long as it leads to a fundamental reduction in heavy vehicle charges that better reflect the use of unsealed roads for all categories. That broader consideration should not, in any way, affect the discount provided to road trains or B-triples and they should benefit from its application. Survey results will be communicated post the 31 August 2021 closing date for receipt of responses.</p>	The use of these discounts doesn't necessarily directly benefit the vehicles targeted by them (in terms of changing the relative charges compared with other vehicle classes). The discounts reduce the attributable costs for the affected vehicle classes (road trains and B-triples), as well as reducing the overall heavy vehicle cost base. The revenue collected by road trains is well above the attributable cost 'floor', meaning it is only through the latter mechanism that road trains actually benefit. Given that the attributable cost 'floor' is non-binding, shifting it up or down slightly based on the unsealed road and CSO discount is relatively immaterial because the relativities of charges for road trains will not change (the policy when recalculating charges is to generally scale all charges by the same amount to recover the new cost base target, and then alter relativities only if constraints regarding cross-subsidy checks are not met). Thus the small benefit is derived by both the unsealed road and CSO discounts reducing the overall heavy vehicle cost base, with all heavy vehicle charges scaled to slightly lower than they would otherwise be.
NHVR	11	PAYGO – unsealed road travel discounts	Since the last unsealed travel discount has not been reviewed since 2005, the NHVR supports the NTC undertaking a new survey of industry in time for application to the final RIS. The survey results will inform the appropriate percentages to (or if it should) be applied for unsealed road travel discounts in the PAYGO model.	Noted.

ALRTA	12	PAYGO – CSO discounts	Continuation of community service obligation (CSO) discount for double and triple road trains. This is a minor, but important component of the PAYGO model, which must be maintained as a matter of principle. As NTC would be aware, CSO's are a significant focus of the separate Heavy Vehicle Road Reform process. As such, it would be inappropriate to remove the CSO component from PAYGO at this time.	Noted. See response to ATA submission on this issue.
ARTC	12	PAYGO – CSO discounts	[Supports] The removal of the CSO discount from PAYGO given the difficulty in assessing it; noting if governments wish to apply a form of CSO payment, a more direct application of such a measure would be appropriate.	Noted.
ATA	12	PAYGO – CSO discounts	The CSO discount in the PAYGO model should not be discontinued. It should be retained and expanded, as part of a whole-of-government response to the report of the House of Representatives Indigenous Affairs Committee on food pricing and food security in remote Indigenous communities.	The NTC notes that the CSO discount has almost no direct bearing on the charges paid by road trains because its effect in the PAYGO model is to slightly reduce the attributable cost for both classes of road trains (whose attributable cost is significantly below the amount of revenue collected through registration and RUC). In these circumstances, a slight increase or decrease to the attributable cost will have no direct effect on the registration charges paid by the vehicle class because there is no need to alter the charging relativities in the model (to avoid cross-subsidisation). Instead, the impact of the CSO discount is to slightly reduce the overall heavy vehicle cost base, which (very slightly, given the magnitude of the CSO discount) reduces the charges paid across all heavy vehicle types. The NTC acknowledges the points made by the ATA and supporting evidence supplied. However, there are likely to be more effective and better targeted policy approaches by governments to help achieve these goals.
Bus Industry Confederation	12	PAYGO – CSO discounts	All potential external costs and benefits (and merit goods) of road use should be part of the way road use is priced and PT fares are set, not just access to remote and rural areas. Rather than assuming a CSO, specific research is needed to demonstrate the nature of the CSO, its scale and how it relates, or otherwise, to road access conditions. Road pricing reform, including CSOs/externalities, should be central to the NHVR process.	Noted.

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NatRoad	12	PAYGO – CSO discounts	<p>The issue of community service obligations has already been touched on in this submission. NatRoad supports work being developed in this subject area that builds on the Austroads' report, referenced in paragraph 14 of this submission. That work should form part of the HVRR process, noting that the relevant Austroads' report sets out a number of bases on which policy might be advanced depending on a number of underlying assumptions.</p> <p>The work to best determine the philosophical and/or economic basis for the community service obligation is for the future. The NatRoad view for the present is that the policy basis set out in the CRIS for taking into account community service obligations is narrow and reactive. The CRIS notes that the matter was considered solely on the basis that a discount should apply to remote areas because road expenditure is often not warranted by traffic levels but is necessary to support these communities ...</p> <p>... The difficulty in dealing with the issue of community service obligations arises because there is no agreed basis for applying those obligations amongst governments or amongst industry participants more generally. But that is not a reason to discontinue the application of the discount, as proposed by the NTC.</p> <p>Whilst the current discount is assessed as lowering the cost base by 2 per cent when compared with what it would otherwise be, that is also not a sufficient justification for its removal. NatRoad is of the firm view that the industry's community service obligations have been highlighted in the current pandemic. There should remain at least the current discount for this element of the reality of the transport task. Hence, in answer to the question, we say 'No.' We do not agree with the discontinuance of the relevant discount. Again, we would counsel against disturbing the current model given the solution we have proposed.</p>	Noted.
NHVR	12	PAYGO – CSO discounts	While the NTC estimates that the combined impact of the unsealed road travel discount and the CSO discount will lower the heavy vehicle cost base by about 2 per cent, it is worth noting that this is based on information that was last reviewed in 2005. The NHVR recommends that the NTC liaise with road authorities to identify current road expenditure that meets CSO criteria to update the PAYGO model, and then determine if the CSO discount will make a material difference to the cost base.	Noted.
ARTC	13	PAYGO – heavy vehicle concessions	[Supports] The exclusion of concessions from the model; again noting the payment of any such concessions, given the potential competitive impact on the freight transport market, should be open and transparent and not built into a model's logic.	Noted.
ATA	13	PAYGO – heavy vehicle concessions	Agreed. The 2021 PAYGO determination should not consider registration charge concessions; however, the NTC should publish an annual estimate of their cost ...	Noted.

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			... The cost of the revenue foregone from these concessions is borne by the governments that offer them. The lost revenue is not recovered from other heavy vehicle users through the PAYGO model.	
Bus Industry Confederation	13	PAYGO – heavy vehicle concessions	Yes.	Noted.
Marco Mens	13	PAYGO – heavy vehicle concessions	<p>In the last 5 to 10 years the growth in Primary Producer registered trucks on our roads has exploded. When they are not carting their own produce, these trucks are on the road carting produce on a commercial basis ... Recent attempts by VicRoads to clamp down on this practice has fallen over during the court process, due to a loophole in sloppy legislation.</p> <p>In conclusion Primary Producer registration has led to a distortion in the transport industry. Commercial operators like myself, are now subsidising farming groups to run trucks (even encouraging) on a discounted basis. Many commercial operators feel they have no choice but to register their equipment with the Primary Producer concessions, so they remain competitive.</p> <p>Are these subsidies coming out of road funding? If so, this would explain the deterioration in our road network.</p>	<p>This issue is out of scope to address directly through the determination. The NTC does not determine concessions, which are set individually by each state and territory government. However, the NTC can report back to ministers on the estimated revenue foregone due to the use of concessions to provide more transparency on this issue. Governments may then choose to use this information to reassess the offering of concessions, including whether to attempt to achieve more consistency between jurisdictions.</p> <p>The NTC notes that the NHVR has recently added primary producer concession information to its Registration Checker app, which may help to reduce misuse of these concessions (Prime Mover, 2021).</p>
NatRoad	13	PAYGO – heavy vehicle concessions	<p>NatRoad is opposed to market distorting concessions by way of discounts offered to some charities and to primary producers. It is the latter concession in particular that is opposed given the unlevel playing field that eventuates and having regard to the number of complaints NatRoad receives about the abuse of the primary production concession.</p> <p>The C-RIS indicates that because the financial impact of concessions is borne by the jurisdictions that offer them, concessions have been treated as a matter for states and territories to decide individually in previous determinations. Concessions are not reflected in estimated revenue figures calculated using the PAYGO model and this is obviously an area where revenue falls below expected revenue on an unquantified basis. That is a weakness in the current system. That amount should be quantified but not to increase the registration costs to those who don't enjoy any concession.</p> <p>NatRoad believes that all concessions should be uniform between states and territories and, in relation to the primary production concession, there should be 'farm plates' in use</p>	<p>Noted. Enforcement matters and targeting of concessions to particular sectors or groups are out of scope for the determination.</p> <p>The NTC notes that the NHVR has recently added primary producer concession information to its Registration Checker app, which may help to reduce misuse of these concessions (Prime Mover, 2021).</p>

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			<p>to show that the concession has been applied for and granted to the relevant heavy vehicle operator. All concessions should be costed.</p> <p>NatRoad believes that there should also be a focus on tightening the rules around the primary producer registration concession at the same time as introducing uniformity in the concession around Australia. NatRoad receives frequent complaints about the abuse of this concession which has a major impact on competition because of high heavy vehicle registration costs and the industry's general low profit margins, discussed above. NatRoad does not oppose the concession being extended to genuine primary production endeavours but there is growing concern amongst NatRoad members that the abuse of the concession is rife.</p> <p>Accordingly, we ask the NTC to better focus on this matter and to seek from each state and territory government the following policy underpinnings:</p> <ul style="list-style-type: none"> ▪ recording of exemption conditions on the NHVR vehicle registration database, with those exemptions made publicly accessible; ▪ making this exemption information available to authorised officers on the roadside; ▪ during roadside intercepts, authorised officers should check if registration conditions apply, and if so, are these being complied with and this should be done as a matter of course; ▪ a clear legislated, consistent offence for misuse of primary producer registration; ▪ more frequent risk-based checking of known offenders; and ▪ a penalty that is a multiple of the registration costs avoided. 	
NHVR	13	PAYGO – heavy vehicle concessions	Agreed.	Noted.
ATA	14	PAYGO – electric heavy vehicles	<p>The ATA welcomes the consideration of electric heavy vehicles in the consultation RIS, but stronger actions are needed to prepare for the transition of the heavy vehicle fleet. Specifically:</p> <ul style="list-style-type: none"> ▪ electric heavy vehicle numbers are expected to grow substantially ▪ while not yet applying to heavy vehicles, state governments have begun implementing road user charges on electric vehicles ▪ the pace of development and release of new zero emission heavy vehicle models is accelerating. In recent months, Volvo has introduced a new electric truck into Melbourne and Hyzon have announced plans for hydrogen fuel cell trucks in Wollongong. The Fuso eCanter has been available since early 2021 and SEA Electric has revealed five new electric truck models in Australia. 	Noted.

			But there is no reliable data on the number of electric and hydrogen fuel-cell heavy vehicles. The ATA agrees with question 14 in the consultation RIS. The small number of heavy vehicles in the fleet today, the complexity that adjustments would cause to the PAYGO model and the difficulty in obtaining accurate data mean that electric heavy vehicles should not be included in this determination.	
Bus Industry Confederation	14	PAYGO – electric heavy vehicles	Yes. This is a transitional determination and EVs are not currently large in number. However, Australia must transition quickly to EVs in coming years, with the HV charging approach structured to cope with that switch. This should involve mass, distance, location pricing, using telematics (which will be more societal-cost reflective).	Noted.
NatRoad	14	PAYGO – electric heavy vehicles	The NTC recommends that given the insignificance of the heavy vehicle electric fleet at present that no adjustments be made in the current determination – hence, question 14 is posed. We agree.	Noted.
NHVR	14	PAYGO – electric heavy vehicles	Agreed. The current volume of electrical or hybrid-powered heavy vehicles, at 0.03 per cent of the national heavy vehicle fleet, is insignificant. Moving forward, governments will need to determine the charge for these vehicles line with their strategic approach to encouraging the uptake of modern and greener vehicles. Noting electric vehicles are heavier than the standard fleet.	Noted.
ATA	15	PAYGO – electric heavy vehicles	The ATA agrees with question 15 – the NTC should collect data on electric heavy vehicles – but a stronger plan is needed to position governments to incorporate zero emission heavy vehicles in the next determination or the FLCB pricing model. This should include: <ul style="list-style-type: none"> ▪ reform by the states and territories to collect consistent registration data on electric and hydrogen fuel cell heavy vehicles ▪ reflecting this data in the ABS motor vehicle census or a NEVDIS equivalent. This would also assist the design and evaluation of public policy for incentivising zero emission vehicles.	Noted.
Bus Industry Confederation	15	PAYGO – electric heavy vehicles	See answer to previous question. This must be monitored and a new pricing model developed over the next few years.	Noted.
NatRoad	15	PAYGO – electric heavy vehicles	We also agree that this area of change needs to be monitored, so our answer to Question 15 is also yes. The technology in this area is accelerating at a much greater rate for light vehicles than for heavy vehicles. Part of the issue is that for electric heavy vehicles to be a realistic technology, there is the need for the establishment of a network of charging	Noted. A reduction of the light vehicle fuel excise revenue base is not necessarily linked to a higher incidence of the tax on heavy vehicles (through the RUC).

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			<p>facilities both privately and publicly. In the USA, a recent survey found that 92 per cent of survey respondents said their facility is not 'very well equipped' to accommodate commercial charging needs. We believe that this percentage would also be high in Australia. In contrast, most light vehicles will simply be able to be charged at home, most likely overnight.</p> <p>As discussed above, the current fuel tax regime needs a substantial overhaul. There are several factors which point to the need to reframe this tax regime as soon as possible. Continued improvements in the fuel efficiency of the light vehicle fleet in Australia are likely to contribute to a further slowing of the growth in total fuel consumption, in turn constraining growth in fuel excise in general and therefore placing more of the incidence of the tax on heavy vehicles and making the heavy vehicle charging regime even more onerous for the heavy vehicle sector as the tax base shrinks.</p> <p>The uptake of electric vehicles will further accelerate the rising fuel efficiency of the light vehicle fleet in Australia. Electric vehicles are currently a small proportion of the market and are therefore having little effect on fuel excise receipts at the present time. But electric vehicles are projected to represent around 19 per cent of the light vehicle fleet in Australia by 2036–37. The impact on fuel consumption of an increasing uptake of electric vehicles will further erode the fuel excise base, underlining that this is not a sustainable tax and one where the whole basis of the RUC is called in question.</p>	
NHVR	15	PAYGO – electric heavy vehicles	The NHVR supports the recommendation that all jurisdictions in future provide regular reports on electric, hydrogen and combustion heavy vehicles by type to the NTC to evaluate the impact of the vehicles for post-2021 Heavy Vehicle Road Reform.	Noted.
ARTC	16	PAYGO – recovery of regulatory costs	[Supports] The recovery of regulatory costs based on most recent (and therefore updated) data.	Noted.
ATA	16	PAYGO – recovery of regulatory costs	Regulatory charges under this determination should be set using the existing methodology, but with updated information on weight, distance travelled and the registered heavy vehicle fleet. The ATA agrees that the existing formulas for recovering the NHVR's charges work well, and that it would be appropriate to recalculate the charges using the latest information.	Noted.
Bus Industry Confederation	16	PAYGO – recovery of regulatory costs	Registration – regulatory cost component, to recover the costs of running the NHVR. NTC (2021) Table 18 shows that this charge component comprises the highest proportion of total registration charges for 2 classes of bus: 2-axle buses > 12 tonnes, where it is 51.9% of total registration charges; and 2-axle buses up to 12 tonnes, where it is 39.8% of the total registration charge. The next highest proportion is 32.1% for 2-axle trucks < 12 tonnes.	Noted. While the regulatory component represents a relatively high proportion of the total registration charge for these two types of buses (as calculated by the BIC), the NTC notes that the high regulatory component proportion in part reflects the relatively low

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			<p>Given the good safety record of buses, it is hard to see why such a relatively large cost burden should be placed on bus to fund the operations of the NHVR, an organisation that seems unlikely to be required to do much work on bus, relative to truck. The costs of running the NHVR should be more cost-driven, determined by the work that is required across different sectors and vehicle classes. While this might only amount to a small reduction in bus charge payments, it would at least represent progress in funding the regulator more from those who are its raison d'être, rather than penalising those who do the right thing. This is a further reason for undertaking a major review of the cost allocation process over the next couple of years.</p>	<p>roads component of registration charges for these vehicles. The absolute value of the regulatory component registration charge for buses remains relatively low compared with other heavy vehicle classes and is broadly comparable to the regulatory component charges for rigid trucks.</p> <p>Further, the NTC notes that the recommended changes to ESA values and cost allocation suggest that the roads component of registration charges would need to increase significantly for the heavier types of buses to achieve cost recovery and ensure no cross-subsidisation. If this increase to the roads component of registration charges were implemented, it would have the effect of reducing the proportion of the total registration charge that is comprised of the regulatory component.</p>
Bus Industry Confederation	16	PAYGO – recovery of regulatory costs	<p>As illustrated in this submission, the formula used imposes the highest relative registration cost share on 2 classes of buses, which seems the opposite of what a cost-driven approach should produce. Why should a relatively safe mode, with established safety systems (including accreditation in most cases) be hit hard by the costs for a regulator? The costs for a regulator should be highest on those who most need to be regulated, for reasons such as their poor safety record, not on those with long established safety practices, with their own regulatory underpinnings. The cost drivers here need more thought.</p>	<p>Noted. It is important to note that introducing a regulatory component of registration charges was introduced primarily as a mechanism to recover the cost of the NHVR's operations that are not subject to cost recovery through fees across the heavy vehicle fleet. The formula to calculate the regulatory component of registration charges for each vehicle class was designed with the primary aim of achieving a reasonable outcome while maintaining the broad relativities of total registration charges between different vehicle classes. It was never intended to deliver an accurate price signal reflecting the safety record or other attributes of individual operators or types of operators. Therefore, the NTC continues to believe that the current mechanism achieves appropriate outcomes given the broad aim of the formula and the available data.</p>

<p>NatRoad</p>	<p>16</p>	<p>PAYGO – recovery of regulatory costs</p>	<p>The CRIS notes the following: As part of this determination, we have reviewed the current approach to ensure it meets the following key objectives of ensuring that:</p> <ul style="list-style-type: none"> ▪ the regulatory component of registration charges continues to provide the NHVR with enough revenue to fund its approved budget ▪ the costs of operating the NHVR are allocated between different heavy vehicle types on a reasonable basis. <p>We are not sure how the notion of reasonableness has been applied in this context. It is not articulated. Nor do we understand what evidence exists for two relevant assertions. The first assertion is that ‘the process of scaling regulatory charges up or down to reflect changes in the NHVR’s budget or the vehicle fleet have also worked.’ What is the evidence for this statement? How was that view reached? Is it the position of the state and territory regulators? The industry view is that there is insufficient transparency in the process. The industry view accords with the findings of the Productivity Commission as follows: ...</p> <p>... The second assertion is that ‘The process of asking ministers to approve both the NHVR’s budget and, subsequently, the resulting regulatory charges, has proven to be relatively onerous.’ There is no data or argument about how this proposition is reached; relative to what? But on the strength of that assertion it is then argued that: ‘It could be desirable to develop a process that would automatically adjust regulatory charges to recover the approved NHVR budget. We disagree that automatic adjustments should be made. Increased transparency and appropriate benchmarking of regulatory costs are necessary...</p> <p>... The C-RIS does not confront the notion of better scrutiny of the NHVR’s budget nor greater transparency along the lines suggested by the Productivity Commission ...</p> <p>We believe further work needs to be undertaken to better increase transparency of funding and accountability. We therefore agree that the current mechanism of Ministers agreeing the regulatory charges each year should be continued. Further, the NHVR budget should continue to be met from the heavy vehicle charges that are set and indexed in the NatRoad preferred method. But these steps should be accompanied by greater transparency measures both in the flow of funds from state and territory governments and in relation to levels of expenditure for regulation of the industry.</p> <p>Hence our answer to Question 16 is yes. But with the caveat that greater transparency must be applied to the regulatory charges (at the very least the jurisdictions must separately show that amount in their accounting to industry).</p>	<p>Noted. The key point of the recommended approach is that the primary mechanism for ministers to scrutinise the NHVR’s budget proposal is their approval of the budget, rather than the secondary step of approving the regulatory component of registration charges to recover the already approved budget. Information on how much revenue the NHVR receives from the regulatory component of registration charges is available in the Statement of Profit or Loss in the NHVR’s annual report, including the funding amounts provided by each jurisdiction (provided as a note below the statement).</p>
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NHVR	16	PAYGO – recovery of regulatory costs	<p>The NHVR agrees with the recommendation to continue with the existing methodology, which has to date been successful in calculating actual regulatory fees within a small variance of the NHVR budget.</p> <p>The NHVR would strongly recommend that the data used to calculate the charges be updated with current information to ensure the correct regulations fee is captured.</p>	Noted. The C-RIS used updated usage data to recalculate the regulatory component charges and these have been recalculated again as part of the D-RIS using the most up-to-date registration data and usage data.
ATA	17	PAYGO – recovery of regulatory costs	<p>The consultation RIS examines two options for adjusting regulatory charges throughout the life of the determination ... There is, however, a third option ... To maximise certainty for business and reduce administrative costs for governments:</p> <ul style="list-style-type: none"> ▪ regulatory charges should also follow a set trajectory throughout the period ▪ the NHVR's budget should be approved on a three yearly basis, not every year. Approving the NHVR's budget for three years at a time would give it more ability to implement its corporate plan and achieve effective, value for money results for industry, governments and the community. 	Noted. There are two reasons why the NTC cannot recommend setting the regulatory charges for three years in advance. First, the NHVR's budget is approved by ITMM on a yearly basis. Therefore, the NHVR budget for the second and third years is an estimate only, meaning that the regulatory portion of registration charge in the second and third years is subject to change. The other issue is that future fleet numbers are unknown and difficult to forecast, meaning that a predetermined price path will not necessarily recover the correct amount of revenue. To provide industry with a greater degree of predictability, the NTC recommends to publish forecast regulatory portions of registration charges on its website. It is likely that these forecast charges would be relatively accurate.
Bus Industry Confederation	17	PAYGO – recovery of regulatory costs	Yes, once proper cost causation is embedded in the cost allocation formula. Any such automatic adjustment should be limited to 5 years maximum, by which point cost drivers should be recalibrated.	Noted.
NatRoad	17	PAYGO – recovery of regulatory costs	And on the basis of the prior discussion our answer to Question 17 is no.	Noted.
NHVR	17	PAYGO – recovery of regulatory costs	Agreed. The current additional ministerial approval required before resetting the regulatory charges is an unnecessary extra step that creates additional administrative effort. Approval of the NHVR budget by ministers should be the automatic trigger to make any adjustment required.	Noted.

Bus Industry Confederation	18	Determ. opt. – heavy vehicle cost base and implications for full cost recovery	The bus industry has serious concerns about the change in the way ESA-kms have been handled – this has a big adverse impact on bus, for a cost attribution process that is subject to uncertainty, as shown by differences between Options B and C in terms of how they treat this matter, as compared to the current approach.	Noted (see response below).
NHVR	18	Determination options (general)	For reasons stated in the answer to Question 8, the NHVR recommends that the current and modified current options (Option A and Option B) are considered in this determination. It should not be assumed that Victoria’s road infrastructure is representative of all road infrastructure condition across the rest of Australia.	Noted.
Bus Industry Confederation	19	PAYGO – cost allocation	Sensitivity testing should be done on the ESA-km values, covering a wider range of allocations. For example, the Option C approach uses different values to the Option B approach, so there is no uniquely defensible set of numbers. Yet the NTC preferred approach, Option B, will hit bus harder than the Option C assumptions about ESA-km proportions. Sensitivity testing should explore this issue and proposed charges be re-considered in light of the findings. A thorough review of cost attribution factors is required on ESA-kms to reduce uncertainty.	Noted. While the percentage of ESA-km for expenditure category B2 is higher under option B than option C, overall buses would still pay much higher registration charges and RUC under option C than option B. As noted in section 4.7 and chapter 5, the choice of cost allocation approach is to some extent a matter of judgement, rather than pure economic or scientific analysis, but the HoustonKemp report considered that 70 per cent attributable costs for category B2 is reasonable.
ALC	20	PAYGO – cost allocation	<p>ALC has as its preference a road user charge calculated on a forward-looking cost base utilising the ‘building block’ approach proposed under the Heavy Vehicle Road Reform (HVRR) applicable for all classes of vehicle.</p> <p>At the end of the day, the framework for access to roads is more important than pricing mechanisms.</p> <p>Because the future of the HVRR is not certain, ALC believes that the PAYGO system should continue to operate on the current basis until such time as:</p> <ul style="list-style-type: none"> ▪ the HVRR has developed some form of road user charge mechanism capable of being considered by industry and governments; and ▪ there is a likelihood the jurisdictions will pick up the proposed model. <p>In that context, ALC believes there should be no real change to the current cost allocators and expenditure categories. However, if the PAYGO system looks like becoming</p>	Noted.

			permanent it may become appropriate to consider the utility of adopting the alternative cost allocators developed by the Victorian Department of Treasury and Finance that are based on allocators recommended by the Australian Road Research Board in its 2019 report.	
ARTC	20	PAYGO – cost allocation	<p>[Supports] The proposed change in the allocation methodology:</p> <ul style="list-style-type: none"> ▪ ARTC has been subject to extensive reviews by the ACCC of its pricing allocation decisions, a key focus of which has been to ensure that costs are allocated to cause and ideally based on detailed engineering assessments. This would support the use of the Victorian methodology for cost allocation as the most accurate available allocation methodology. ▪ The cost base reflected by this approach is stated to be \$4.84b; compared to the 2017 standalone cost base identified by HoustonKemp of \$7b. This cost remains considerably short of the standalone cost base, but does provide a positive move to a more average cost mechanism which would be more equitable (notwithstanding the HoustonKemp assessment understates the full cost impact due to the absence of costing externalities). ▪ ARTC therefore supports the use of the VIC DTF/DOT allocation mechanism. 	Noted.
ATA	20	Implementation options – multi-year price periods	<p>The determination should be implemented through a fixed three-year pricing period, with charges increasing 2 per cent in 2022–23, followed by a 3 per cent increase in each of 2023–24 and 2024–25.</p> <p>To maximise certainty for businesses during the determination period:</p> <ul style="list-style-type: none"> ▪ the NTC should publish the details of the road user and registration charges for each year of the determination period ▪ the Heavy Vehicle Charges Model Law should be amended to set registration charges for 2022–23, 2023–24 and 2024–25 ▪ the 2022 road user charge determination should set the road user charge for 2022–23, 2023–24 and 2024–25. <p>The heavy vehicle charges set under PAYGO should not be replaced with different FLCB charge rates during the three-year period of the determination.</p>	Noted.
Bus Industry Confederation	20	PAYGO – cost allocation	<p>Option B includes 7 of the adjustment factors noted in section 2.1, the most important of which for bus involves changing the way equivalent standard axle values are estimated for different vehicle classes and then applied to road expenditure categories. As applied, this sees a large increase in the ESA-km values for all five categories of bus, four of which involve around doubling current ESA values and the other (bus with 3 or more axles) involves more than quadrupling current ESA values (NTC 2021, Table 7).</p>	<p>While buses are subject to the largest increases of all heavy vehicle classes, this reflects (i) a significant increase in estimated ESAs based on the new data from PTT; and (ii) the choice of cost allocation approach. The increase under (i) will necessarily increase the costs allocated to buses on the</p>

			<p>This change in ESA values increases the level of costs that are allocated to buses from \$65m, under the current cost allocation approach, to \$132m (NTC 2021, Table 8), a much larger relative increase than is imposed on any other class of HV and accounting for a large proportion of the changes in total charge revenue (across all vehicle classes) recovered via ESA-km allocations. Light vehicles and rigid trucks do well out of this change in ESA values, with buses and articulated trucks being hit hard...</p> <p>In terms of answering specific questions asked by NTC, doubt about the most appropriate proportion of B2 costs to allocate on an ESA-km basis suggests avoiding unduly penalising any particular vehicle class by the specific value that is chosen, which is ultimately rubbery at present. The current NTC choice, of 70% of B2 costs allocated on an ESA-km basis, hits buses, in particular, very hard and should be rejected on this basis, or compensated in some way. Section 4.3 explores this issue in further detail. Choice of a preferred implementation pathway that relies on small annual increases in charge components for all vehicle classes is one effective way to handle this concern with cost allocation, as discussed later in this report.</p>	<p>basis of the updated usage data (suggesting that the costs allocated to buses were too low previously). Regarding (ii), the NTC considers that this allocation approach improves on the existing methodology for category B2.</p>
Bus Industry Confederation	20	PAYGO – cost allocation	<p>As with the preceding two options, the cost base increases once changes in traffic levels from the status quo are recognised, increasing the cost base for Option C to \$4,402m, which becomes the charging base for this Option. This option is currently only estimated from Victorian data, which should rule it out as a basis for the upcoming charges determination, even though NTC has (usefully) endeavoured to show how it might impact national charges. Importantly, however, Option C has a lower proportion of B2 costs allocated on an ESA-km basis than Option B, raising questions about the NTC cost allocation approach on this particular allocator (as embedded in Option B). Such doubts suggest that a major review of all cost allocation proportions should be a central part of the HVRR program over the next 2 years, for use in future charges determinations.</p>	Noted.
Bus Industry Confederation	20	PAYGO – cost allocation	<p>The modified cost base option (Option B), since most of the 7 changes it makes to the status quo approach seem defensible. However, this submission has frequently expressed concerns about how the ESA-km values and HV regulatory costs are allocated, in terms of how they impact bus charges. The whole cost allocation process should be reviewed as a matter of urgency, and particularly in relation to ESA-kms. Concerns about adverse impacts on a particular vehicle category (or categories) could be handled partly through the choice of the overall cost recovery rate that is pursued and choice of implementation pathway but ideally implementation pathways would not be used to cover over weaknesses or uncertainties in cost allocation methodologies, as they affect particular vehicle classes. Reducing uncertainties about valid cost attribution parameters is critical for confidence in the charging process, while use of registration charges is the best mechanism to manage concerns at individual vehicle category level.</p>	Noted (see previous responses).

NatRoad	20	PAYGO – cost allocation	Despite the NatRoad proposal providing a simple solution to the issue of the method of increase in heavy vehicle charges, we have, below, sought to answer the questions posed in the CRIS in order to assist the NTC. Before doing so we outline the NatRoad position regarding HVRR which will supersede any determination arising from the CRIS process. We note that the NTC indicates that the key question it would like to have answered is whether the current cost allocators should be changed. The NatRoad answer is, in general, 'no' for the short term. We would prefer the solution mentioned in paragraph 4 to prevail. In looking at the detailed answers to the NTC questions in the CRIS, we have reinforced that view with minor changes only endorsed. But the HVRR model must be different and based on entirely different premises, the predominant one being that all road users must pay for the costs of roads.	Noted.
NatRoad	20	Determination options – heavy vehicle cost base and implications for full cost recovery	The main issue that NatRoad highlights in consideration of these questions is that the CRIS notes: Given that the cost base under all options is significantly above the revenue currently provided by heavy vehicle charges, it is unlikely that full cost recovery of the heavy vehicle cost base could be achieved immediately in 2022–23 under any of the three options. NatRoad believes that using the status quo and increasing the cost base by a fixed percentage, as outlined in paragraph 4 of this submission, is the best model whilst the HVRR process is bedded down. Hence our answers are that the status quo should be used for this determination but that there should be a fixed percentage increase only passed on to the sector.	Noted.
NHVR	20	Determination options – heavy vehicle cost base and implications for full cost recovery	Option B, which identifies the cost allocation matrix to allocate 70 per cent of costs in expenditure using ESA-km as proposed in the HoustonKemp report – 'modified current', while noting the report suffers from a range of data and methodological issues, attempts to redress some of the imbalances of cost allocation under the other options. Option B perhaps best reflects the cost associated with road wear and tear, consequential with heavy vehicle movement and therefore the cost bases for consideration in calculating the determination.	Noted.
Philip Laird	20	PAYGO – cost allocation	On page 76 of the 2021 consultation regulation impact statement, it is noted Percentage of total expenditure allocated to heavy vehicles (%) with Status quo for 2020–21 heavy vehicle charges is just 22.5 per cent. Option A allows the Allocated heavy vehicle cost base to fall to 21.7 per cent. This should be rejected. Option B suggests 23.3 per cent and Option C has 25.5 per cent. It is of note that in New Zealand, road user charges that are mostly imposed on heavy vehicles on a mass distance basis amounted to about 45 per cent of the total revenue of their Land Transport fund ... A heavy six axle semitrailer in New Zealand pays \$NZ589	Mass distance charging falls outside the scope of this heavy vehicle charges determination. It may also be worth noting that the New Zealand system may not be directly comparable to Australia because Australia does not operate a land transport fund, and the nature of the network, expenditure levels and the configuration of the vehicle fleet are likely to be different.

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			per 1,000 km. This, at a conversion rate of \$A1 = NZ1.05) is about 56 cents per vehicle km. In Australia ... This works out at an average of 21.5 cents per vehicle km.	
Philip Laird	20	PAYGO – cost allocation	Together, for these two classes of articulated trucks, a case can be made that their operation is in receipt of hidden subsidies exceeding \$2.2 billion per year. Other classes of heavy trucks, where trucks are involved in hauling long distances each year, are also likely to be in receipt of hidden subsidies. With an estimated freight task for all articulated trucks of about 173 billion tonne km (ABS SMVU for 2019–20, there is an average deficit rate on road cost recovery from articulated freight vehicles of at least 1.25 cents per net tonne-km' These estimates do not include external costs of air pollution, noise, emissions and road congestion and road trauma, of a similar order.	The model's charges are set to avoid cross-subsidies (noting that the attributable cost will depend on the chosen cost allocation approach). In any case, charges have not been set based on the model for many years, and implementing even cost recovery of the current cost base is likely to be challenging, let alone materially increasing it. Externalities have not been part of the charging system to date and are not in scope for the determination.
ARTC	21	Other	Given the innovation and accelerated development occurring in respect of electric vehicles, the cost recovery mechanism implied within the PAYGO model of diesel excise has a limited life span before it will be unable to recover even the incremental costs of heavy vehicle usage. This will create a funding crisis for road managers and governments; as well as exacerbating the market failure already present in the freight market due to the under recovery of heavy vehicle costs imposed on the network and economy as a whole. ARTC therefore urges the NTC, as part of its recommendations to the Infrastructure Transport Ministers Meeting, to accelerate the process of HVRR to ensure the funding mechanisms reflect usage, and the inherent market failure the current funding mechanism drives is addressed.	Noted. While the NTC understands that electric heavy vehicles will become more important as time goes on (currently estimated at 0.03 per cent of the national heavy vehicle fleet), changes to the charging mechanisms are out of scope for this determination but is being considered under HVRR. HVRR is being led by the Commonwealth (in partnership with jurisdictions) and the pace of this reform will be determined by ministers' decisions.
Bus Industry Confederation	21	Implementation options (general)	There should also be an option that uses 2% annual charge increases, to widen the detailed choices available to Ministers. This may marginally reduce the rate of cost recovery, but the current economic circumstances are not suited to lifting cost recovery rates. The NTC report shows that HV revenues exceeded allocated costs for a few years prior to 2017–18 than fell short of these costs for some years. In other words, these things change over time, sometimes delivering a surplus, so there is no imperative to lift the cost-recovery rate at present, when industry is under pressure, such as the touring bus sector, which has been severely impacted by COVID.	Noted.
NatRoad	21	Implementation options (general)	Moving to a better measure of cost recovery for all road users should form part of the HVRR process.	Noted.

NHVR	21	Implementation options (general)	The NTC has offered a comprehensive review of various implementation options. The adoption of any of the implementation options will depend on the risk appetite of ITMM in managing industry expectations in a COVID-19 environment. Each implementation option offers its own risks and benefits in pursuing the principles and methods that ensure the delivery of full cost recovery in aggregate. The NTC has presented several indexation adjustment arrangements to ensure the ongoing delivery of full expenditure recovery, and recognises the transition to any new arrangement may require a phased approach.	Noted.
Bus Industry Confederation	22	Pricing principles	<p>It is important to understand that these pricing principles hint at the need to take account of some external benefits and costs, in particular congestion and impacts on regional and remote communities, the latter being referenced under equity. However, the NTC focus is primarily on heavy vehicle (HV) charging being about recovery of allocated expenditures. Surprisingly, congestion does not seem to get a mention by the NTC in the development of its charging options, even though it is specifically mentioned in the principles. Matters such as mobility-related social inclusion, an increasing concern in outer urban and regional areas and an important equity issue, is also not considered in the report, other than indirectly through the rural and remote lens. However, that spatial setting is essentially about costs of servicing regional and remote communities for freight, rather than personal mobility for social inclusion. The principles thus encourage a focus on equity for freight services to particular communities but ignore equity in terms of person movement.</p> <p>The neglect of externalities and social inclusion in the NTC deliberations means that the resulting set of charges cannot be called economically efficient: all that can be said of them is that they will recover all, or most, of road construction, maintenance, regulatory and related costs that have been allocated to heavy vehicles. With externalities being of increasing magnitude in the transport sector, particularly in urban areas (e.g. Stanley and Hensher 2011), it is time that charging principles recognised their importance and ministers directed the NTC to take them into account in charge setting. As shown in section 3, this is important for the bus sector, where market failures (particularly externalities and social inclusion) are a primary reason for many services. This contrasts with the truck sector, where commercial principles are the basis of function and externalities are more about getting safety standards and emissions standards properly set. There are mechanisms in place to achieve the latter adjustments, albeit that they often lag international best practice (e.g. air quality and related vehicular emissions).</p>	Noted. Changing the current charging mechanism to reflect externalities is out of scope for the current determination. Also, given the localised nature of many externalities (e.g. fine particles, congestion) trying to manage the externality through a national charge that applies regardless of location would not be appropriate.
Bus Industry Confederation	22	Pricing principles	If the core pricing principles under which the NTC is required to frame its determination are accepted, the choice of a preferred approach between these three options is largely a matter of deciding which option best reflects the way heavy vehicles impact road expenditure levels and which is likely to be most politically palatable, recognising some of the matters flagged in the pricing principles.	Noted.

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Bus Industry Confederation	22	Pricing principles	<p>A pricing floor can be set, given the NTC’s pricing principles, by attributable costs. If some vehicle classes were priced on this basis, then charges on others would need to increase to achieve a given cost recovery target, unless a reduction in the overall cost recovery rate was acceptable. Table 1 showed that apparent under-recovery for bus can be linked to the level of non-attributable costs, estimated at \$66.7m under Option B (setting to one side here concerns about ESA-kms in cost attribution and their effect on bus costs). Within a total cost base of \$4,018m, this level of non-attributable costs is trifling, accounting for only 1.7% of total costs. Hence, pricing bus at attributable costs, as might be warranted because of its external benefits (as discussed in section 4.3) would have very little impact on charges for other HV classes, within a given cost recovery target.</p> <p>It should be reiterated that the apparent level of under-recovery from bus is heavily influenced by the way ESA-kms are handled in the cost allocation process, which is contestable. Detailed review of that cost allocation process, and of the way regulatory costs are distributed, both seem likely to reduce costs that are recoverable from bus...</p> <p>... Table 4 suggests that, of the \$222m costs attributed to bus, \$179m are associated with ESA-kms, of which \$150m are costs allocated to 2-axle buses > 10 tonnes (\$150 million). Getting the attribution factors right for this cost driver is critical for bus charging, particularly for the 2-axle buses on which route and school bus services rely. Economically efficient pricing requires that cost allocation is got right, so a detailed review of cost allocation processes should be an early priority, particularly as this impacts bus charges. Importantly, Table 1 suggests that 2-axle buses are paying \$46m less than their allocated costs, which Table 4 suggests is the level of their non-attributable costs. In short, they are paying their attributable costs, even on the ESA-km allocation basis that hits bus hard. The same conclusion applies to 3-axle buses.</p>	<p>Noted. Most categories of buses have charges set to recover attributable costs (the minimum necessary increases) under the direct implementation option, given the technical changes proposed in the C-RIS. Regulatory costs are set separately and are not part of the attributable or the non-attributable (common) costs.</p>
Bus Industry Confederation	22	Pricing principles	<p>The pricing principles set out in section 2 are primarily about financial cost recovery of HV road related expenditures, subject to concerns about economically efficient charges for road use by heavy vehicles. Economically efficient charges would take account of road expenditures that are attributable to heavy vehicles, as identified by NTC (particularly the modified cost base option) but should also consider any external costs and benefits associated with road use by particular classes of HVs. There are two issues here: first, what is the size of any such external benefits; secondly, should these external benefits be reflected in HV road charges or are they better recognised some other way, such as through fare setting where public transport is involved.</p> <p>Taking urban bus as an example, Stanley and Hensher (2011) estimated the following external benefits from Melbourne’s route bus services (in 2010 prices) ... \$1,408 MILLION ... Given that there were about one million bus trips at the time, this amounts to about \$14 external benefit per bus trip. While social inclusion benefits account for just over half this benefit, congestion cost savings (from getting people out of their cars), environmental</p>	<p>Noted.</p>

			<p>benefits and accident benefits were worth a substantial \$6.24 per bus trip (in 2010 prices). This could be increased to around \$8 per trip in 2020 values for the latter three benefits, or \$18 per trip if social inclusion benefits are added, as they should be for bus (this is the major societal benefit of route buses)...</p> <p>... Increasing road use charges on route services is likely to lead to a small reduction in service levels, if governments decided to pass on these cost increases through higher fares (given pressures on state government budgets from which the net costs of such services are usually met). Any such fare increases would create an associated loss of external benefits. For example, implementation of the direct implementation price pathway has been estimated to increase total bus operating costs per bus by 1.08 percentage points ... The external benefits forgone would amount to around \$6 million annually in Melbourne alone (or probably around \$30 million nationally) ...</p> <p>... The loss of external benefits that would accompany higher road use charges, if state and territory governments chose to increase fares to meet the higher charges, is an argument in favour of bus charge increases being a little less than for other vehicle classes, unless they too can demonstrate external benefits from operation. This will generally be difficult, since trucking operations are essentially commercial, with external costs such as congestion costs, greenhouse gas emissions and air pollution the most likely externalities, in this case all being external costs rather than benefits. Road-based public transport is in a different situation, its rationale being in large part about providing external benefits, by correcting market failures associated with the external costs of motor vehicle use and delivering the merit good value of social inclusion (Stanley and Stanley 2021). As a matter of general pricing principles, it can be argued that external benefits from public transport operation should be taken into account in the fare setting process, as IPART seeks to do in NSW, rather than through the way that charges are set for road use. However, when increased road user charges are likely to lead to a reduction in the external benefits flowing from bus operation, as is to be expected at least to some degree, then this seems likely to distort efficient resource allocation across the HV sector, because the trucking sector is very highly unlikely to be able to point to similar external benefits (external costs are more likely in the case of trucking).</p>	
Bus Industry Confederation	22	Implementation options (general)	<p>The assessment is quite comprehensive but does not identify how severely the bus sector, and particularly the hard-working route/school bus and charter/touring sectors, will be affected by the changes in the cost allocation approach. This is a serious equity and efficiency issue (e.g. bus produces many external benefits, some of which will be lost if the charges that are set out proceed). Given constraints on available charging instruments (there are only two), then changes to implementation pathways are one way to help mitigate such concentrated inequitable impacts but, as noted above, revised registration charges are probably a preferable option, having the benefit of being vehicle-class specific.</p>	Noted (see previous responses).

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NatRoad	22	Implementation options (general)	<p>We agree with the observation in the CRIS that: Example 1 of the three-year fixed price path implementation approach (3.5 per cent increase per annum) would minimise the impact on industry and makes some progress towards increasing heavy vehicle charges in line with the recent average yearly growth in the heavy vehicle cost base. While it is unlikely to fully comply with the cost recovery mandate provided by the pricing principles, it scores highly in terms of considering the impact on industry and regional and remote communities.</p> <p>Question 22 is not relevant having regard to our answer to Questions 21 and 24.</p>	Noted.
NHVR	22	Implementation options – financial and fiscal implications	<p>The NHVR notes that cost recovery over time in an efficient and equitable manner remains the goal of the determination. We support any funding commitment derived from the determination that will help improve heavy vehicle safety and productivity outcomes through focused government investments.</p> <p>Of particular importance for the NHVR is ensuring that the determination and the resultant registration fees has a positive impact on the uptake of safer and more productive heavy vehicles, and continuing to ensure the NHVR has the necessary funding to undertake its critical role in ensuring heavy vehicle safety outcomes are achieved.</p> <p>We know matching of revenue to expense is difficult and determining heavy vehicle charges is a complex problem for governments and industry.</p>	Noted.
NHVR	22	Implementation objectives	<p>The NTC has canvassed a range of implementation options identifying cost impact to industry. Finding the right balance in managing this complex issue is challenging given all the variabilities that need to be considered.</p>	Noted.
ALC	23	Impl. opt. – multi-year price periods	<p>There is also scope to consider striking road user charge rates for multiple years so as to remove the ‘lumpiness’ of the RUC and so make investment and pricing decisions easier for heavy vehicle operators.</p>	Noted. The NTC is recommending that heavy vehicle charges be set for a three-year period from 2022–23 to 2024–25.
ASBFEO	23	Implementation options – impact on industry	<p>We support the move away from the current practice of revisiting heavy vehicle charges each year to a multi-year price path. Small businesses suffer from cumulative regulatory burden and as flagged in the C-RIS a multi-year approach should reduce administrative and compliance costs for small businesses that operate heavy vehicles.</p> <p>We share the concerns canvassed in the document that to move immediately to the full recovery of allocated infrastructure costs would impose ‘an unreasonable burden’ on heavy vehicle operators and not give them time to incorporate the cost rise into contracts. This is particularly so with small business operators of heavy vehicles who may decide to absorb some or all of the increase so as to remain competitive. Now is not the time for abrupt increases in charges to small businesses, with the prospect of uncertain economic</p>	Noted.

			<p>times in the short to medium term. In light of this, we would encourage a more gradual approach be adopted.</p> <p>We therefore are of the view that small businesses would be better able to accommodate these price increases were they in the form of a defined multi-year price path that incorporates smoothed price rises rather than an initial jump.</p>	
ATA	23	Implementation options – impact on industry	<p>... the 16.5 per cent headline increase in the cost base under the direct implementation option masks a 22 per cent increase in the road user charge and very large increases in some registration charges.</p> <p>The NTC notes that the economic consequences of a significant increase in heavy vehicle charges may be more severe than usual, and that heavy vehicle operators may not be able to pass on significant increases in heavy vehicle charges. The ATA agrees with the NTC's assessment, although the consequences of a 16.5 per cent increase in heavy vehicle charges would be severe at any time. In our 2021 truck charges survey, we asked participants about their ability to pass on registration charges and changes in the fuel price (including changes in fuel tax credits). Overall:</p> <ul style="list-style-type: none"> ▪ 16 per cent of the businesses we surveyed could pass on registration charges ▪ 34 per cent could pass on fuel price changes and ▪ 13 per cent were able to pass on both registration and fuel price changes. <p>... In the qualitative section of the survey, small trucking businesses shared their difficulties with passing on costs ... Larger businesses told us they had more ability to pass on costs, but that the market was still very difficult</p>	Noted.
Bus Industry Confederation	23	Implementation options – impact on industry	<p>Table 1 suggests that only one class of bus would more than pay its way under this charging and cost allocation arrangement (2-axles: 4–5 to 10 tonnes, where the 'Difference column' in Table 1 shows a positive figure), if the cost allocation assumptions behind the NTC's modelling are accepted. Under-recovery is assessed as greatest for 2-axle buses (> 10 tonnes), at nearly \$46 million, with most school and route buses being in this class. The gap is assessed at just under \$5 million for 3-axle buses. Overall, direct implementation of Option B suggests that buses would under-recover their allocated costs by \$55.8m annually. Given that the overall model is designed to break-even, then the under-recovery on bus needs to be offset by over-recovery on other vehicles for a given rate of break-even to be achieved.</p> <p>This estimated level of under-recovery from bus is not mentioned by NTC (2021) but it is important that bus recognises it is implicit in the analysis. Importantly, the aggregate level of apparent under-recovery from bus, of \$55.8m, is less than the increase in bus-attributable costs that flow from changes in the way ESA-kms are allocated across vehicle</p>	<p>This analysis should not include the class of bus from 3.5 to 4.5 tonnes as this is not a heavy vehicle and does not form part of charges determined under PAYGO.</p> <p>The model is designed to achieve recovery of allocated costs in total from heavy vehicles, and for each vehicle class to recover at least its attributable costs (meaning the statement in the last paragraph is achieved by design). If some vehicle classes recover less than their allocated costs, other vehicle classes will necessarily have to contribute more than their allocated costs to achieve overall recovery of the heavy vehicle cost base.</p>

		<p>classes. As noted, this adds \$65m to costs allocated to bus. Also, choice of more causal cost drivers for the regulatory component of registration costs would be expected to reduce the total level of costs that are recoverable from bus.</p> <p>Table 1 also sets out non-attributable costs, which sum to \$66.7m for bus, as derived from the NTC spreadsheet. This represents 23.0% of total allocated bus costs, a higher proportion than for other HVs (19.5%). Allocation of the non-attributable costs is not a scientific process. If the bus share of these costs was the same as other HVs, then the level of bus costs would reduce by \$10.2 million, under-recovery reducing by the same amount.</p> <p>Importantly, given the NTC modelling assumptions, some of which have been queried above, Table 1 shows that, for direct implementation of Option B, bus more than recovers all its attributable costs (total minus non-attributable costs), showing a surplus of \$10.9m on this basis (i.e. \$289.8m – \$66.7m > \$234.0m by \$10.9m).</p>	<p>The NTC did not assess whether particular segments of the fleet under- or over-recovered their allocated costs. Rather, charges were initially set using existing charging relativities, scaled to recover the total heavy vehicle cost base, with some vehicle classes then needing to increase by more than the standard amount to ensure recovery of at least their attributable costs.</p> <p>Non-attributable costs are allocated on the basis of VKT. As a result, vehicles that travel further will be allocated more of these costs. If buses do bear a higher share of these costs than other types of vehicles, this simply reflects longer average distances travelled.</p>
Bus Industry Confederation	23 Implementation options – impact on industry	<p>Road user charges (collected through fuel excise) associated with the NTC current cost allocation Option (Option A) are set out in Table 2, showing how the RUC varies with the different implementation pathways. The increase in RUC from 26.4 c/L to 32.2 c/L associated with the direct implementation pathway is a huge increase (22.0%). It raises doubts that politicians would agree to one-off charge increases at this scale, given the shock it imposes on business costs. RUCs for the other two implementation pathways are also shown in Table 2. Sustained increases of 6% annually for three years are also very high, relative to normal benchmarks such as CPI and increases in average weekly earnings (typically at 2% p.a. or less at present). It is reasonable to conclude that the 6% implementation pathway will not be politically acceptable. This leaves the 3.5% pathway as the most likely surviving implementation option, although percentages below or (less likely) a little above this rate may currently be appealing to politicians.</p> <p>All heavy vehicles would pay the same RUC (c/L), the amount depending on fleet fuel efficiency. Hybrid and electric buses would get an advantage, because the NTC has not proposed road user charges equivalent to the RUC for these vehicles (other than for the fuel used by hybrids). The NTC has considerably underestimated the number of electric and hybrid buses currently in operation,³ so operators who have those vehicles will get a small benefit from the proposed charging regime, via their zero or low fuel use, but numbers remain small.</p> <p>Proposed registration charges will impact many bus owners/operators very substantially... Reflecting the data in Table 2, which shows that the lightest end of the bus sector more than pays its way, the direct implementation model involves a small reduction in registration charges for 2-axle buses of up to 12 tonnes (but they would still pay the considerably higher RUC for this option, if adopted). However, 2-axle buses > 12 tonnes</p>	<p>The NTC acknowledges that buses are the vehicle classes with the highest impacts. As noted by the BIC, this is largely driven by the increases to bus ESAs and the recommended change to cost allocation, along with the need to avoid cross-subsidisation by ensuring each vehicle class recovers at least its attributable costs. The updated ESA data shows that buses are heavier than previously thought, meaning they are causing more road wear and, as a result, charges would need to increase to ensure recovery of at least attributable costs (as required by the pricing principles, to avoid cross-subsidisation) under the direct implementation option. The NTC acknowledges the impact that direct implementation would have on operators and this is reflected in the development of alternative options with more moderate impacts across the industry. The NTC considers that the charges for buses under the recommended three-year price path are reasonable both in total, and in a relative</p>

			<p>GVM, which includes most route and school buses, would incur a huge increase in registration charges (and in the RUC) under the direct implementation approach, increasing from \$651 to \$2,606, which is a quadrupling of the charge. No other vehicle class has a rate of increase in its proposed charges of anything like this scale, a result which flows from changes in the ESA values within the cost allocation process (as explained in section 2.2). Registration charges for 3-axle buses, commonly used in the tour and charter sector, would increase by over 175% (i.e. almost trebling), the second fastest rate of increase of any vehicle class shown by NTC. If direct implementation was thought to be a political possibility, then rebuttals of these huge rates of increase are required. However, as argued above, the high rate of increase in the RUC under direct implementation should rule this pathway out in terms of political acceptability.</p>	<p>sense when compared with other heavy vehicle types.</p>
Bus Industry Confederation	23	Implementation options – impact on industry	<p>The other two implementation pathways necessarily deliver much smaller increases in registration charges for buses but the proposed increases for 2-axle buses > 12 tonnes and 3-axle buses in both of these pathways are faster than the overall rate of increase in each pathway, particularly for 2-axle buses > 12 tonnes GVM in year 1 for the 3.5% p.a. pathway. In this pathway the proposed year 1 increase is 5.7%, falling to < 3% annual increase in the second and third years. It is hard to understand the reasoning, if any, behind this changing rate of annual registration charge growth over the three years, other than as an attempt to strike early in terms of narrowing what the NTC sees as the revenue/expenditure gap for this vehicle class. The increases proposed for 3-axle buses under the 3.5% p.a. pathway are more even across the three years but larger than 3.5% in each.</p> <p>For the 6% annual charge growth pathway, 2-axle buses > 12 tonnes again are hit hardest in year 1 but less so thereafter, whereas the proposed increases for 3-axle buses are 6% or more each year, reaching 20% higher than current charges by year 3. Given the stresses that the tourism sector has been under during COVID, price penalties of this magnitude would be seen as particularly burdensome. This adds to the reasons for rejecting this pathway.</p>	<p>The variation in the rates of annual increase to total registration charges reflect the NTC's modelling assumption to hold the regulatory component charges constant in years 2 and 3, given the unknown future NHVR budget and heavy vehicle fleet in these years. The percentage increase in the roads component of registration charges is the same throughout the three-year period in the C-RIS.</p>
Bus Industry Confederation	23	Implementation options – impact on industry	<p>Some simple calculations can show the scale of the increase in road charges for 2-axle buses > 12 tonnes, the workhorses of urban route services and school bus services, under the three implementation pathways, using Melbourne average route bus data to demonstrate the results. Melbourne data suggests that a route bus averages 58,000 kilometres annually at a fuel economy rate of 42.2L/100 kms. With the RUC at the current 26.4c/L and registration charges of \$651, total annual road charge payments of \$7113 per vehicle p.a. result.</p> <p>In year 1 of the direct implementation pathway, when the RUC increases to 32.2c/L and the registration charge to \$2606, the total charge payments increase to \$10,487, an increase of \$3375, or +47.4% in one year, over half of which comes from increased</p>	<p>Noted.</p>

			<p>registration charges. This is a huge increase, not identified in NTC (2021) and likely to have little appeal to political decision-makers, once confronted with the numbers. We examine impacts here for a typical urban route bus. With average operator costs per route bus kilometre of ~\$5.40 and 58,000 annual average kilometres run, road charges amount to 2.27% of total bus operating costs under current charges. However, this would increase to 3.31% of (higher) total operating costs under direct implementation. The increase in total costs per bus would add 1.08% to total bus costs. Under state route bus service contracts, all this cost increase (of \$3375 per vehicle) would typically fall on state budgets.</p> <p>This scale of charge increase should be sufficient to rule out direct implementation as a politically acceptable alternative for the bus sector. Given the rate of increase in the RUC paid by all HVs implied by this implementation pathway (22%, as noted above), political unacceptability should be the case for all HV classes.</p>	
Bus Industry Confederation	23	Implementation options – impact on industry	<p>It was argued above that the third implementation pathway, which involves 6% annual charge increases, is also likely to find little political interest in the current COVID environment. The touring sector of the bus industry would be particularly hard hit, as it tries to recover from COVID.</p> <p>For 2-axle route buses > 12 tonnes, the average charges paid in year 3 under the 6% pathway would be \$8,458, some 18.9% higher than current annual payments. This high rate of increase would help to narrow the gap between overall HV revenues and allocated costs, but it is high in the current economic climate, and one must ask why you would penalize a sector that generates so many positive external benefits, as discussed in section 4.4, with this increased burden. Also, given that the HV sector over-recovered on its allocated costs for several years prior to 2017–18, there is arguably no urgency to close the gap for the sector as a whole, including bus, at least until such time as the economy has stabilised post COVID. The 6% implementation pathway deserves no further attention.</p>	Noted.
Bus Industry Confederation	23	Implementation options – impact on industry	<p>This leaves the 3.5% annual increase implementation pathway as the only one likely to be politically palatable, or some other (currently unspecified) variant thereof, that probably involves smaller annual rates of charge increase. As noted above, the 3.5% rate of increase was chosen by NTC on the basis that it keeps overall HV cost recovery at around its current level, in a context of increasing aggregate HV road-related expenditures that need to be recovered – hence the need for some increase in charges. For a typical 2-axle metro route bus, the annual charges paid in year 3 under this pathway would be \$7,893, which is 11.0% higher than current charges. This is a lot better than the 47.4% increase in year 1 under the direct implementation pathway but is still a substantial increase in charge levels. The impact of the decision to increase the cost allocation component that is based on ESAs remains a major influence here, with the added nuisance of an unwarrantedly high regulatory charge component of the registration</p>	Noted.

			<p>charge.</p> <p>The 3.5% annual increase implementation pathway is the preferred option over the direct implementation pathway and 6% annual increase pathway. However, with many other major price indices growing more slowly, such as CPI (+1.57% p.a. for Australia between December 2015 and December 2020) and average weekly earnings (+2.25% p.a. for persons/earnings from November 2015 to November 2020), there are grounds for a charging alternative that is pitched at around 2% p.a. annual rate of increase over the three-year charge period. This would lead to an increase of \$435 over current charges for 2-axle buses > 12 tonnes in urban route service. Over the three-year charge period, a full review of the charging regime should be undertaken, including cost allocation, as part of the HVRR program.</p> <p>Cost increases from the three charge pathways for 3-axle buses are much bigger than those for the 2-axle metro route buses > 12 tonnes in absolute dollar terms, largely because of the RUCs (fuel charges) paid by the 3-axle buses, which travel much longer distances per year than urban route buses. To illustrate this, the BAN assumes that a 3-axle bus operates for 500,000 kilometres per year, providing a long-distance public transport service, with a fuel economy rate of 31.8L/100kms. In that case, the direct implementation pathway would increase total road charges for the 3-axle bus by around \$14,106 over current charges in year 1, much larger than the increase of \$3375 estimated for 2-axle metro route buses > 12 tonnes. About two-thirds of the increased costs for 3-axle buses come via RUC payments, given the long distances travelled, but registration charges also increase substantially (by \$4,884). The 6% pathway would increase 3-axle bus costs by \$8,660 in year 3, compared to current charges, while the 3.5% pathway still adds a substantial \$4,966 in year 3 to the costs of this 3-axle bus. Reducing the rate of charge increase to 2% p.a. would mean that a 3-axle bus doing 500,000 kms a year would pay an extra \$2,736 in year 3, mainly through higher RUC payments.</p>	
Bus Industry Confederation	23	Implementation options (general)	There are some examples discussed in this submission that precedes the answers to these questions. The BAN also notes that, if registration charges are reduced on one or more vehicle classes (as we propose for bus) then state revenues will reduce. This should not be a serious issue, since electrification of the vehicle fleet in coming years will be far more disruptive of governmental transport revenue flows.	Noted.
Motor Trade Association SA/NT	23	Implementation options – impact on industry	<p>The NTC has correctly identified the direct implementation option would cause significant cost increases to certain classes of heavy vehicles. As the ESA values for bus classes have either doubled or tripled these represent a major adjustment to the respective cost allocation.</p> <p>Combined with the full cost recovery under the direct implementation option this would impact three axle buses – i.e. coaches – with a registration cost increase from \$2,731 to</p>	Noted.

			\$7,615 and dual axis busses over 12 tonnes from \$651 to \$2,606. The MTA represents members who operate vehicles in these classes and have been experiencing major business disruptions caused by the impact of COVID-19 pandemic. The impost caused by option one on these members would be significant. Implementation options 2 and 3 are a better compromise between cost recovery of infrastructure allocations and spreading out the impact over time to achieve cost recovery as per the pricing principals.	
Motor Trade Association SA/NT	23	Implementation options – impact on industry	The preferred option is implementation option 2 with the cost increases fixed at 3.5% per annum. This provides the lowest implementation, especially to a passenger transport sector, greatly impacted by the impacts of the COVID pandemic. Options that impose a huge sudden increase to individual classes are not supported and need to be avoided.	Noted.
NatRoad	23	Implementation options – impact on industry	As noted in the C-RIS, predictability of changes to heavy vehicle charges is important to permit operators to plan and reflect cost changes in their pricing and contracts (with the caveat that many smaller operators do not have the ability to pass on these costs).	Noted.
NatRoad	23	Implementation options – impact on industry	As indicated earlier, implementing a significant increase in heavy vehicle charges of even the smallest magnitude would be more severe than would otherwise be the case given the current uncertain economic climate and the ongoing impact of the pandemic ... In response to Question 23, we believe that the NTC should assist to move to a new model for HVRR that does not rely on PAYGO, given its defects. Plus work needs to be done on reforming the tax base, especially in relation to the fuel tax excise.	Noted.
NHVR	23	Impl. opt. – multi-year price periods	The three-year fixed path specifying fixed percentage increases in overall heavy vehicle charges is likely to be the most preferred method with industry.	Noted.
Philip Laird	23	Implementation objectives	The current system for road pricing was put in place in 1992 when it was found wanting by the Industry (now Productivity) Commission in its 1991–92 Annual Report, p 197–198): ‘The result is that some vehicles – the heaviest travelling long annual distances – will meet less than 20 per cent of their attributed costs. ... Differences between the recommended charges and road related costs are greatest for vehicles competing with rail. The charges, as recommended, will therefore potentially distort the long-haul freight market as rail reforms take effect ...’ On the other hand, there are claims that the NTC charges as approved by ministers, amount, in most years (but not all years) to full cost recovery. The process used for determining and approving these charges has problems. These	Noted. Mode neutrality is not in scope for this determination, and is not covered by pricing principles. However, there is an argument that achieving full cost recovery of the identified heavy vehicle cost base would be non-distortionary between modes at the national network level. Cost allocation has been re-evaluated since those previous reviews. The NTC has always put forward an option for setting heavy vehicle charges that would achieve full cost recovery to ministers; however, in recent years implementation

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			<p>were brought to light c2005 when ministers declined to implement a benign determination of the NTC in the face of industry pressure (as noted by the Australian Financial Review). It is submitted that the long standing NTC determined charges, coupled with ongoing relaxation of mass and dimension limits, has distorted the long-haul land freight market and, that these charges do not assist coastal shipping.</p> <p>In 2006, the Productivity Commission in its report Road and Rail Freight Infrastructure Pricing found the NTC methodology for allocation of road system costs to heavy trucks as 'conservative'.</p>	decisions have not achieved cost recovery (with instances of both over-recovery and under-recovery).
Philip Laird	23	Determination options – economic considerations	<p>In addition, since 2015 there has been further relaxation of mass and dimension limits. The very least that could be done, when such concessions are approved by the authorities, is that mass distance pricing at a full road cost recovery level could be a precondition, with the additional revenue going to maintain and upgrade roads. Put another way, the productivity gains should be shared with local government and the road agencies.</p>	Noted, but issues of the charging mechanism and hypothecation fall outside the scope of this heavy vehicle charges determination.
VTA	23	Implementation options – impact on industry	<p>The VTA maintains that there should be no changes made to the cost allocation matrix to the PAYGO model contained in the 'Consultation Regulation Impact Statement' for implementation in 2022–23. The VTA proposes that the implementation of the increased PAYGO costs should allow the transition to full cost recovery at a measured pace as a direct implementation approach would immediately impose an unreasonable burden on heavy vehicle operators. The VTA maintains that these increases should not exceed CPI for the defined periods.</p> <p>There is a fundamental assumption which needs to be highlighted when applying these proposed increases to the PAYGO model. Governments and government agencies assume that in order to achieve full cost recovery, it is a matter of heavy vehicle operators passing on these increase costs to their customers and through their contractual arrangements.</p> <p>In reality this is not the case as the imposition for the PAYGO model and its complexities to be communicated to customers is extremely difficult and operators are unable to pass on these increased charges. As stated earlier, we wish to highlight that heavy vehicle operators pay a disproportionate share of the costs.</p>	Noted.
ALRTA	24	Implementation options – multi-year price periods	<p>ALRTA strongly supports the adoption of a three-year pricing path. This will give greater certainty to road transport operators and government alike ...</p> <p>... ALRTA member operators are similarly mindful of the market's current ability to absorb price increases. After a significant period of unforeseen disasters including drought, fire, floods and disease pandemic, there are many customers unable or unwilling to absorb</p>	Noted. The NTC is recommending that heavy vehicle charges be set for a three-year period from 2022–23 to 2024–25.

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			<p>increases above CPI. At this stage, the focus of governments should be on supporting an economic recovery. Increasing charges on road transport will have a general negative impact on the cost of producing most goods and services in Australia.</p> <p>It is also important to consider the increased regulatory burden currently placed on the road transport sector arising via strict internal border crossing restrictions. Road transport businesses must develop and apply COVID Safe plans, invest in PPE, apply additional training/oversight, and modify otherwise efficient transport operations to comply with the rules. At a driver level, there is untold additional cost and time associated with regularly attending COVID testing clinics, applying for border crossing permits, queueing at border crossings, driving additional distances to testing locations or spending unproductive time waiting for test results to be returned.</p> <p>For these reasons, ALRTA recommends that charging increases should be lower than the minimum 3.5 per cent annual increases suggested by NTC. However, ALRTA also acknowledges the increase in road infrastructure investment occurring in rural and regional areas. On this basis, ALRTA is prepared to consider a larger charging increase than those proposed by ATA. In our view, a reasonable price path over the next three years is as follows: 2.5 per cent, 3.0 per cent and 3.0 per cent.</p>	
ARTC	24	Implementation options (general)	<p>[Supports] The 3-year price path implementation; provided that the commitment to impose this price path in future years is not subject to reverse by political decision and the price path is implemented in full. This is critical as the political decisions to limit the full recovery of the (limited) cost base that currently applies has contributed to excess consumption of the road network and the freight transport market failure that has resulted.</p>	Noted.
ATA	24	Implementation options – multi-year price periods	<p>The ATA has long argued that heavy vehicle charges should be set over a fixed, multi-year determination period, with the NTC able to determine a smooth path for charges throughout each period ...</p> <p>... Although the ATA has previously argued for a five-year determination period, we consider a three-year period workable. The ATA does not, however, agree with the NTC's argument that—</p> <p>The heavy vehicle charges set under this methodology could be replaced at any time with charges set under a new methodology introduced as part of HVRP.</p> <p>The point of having a fixed pricing period is to deliver a smooth, certain path for heavy vehicle charges. Setting charges under a new methodology – unless the new charges for remainder of the pricing period matched the old PAYGO charges – would not deliver this outcome.</p> <p>Based on the RBA's August 2021 output growth and inflation forecast, a reasonable</p>	Noted.

			pricing path would be a 2 per cent increase in 2022–23, followed by a 3 per cent increase in each of 2023–24 and 2024–25.	
ATA	24	Implementation options – multi-year price periods	<p>One of the goals of moving to a fixed multi-year pricing period is that it would provide industry with information about future heavy vehicle charges so they could plan with certainty. Businesses cannot use information about future charges unless they can find it.</p> <p>In the ATA’s view, the NTC should restructure the heavy vehicle charges information on its website to provide authoritative information about the charges that are to apply in each year of the determination.</p> <p>It would also be desirable for the legal instruments determining the charges to cover the whole of the determination and not just a single year. Accordingly, the ATA considers that the Heavy Vehicle Charges Model Law should be amended to set registration charges for whole of the three-year determination period.</p> <p>Similarly, the 2022 road user charge determination should set the road user charge for 2022–23, 2023–24 and 2024–25 and not just a single year. The ATA is satisfied that a three-year determination would meet the requirements of sections 43-10(9)-(12) of the <i>Fuel Tax Act 2006</i> (Cth). The ATA’s legal advice is attached.</p>	Noted. The NTC will endeavour to embed both RUC and the roads component of registration charges in the regulatory instruments for a three-year period. We will also review the way heavy vehicle charges are presented on our website as part of implementing any new charges approved by ITMM with a view to make the information as useful to heavy vehicle operators as possible.
Bus Industry Confederation	24	Implementation options (general)	<p>The bus industry preference is for a new implementation option, Option D, which has 2% annual charge increases. The industry also proposes a review of the registration charges proposed for bus, designed to at least cover attributable costs. The reasons for this approach/preference are set out in detail in this submission. In summary, section 4.4 puts the case this way:</p> <p>Recognising:</p> <ul style="list-style-type: none"> ▪ the substantial charging impact on bus, particularly 2-axle buses > 12 tonnes and 3-axle buses, arising from changes in the way ESA-kms have been used in the cost allocation process, and uncertainties about the accuracy of the ESA-km allocation process; ▪ questions about the way regulatory costs are allocated through the registration charge; ▪ the societal external benefits that are associated with bus use and likely loss of external benefits if bus charges increase substantially; and ▪ acknowledging that bus understands the importance of covering at least its (accurately estimated) attributable costs, the bus industry requests that NTC find a way to mitigate the impact of its cost allocation decisions on the bus sector, which will be hit hard by those decisions. The following specific actions are proposed. <p>1. There should be an urgent review of the cost allocation procedures used as a</p>	Noted. However, the pricing principles do not specifically reference societal external benefits, while avoidance of cross-subsidisation is an important pricing principle to adhere to under the direct implementation option. The increase in costs to buses largely reflects the new estimates of AGM and ESA values for buses as part of this determination, which is further increased by changes in cost allocation under option B. The two other implementation options are proposed as alternatives, recognising the impacts on industry under direct implementation.

			<p>contributor to the HV charging process, particularly in relation to ESA-kms.</p> <p>2. NTC should examine the implications of a 3-year 2% p.a. implementation pathway which would become Option D, this being the bus industry's preferred pathway. This rate of charge would apply to all vehicles and would mean a slight step backwards in the rate of overall cost recovery achieved, as compared to the current NTC options. However, as noted in section 2.3, HV charges sometimes under-recover allocated expenditures but also sometimes they over-recover, so this is a moving target: under-recovery is not a given. A 2% p.a. implementation pathway is likely to be defensible in the current political environment and it will provide the responsible ministers with a wider range of options to consider.</p> <p>3. NTC should review the proposed levels of registration charges for bus, taking account of the results from the review of ESA-km attribution factors from proposal 1, the safety performance of bus compared to trucks and how this is best be reflected in the way their costs of the NHVR are recovered. Bus registration charges, by bus category, should be set to at least recover well estimated attributable costs, with any charges above that base limited to the proposed 2% p.a. pathway we propose for Option D.</p>	
NatRoad	24	Implementation options – multi-year price periods	<p>We note, however, that a similar proposal has been set out in the C-RIS. The C-RIS has as an implementation option a three-year price path with a fixed percentage increase each year. The illustrations in the C-RIS are respectively for a 3.5% and a 6% fixed price increase. In this submission, we indicate our preference for the current charges to be increased at the rate of inflation or 3.5% (whichever is the lower) until the HVRR process delivers a new model for heavy vehicle charges. Alternatively, the lower cost fixed price increase of 3.5% set out in the C-RIS is supported no matter the particular interim model utilised. For simplicity, however, we recommend the charging model in place before HVRR is implemented remains the current PAYGO model despite its inadequacies, some of which are discussed in this submission.</p>	Noted.
NatRoad	24	Implementation options – multi-year price periods	<p>This solution, we submit, is contemplated by the federal government's cost recovery guidelines³, in particular relating to partial cost recovery as follows:</p> <p>Australian Government entities should generally set charges to recover the full cost of providing specific activities. Partial cost recovery, which occurs when less than the full cost of a government activity is recovered, may be appropriate in some circumstances where:</p> <ol style="list-style-type: none"> charges are being 'phased in' full cost recovery would be inconsistent with community service obligations endorsed by the Australian Government the Australian Government has made an explicit policy decision to charge for part of the costs of an activity. 	Noted.

NatRoad	24	Implementation options – multi-year price periods	The NatRoad proposed solution will best accommodate the balance of competing factors that are in play when considering an interim determination: the trade-off between cost recovery over time and the impact on the industry, particularly an industry that has been hit hard by a range of external factors. The industry has sequentially suffered from the impact of bushfires, floods and now COVID-19, as acknowledged by transport ministers. These events and difficult industry conditions have constrained the industry’s ability to cope with increased costs, inclusive of government charges.	Noted.
NatRoad	24	Implementation options (general)	The C-RIS indicates that: ‘The increases of 3.5 per cent shown in example 1 of the three-year fixed price path option are intended to reflect the actual average annual growth rate in the heavy vehicle cost base from 2012–13 to 2021–22.’ That percentage increase or the rate of inflation, whichever is the lower, therefore remains the NatRoad preferred outcome. We therefore agree with fixed percentage price increases, a smooth pricing path for implementation.	Noted.
NHVR	24	Implementation options – multi-year price periods	Given the estimated range of under recovery as suggested in Table 22 (i.e. the cost bases for all options exceed revenue from current heavy vehicle charges by a range of between 8.2 per cent and 27.7 per cent), the NHVR suggests that a multi-year implementation model is likely to attract more support from industry and governments than any direct implementation initiative that attempts to redress the estimated heavy vehicle revenue shortfall.	Noted.
ALRTA		PAYGO (general)	ALRTA has participated in several NTC briefing sessions and worked closely with the ATA Transport and Economics Committee during the preparation of a submission. ALRTA generally supports the positions and technical recommendations contained in the ATA submission.	Noted.
Bus Industry Confederation		Limitations of the current charging framework	As the vehicle fleet electrifies, the RUC will become increasingly irrelevant. The current level of electrification is very low, such that the RUC and registration charges will be adequate for the upcoming determination. However, as electrification accelerates, as it inevitably will under pressures for Australia to improve its greenhouse gas emission performance, pressures will increase to move to an alternative road pricing model, across all vehicle classes. Any future alternative road pricing model should be based on (telematics driven) mass/distance/location (MDL) pricing, an approach that is also better suited to incorporate charges for external costs of HV road use. The BAN notes that external costs are not considered under the current pricing model. Efficient road use needs to also recognise, as part of the pricing model, the externalities (i.e. congestion mitigation, environmental gains, road safety savings, social inclusion benefits).	Noted.
NatRoad		Limitations of the current	In simple terms, the PAYGO model for heavy vehicle charges is broken. It should not be used other than as a 2021–22 baseline on which to calculate future HV charges. It assumes that all Australia’s roads are sealed when the majority are not. It operates to	Noted.

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		charging framework	<p>include all costs incurred in one year in the next year's charges. Capital and current costs are not separated.</p> <p>And it results in payments flowing to states and territories that do not take into account the real cost recovery need for road construction and maintenance as that is related to heavy vehicle usage.</p> <p>A new model is needed to underpin the HVRR process. In the meantime, a fixed price increase is a better outcome than PAYGO or alternative models.</p>	
NHVR		Pricing principles	<p>Moving forward, the NHVR supports the pricing principles originating from the Australian Transport Council (ATC) (now called the Infrastructure and Transport Ministers' Meeting, ITMM) and the National Cabinet (formerly the Council of Australian Governments). These principles provide guidance on how road use prices should promote optimal use of infrastructure, vehicle, and transport modes.</p> <p>In adopting these principles, the NHVR notes key considerations need to be explored including the ongoing impacts of COVID-19 on the Australian economy as well as the implementation of the Heavy Vehicle Road Reform on future determinations.</p>	Noted.
Philip Laird			<p>All motorists (except for electric vehicles) are now paying fuel excise, indexed to CPI, presently at 42.7 cents per litre. Yet a moderately laden semitrailer will cause 10,000 times the road wear and tear that an average sized car does. It does not make sense why the operator (and clients) of the semitrailer need only pay 26.4 cents per litre in discounted (since the year 2000) fuel excise. New Zealand has had since 1978 mass distance charges for heavy trucks ... As before, distance-based charging for the heavier trucks is long overdue.</p>	Fuel excise is a tax set by the government. Heavy vehicle charges historically have been set to achieve cost recovery independent of inflation.
CILTA			<p>However, as Table 1 shows all registration charges do not always get levied on a steady upward trend and there have been some notable hiccups in recent times in the expected 'smooth' registration charges line matching a smoothed moving average, cost recovery function.</p>	Noted. Increases for individual vehicle categories may arise because of changes to usage data or updated data on vehicles masses or ESAs.
CILTA			<p>Table 2 reflects the gradual increases and the more recent stabilisation of the Road User Charge. However, at this level along with the rises in State registration fees, especially since the CPI cap on registration charges was lifted in July 2009, there has still been massive over-recovery of costs from the industry.</p>	The consultation RIS contains information on the relationship between heavy vehicle charges revenue and the identified heavy vehicle cost base over time. In more recent years, the heavy vehicle cost base has exceeded revenue, which indicates that charges have under-recovered the cost base over this period.

<p>CILTA</p>			<p>As has often been stated by this author there is a light year of difference between operations in the 'Hire and Reward' sector versus the 'Ancillary' sector ...</p> <p>Firstly, Ancillary fleets, although many are small, these dominate the Australian road fleet population...This is over six times the kilometres performed by the ancillary operator, and yet their registration charges under the current PAYGO methodology are the same!!!! This is because the current charges are based on average kilometre by vehicle configuration which gives a massive cross subsidy to the Hire and Reward sector.</p>	<p>With the current charges consisting of RUC and yearly registration charges, it would not be possible to discriminate between different industry sectors, even if this was thought desirable. Also, the data on hire and reward versus ancillary in the SMVU may not be suitable, given the tendency for more detailed data in the SMVU to have higher relative standard errors (and therefore lower reliability).</p>
<p>CILTA</p>			<p>As a thought, the new road charging body could develop 'two' Road User Charges and 'two' Diesel Fuel Rebate rates, one for the Hire and Reward sector and one for the Ancillary sector.</p>	<p>This approach would add complexity and would require significant change including to legislation. Also, it is unlikely that the application of the separate rates could be enforced at reasonable cost under the current system.</p>
<p>VTA</p>	<p>Expenditure template and accountability</p>		<p>The VTA wishes to highlight several points and they include the following:</p> <ul style="list-style-type: none"> ▪ We recognise the complexities involved with the PAYGO model and the inherent limitations in the PAYGO methodology. ▪ Heavy vehicles should not be expected to continue to 'over-pay' their share of the costs. ▪ Due consideration and adjustment should be made to the tolls allocated to 'light' vehicles. ▪ Extrapolation of the data/evidence presented does not accurately cover the fact that heavy vehicles do not travel on all roads. ▪ The impact and disproportionate tolls paid by heavy vehicles for toll road use which are three times higher (or more) than light vehicle tolls. 	<p>The NTC's response to these issues is as follows:</p> <ul style="list-style-type: none"> ▪ Noted. ▪ Any direct implementation options are seeking to recover heavy vehicles' allocated costs (as calculated under the relevant model settings), while the price paths would be recovering less revenue than this. ▪ Under the proposed treatment of innovative funding and financing, toll revenue received by governments (including from light vehicles) is to be subtracted from the heavy vehicle cost base (while government costs on these roads would be added, so that it is the net costs from innovative funding and financing added or subtracted, as relevant). ▪ This issue is recognised to some extent in that a significant share of expenditure on local roads (75 per cent in urban areas; 50 per cent in rural areas) is excluded from allocable costs, on the basis that these

				<p>roads are used for access and amenity purposes.</p> <ul style="list-style-type: none">▪ The level of tolls set by private sector operators is out of scope for the determination. The PAYGO model is designed to recover the (net) costs incurred by governments on government-owned and -operated roads.
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