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MINISTRY OF TRANSPORT
TE MANATŪ WAKA

Land Transport Rules Reform Programme

Cost-Benefit Analysis of changes to vehicle safety inspection frequencies

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Executive summary

Overview

The Ministry of Transport Te Manatū Waka (the Ministry) is assessing the effects of lowering the frequency of Warrant of Fitness (WOF) and Certificate of Fitness (COF) inspections for light vehicles. The primary goal is to reduce the regulatory compliance burden while maintaining road safety.

New Zealand requires vehicles to have regular inspections to check they are safe and roadworthy. Vehicle condition worsens with age and use, increasing the risk of mechanical failure and crashes. Vehicle defects caused 0.6% of injury crashes in the ten years to 2024, down from 0.9% in the previous decade. Inspections can be costly for owners, so the challenge is managing the safety risks without undue burden.

This report presents an assessment of the safety and compliance cost effects of two policy options (Table 1), which propose changes to 4 to 6 vehicle age groups (hereinafter referred as vehicle groups).

Methodology

The safety assessment focuses on crash types linked to defects that inspections can identify. Our approach compares the crash risk for vehicles with these defects to those without, using a relative risk method. Regression analysis, based on crash data from 2015 to 2024, estimates how crash risk increases with time since the last inspection. The compliance effect assessment measures how changes in inspection frequency affect vehicle owners in cost and time, to show the overall impact on compliance and safety effects.

Assumptions

The analysis uses a set of explicit assumptions to quantify the costs and benefits of vehicle inspection regimes.

- Vehicle owners face compliance costs beyond inspection fees, including wait and travel times. This opportunity cost significantly contributes to the overall burden and better reflects the real effect on individuals and businesses.
- The analysis assumes that repair needs may be higher than necessary under current inspection settings. This is based on the idea that some repairs completed to meet inspection requirements could be unnecessary for practical safety reasons or might be carried out earlier than needed.
- Estimating safety benefits must account for under-reporting of vehicle defects in crash statistics. Since defects are not always identified at crash scenes, the preventive effects of inspections may be underestimated. We adjust safety effects by applying under-reporting assumptions.

These assumptions capture both direct and indirect costs to ensure the analysis reflects the realities faced by vehicle owners and the wider transport system.

Limitations and caveats

The following points set out key limitations and caveats associated with the modelling and its results.

- Our analysis excludes the effect of WOF/COF inspections during vehicle transactions. Around one million light vehicles change ownership each year, and the 2012 CBA suggests this could lower safety effects by about 10%.
- We have not considered the effects of voluntary maintenance and repairs by safety-minded car owners. The 2012 VLR CBA suggests this could lower safety effects by 26% to 28%.
- This analysis focuses only on crash risk, excluding defects such as seatbelts that do not directly raise crash risk but can affect injury severity. Therefore, the safety effect is understated.

- The vehicle fleet projections used to calculate inspection volumes are based on data up to 2023. More recent fleet projections are not yet available, but this mainly affects the scale of the total net benefits and therefore will not affect the likely range of the estimated Benefit Cost Ratio (BCR).

Finding and conclusion

Table 1 shows **both options to reduce how often WOF and COF inspections are required to deliver net benefits to New Zealand** society compared with current settings. The proposed changes would reduce compliance costs for vehicle owners, mainly through fewer inspection fees and less time spent on inspections. This is reflected in positive Net Present Values (NPVs) and high BCRs.

Table 1. Inspection frequency options for in-service private light passenger vehicles

<table>
<tr><th colspan="2">Inspection frequency by vehicle group and inspection type</th><th>Current policy</th><th>Option 1</th><th>Option 2</th></tr>
<tr><td rowspan="6">WOF light vehicles</td><td>< 3 years old</td><td colspan="3">None</td></tr>
<tr><td>≥ 3 to 4 years old</td><td>Annual</td><td colspan="2">None</td></tr>
<tr><td>≥ 4 to 10 years old</td><td>Annual</td><td colspan="2">Biennial</td></tr>
<tr><td>≥ 10 to 14 years</td><td colspan="2">Annual</td><td>Biennial</td></tr>
<tr><td>Pre-2000 YOM vehicles under 40 years</td><td>6-monthly</td><td colspan="2">Annual</td></tr>
<tr><td>Other post-2000 YOM vehicles</td><td colspan="3">Annual</td></tr>
<tr><td rowspan="3">COF light vehicles</td><td>Rental < 5 years</td><td>6-monthly</td><td colspan="2">Annual</td></tr>
<tr><td>Rental ≥ 5 years</td><td colspan="2">6-monthly</td><td>Annual</td></tr>
<tr><td>Other light COF vehicles</td><td colspan="3">6-monthly</td></tr>
<tr><td rowspan="2">Effects</td><td colspan="2">Average annual reduction in the number of inspections</td><td>0.9 million</td><td>1.3 million</td></tr>
<tr><td colspan="2">Average annual Increase in death and serious injury (DSI) crashes</td><td>0.7 – 2.4</td><td>2.9 – 6.6</td></tr>
<tr><td rowspan="2">CBA results</td><td colspan="2">Benefit to cost ratio (2027-2055) at 2% real discount rate</td><td>8.0 - 29.0</td><td>4.8 - 11.6</td></tr>
<tr><td colspan="2">Net present values (2027-2055) at 2% real discount rate, $m</td><td>$1,864 - $2,786 m</td><td>$2,644 - $4,101 m</td></tr>
</table>

***Option 2* yields a higher overall NPV due to wider coverage but has a lower BCR and net benefit per vehicle**. Vehicles aged 10-14 years strongly influence these results, being a large fleet segment and experiencing the greatest increase in safety risk. Rental vehicle groups gain the highest net benefit per vehicle, reflecting high compliance costs, low safety risks, and small fleet sizes.

Model results are robust to discount rate assumptions, and uncertainties around some vehicle groups (eg *Pre2000* and *rental*) are unlikely to affect overall conclusions due to their small share of the fleet. However, the analysis covers only safety and compliance costs; enforcement and administrative costs were not estimated, and some safety effects, such as those affecting crash severity, were excluded.

The findings support adjusting inspection frequencies, provided steps are taken to manage increased safety risks for certain groups, especially older vehicles. The results offer a sound basis for policy decisions, balancing road safety with reduced regulatory burdens for vehicle owners across New Zealand.

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Glossary

Term	Acronym	Definition
Benefit-Cost Ratio	BCR	Indicates the economic effectiveness of an option. Estimated as the present value benefits divided by the present value costs
Biannual		Twice a year
Biennial		Every two years
Certificate of Fitness	COF	Inspection to assess that a vehicle meets required safety standards for commercial use
Crash Analysis System	CAS	A system for storing data for on-road crashes reported to NZ Police. CAS is administered by the NZ Transport Agency
Crash contributing factor		An element or condition that is present in a crash and may have potentially contributed to the crash occurring
Discounting/discounted		Estimating the present value of a monetary stream over time
Inspection-identifiable defect		Any vehicle fault that would be tested for in WOF/COF inspection and would fail the inspection if found
Light vehicle		Motor vehicle (excluding motorcycles) with a maximum gross weight of 3.5 tonnes or less
Linearity		A straight-line relationship between two variables
Monetise		To convert something into monetary values
Motor Vehicle Register	MVR	A system that stores data on vehicles currently registered in NZ
Motorcycle		A motor vehicle running on two wheels, or not more than three wheels when fitted with a sidecar
Net benefit / net cost		The overall economic gain. A net benefit means the total benefits exceed the total costs and vice versa for net cost
Net Present Value	NPV	Is the difference in present value benefits and present value costs
Nominal		The face value of a monetary value without adjusting for purchasing power or the time value of money
Passenger service vehicle	PSV	A vehicle that is used to provide commercial passenger services (eg taxi)
Present value		The current value of a future monetary stream after accounting for the time value of money – a dollar received today is worth more than a dollar received in future
P-value		Statistical measure of the probability that a result occurred by chance – used to determine the statistical significance of a relationship
Regression		A statistical approach used to find a relationship between two or more variables, the nature of that relationship and the strength
Rental vehicle		A vehicle that is hired out for use on a temporary basis
Residual		The difference between an actual data observation and the value predicted by a statistical model at the same point

Term	Acronym	Definition
Standard deviation	SD	Measure of how spread-out data values are in relation to their mean value
Statistical relationship		The way two or more variables change relative to each other
Statistical significance		The relationship between two variables is real and probable rather than due to random chance
Trailer		Vehicle without its own motive power that is designed to be towed
Transport Service Delivery Agent	TSDA	An organisation delegated by the NZ Transport Agency to carry out customer service and licencing activities. It includes the AA and VTNZ
Variance		Measures how large of a spread there is within a data set
Vehicle Fleet Model	VFM	Model developed by the Ministry to project the composition of the future motor vehicle fleet on the road, its travel, energy use and greenhouse gas emission
Vehicle identification number	VIN	A 17-character number that is assigned to identify and track individual vehicles
Vehicle Kilometres Travelled	VKT	A measure of vehicle travel
Vintage vehicle		Any vehicle that is 40 years old and over
Warrant of Fitness	WOF	Inspection to assess that a vehicle meets required safety standards for private use

1 Introduction and background

The Ministry is investigating the potential effects of reducing the WOF and COF inspection frequencies for light vehicles to reduce regulatory compliance burden, without unduly affecting road safety. This report summarises our assessment of the effects on safety and compliance cost from two policy options (involving changes to 4 to 6 vehicle groups) to support policy development.

NZ requires vehicles to undertake regular inspections to check they are safe and roadworthy. The aim of this regime is to reduce the number of on-road crashes, and the associated social harm, by assessing that vehicles are maintained to a safe standard. This is because the condition of a vehicle deteriorates with time and use, increasing the risk of a mechanical failure that leads to a crash.

The trade-offs of having an inspection regime includes an added compliance and financial burden to vehicle owners. It is important to target the inspection frequency at a level that effectively reduces to the safety risks posed by vehicle defects without unreasonably imposing a significant burden on vehicle owners.

1.1 The current inspection regime

Table 1 shows the frequencies for different light vehicle groups under the current regime. The current frequencies were introduced in the 2014 Vehicle Licencing Reform (VLR). Prior to that most vehicles had 6-monthly inspection frequencies.

The 2014 VLR changes were supported by a 2012 Cost-Benefit Analysis (CBA) that investigated several options for changing inspection frequencies across different vehicle groups. The largest estimated benefits were a reduction in the compliance costs of inspections and a small reduction in the resources allocated to enforcing compliance with the regime. The estimated cost was an increase in the number of road crashes. It found reducing the inspection frequencies for light vehicles manufactured after 2000 would deliver net benefits to society. Those findings were based on the relevant vehicle groups and crash types at the time.

Since then, the risks from vehicle defects in crashes may have change over time due to technological, social and regulatory factors such as:

- newer vehicles with different safety features and technologies
- fewer vehicles manufactured before 2000 in the fleet
- ongoing investment in road safety features (eg median barriers)
- potential changes in the prevalence of other contributing factors that are present in crashes and,
- the implementation of other vehicle standards that influence vehicle choice.

Vehicle defects accounted for 0.6% of all injury crashes for the ten years 2015 to 2024, compared to 0.9% for the ten years 2004 to 2013. This suggests that the relative crash risk of vehicle defects has decreased over time. Given this and the above factors, the Ministry is investigating the current inspection regime is still fit for purpose. This report summarises the CBA undertaken to support the policy development.

1.2 Cost benefit analysis of the 2014 Vehicle Licencing Reforms

The 2014 VLR CBA (Allison, Leung, & Parker, 2012) evaluated a range of options that reduce how often vehicles require a WOF/COF inspection, from modest easing of the current schedule through to major reforms where inspections occur mainly at change of ownership. The estimated Net Present Values (NPVs) rise from the lower end for the mildest changes to the highest for the most extensive reform, and the Benefit–Cost Ratios (BCRs) span from roughly 5 for the least stringent option to around 13 for the more moderate reforms.

These high BCRs reflect the substantial reductions in inspection requirements, compliance time, and avoidable repairs that dominate the overall benefits. Alongside these economic gains, the modelling also estimates the likely annual increase in crashes and injuries associated with reduced inspection frequency.

The mildest changes lead to only very small increases in injury crashes, while the most extensive reform produces the largest, but still limited, rise in crash numbers. The estimated annual increases range from only a handful of additional injury crashes under the lighter reforms to several dozen additional injury crashes under the least stringent option. These estimates incorporated behavioural factors such as voluntary safety checks and inspections at change of ownership, which help offset the reduction in mandatory inspections.

1.3 Evaluation of the 2014 Vehicle Licencing Reforms

An evaluation of the 2014 VLR changes was undertaken between 2021 and 2023 in two stages.

The first stage was a high-level evaluation of the potential safety effects of the WoF policy after it took effect. It found a slight increase in the risk of death and serious injury crashes, after controlling for increases in travel and the size of the vehicle fleet.

The second was an evaluation of the key costs and benefits of the 2014 VLR changes after they took effect. It found slightly higher safety effects than the original CBA (due in part to higher than anticipated travel and fleet growth) and higher a higher reduction in the compliance burden benefits. It also concluded the changes delivered net benefits to society. This was after a high adjustment based on the unrealistic assumption that Police could only identify about 25% of inspection-identifiable defects in crashed vehicles.

1.4 Scope of policy

In scope of this analysis are:

- privately owned light vehicles (up to 40 years old) and light rental vehicles (of all ages)
- changes in the number of fatal, serious and minor crashes and associated social costs and,
- changes in compliance burden resulting from reduced inspections (ie, costs of inspection, compliance time and repair costs).

Out of this analysis are:

- motorcycles – excluded as preliminary analysis indicates a higher safety risk for this vehicle class (see Annex 9) and warrant further investigation to better understand the effects
- trailers – excluded due to limited data
- passenger service vehicles, campervans and heavy vehicles – excluded as they are not affected by the policy
- implementation and enforcement costs – excluded as details on implementation and enforcement options are not yet available
- any changes to the scope of inspections and increased penalties for non-compliance with vehicle licencing requirements – excluded as specific details are not available during this analysis and,
- effects on vehicle exhausts and tyres – excluded but the effects are likely to be negligible.

2 Methodology

2.1 Approach

2.1.1 Effects assessed

This CBA focuses on the two main economic effects, safety and compliance costs (Table 2), due to time constraints and limited policy implementation detail.

The safety effects measure the change in the number of road crashes with vehicle defects. The main purpose of WOF/COF inspections is to check that vehicles are safe and roadworthy at the time when the vehicles are inspected – changing the inspection regime could change the risk of being involved in a crash should there be a delay in detecting any vehicle defects.

The compliance effects consist of the changes in three costs of complying with the WOF/COF inspection regime including the:

- time vehicle owners spend getting their vehicle inspected, which includes wait and travel time
- resource costs related to WOF/COF inspections (using inspection costs as a proxy) and,
- repair costs resulting from a change in inspection frequencies.

Business effects on the industry, such as revenue and job losses, are not included in the CBA as these are transfer payments. They are, however, provided separately to gauge the effects on the industry.

The NZ Transport Agency (NZTA) charges a fee for WOF/COF labels to recover related administrative costs. Changing the frequency of inspections affects both the resources and NZTA's revenue recovery needs. This is presented for informing NZTA's cash flow situation only. As this cost is already included within the inspection fees, it is not listed as a separate item in the CBA.

Table 2: Summary of the quantitative effects assessed

Analysis type	Effects	Measures (changes in)
CBA effect	Consumer compliance costs and charges	Time and inconvenience to comply
		Annual inspection costs
		Avoidable repair costs
	Safety	Frequency and of inspection-detectable injury crashes
Non-CBA effect	NZ Transport Agency label revenue (non-CBA item)	Revenue from WOF/COF labels
	Effects on Industry (non-CBA item)	Revenue and employment for inspection providers

2.2 Data collection and preparation

2.2.1 Data and inputs

Table 3 summarises the key data inputs and their sources. For practical purposes, we summarise some inputs at a high-level though the analysis uses their disaggregated values.

Table 3. Key data and inputs used in the analysis

Dataset/input	Detail	Values	Source
Crash analysis system (CAS)	We used crash date, severity of crash, vehicle id (plate), and type of contributing vehicle factors (faults) for determining if it was an inspection related crash or not.	Various	(NZ Transport Agency Waka Kotahi, 2026)
Motor vehicle register (MVR)	We used vehicle id (plate), vehicle type, vehicle inspection and licencing history, vehicle age, vehicle kms travelled and use (eg rental or passenger service vehicle) for the analysis.	Various	(NZ Transport Agency Waka Kotahi, 2026)
Vehicle fleet model (VFM)	Aggregate projections of vehicle numbers by vehicle age to 2055 (based on data up to 2023).	Various	(Ministry of Transport Te Manatū Waka, 2024)
Under-reporting of vehicle defects	Accounts for potential under-recording of defects in crashes due to difficulties in identifying them correctly at the crash scene. A scaling factor of 0.3 adds 30% to the total.	Low: 0 Mid: 0.3 High: 1	Assumed based off 2012 CBA
Safety improvement trend	Annual improvement in vehicle safety under the business-as-usual scenario because of newer vehicles with more safety features entering the fleet over time.	1% to 2% per annum	Assumed
Social cost of road crashes ($/crash)	Average social cost per reported road injury crash, in June 2024 dollars.	Fatal $17,081,200 Serious $1,792,500 Minor $350,800	(Ministry of Transport Te Manatū Waka, 2025)
Inspection fees ($/inspection)	Average fees charged for WOF/COF inspections which are assumed to represent the economic resource cost of those inspections (ie labour, stationary, property costs etc).	WOF: $50 to $90 COF: $150 to $200	Assumed based off Google searches
Compliance costs ($/hour)	The monetary cost of compliance time per hour in June 2024 dollars.	Low $33 High $34.96	(The Treasury Te Tai Ōhanga, 2025) (NZ Transport Agency Waka Kotahi, 2025)
Compliance time (minutes)	The time spent by vehicle owners on WOF/COF inspections including waiting and travelling to/from inspection facilities.	WOF: 30 to 60 minutes COF: 60 to 120 minutes	Assumed based off Google searches
Repair costs ($/annum)	Average annual repair costs in June 2024 dollars.	Various across different groups	(Paling, 2023)
Non-TSDA market share (%)	Transport Service Delivery Agents (TSDAs) include AA and VTNZ. Non-TSDAs are regular mechanics.	80%	Assumed from 2012 CBA (Allison, Leung, & Parker, 2012)
Avoidable repairs (%)	Proportion of average annual repairs that were undertaken to pass an inspection but could be avoided.	0 to 10%	Assumed from 2012 CBA (Allison, Leung, & Parker, 2012)

Dataset/input	Detail	Values	Source
Discount rate (%)	Rate used to convert future monetary values to present values (today's dollars).	SRTP: 2% (real) SOC: 8% (real)	(The Treasury Te Tai Ōhanga, 2025)
NZTA label fee	A fee that NZTA charges for providing WOF/COF labels to recover the costs involved with producing those labels.	$4.16 per inspection	NZTA (as of March 2026)

2.2.2 Crash Analysis System data

The CAS is administered by the NZ Transport Agency and captures on-road crashes reported to the NZ Police. These reports are designed to capture the potential contributing factors to support development of preventive or corrective actions or interventions.

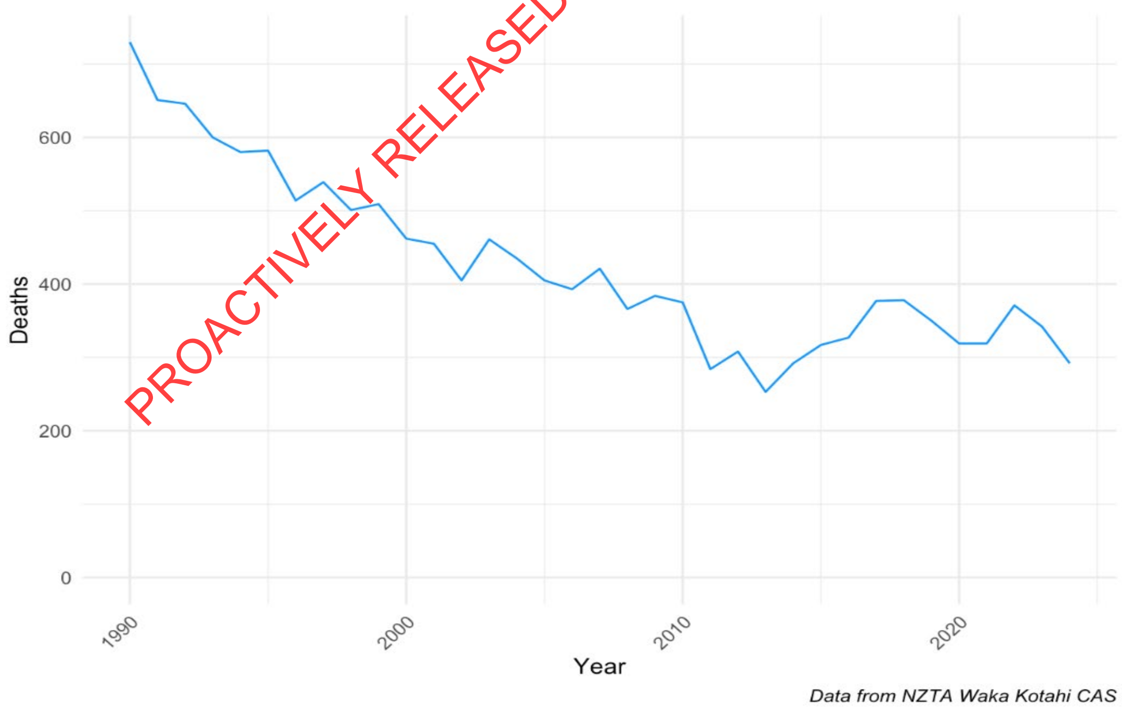
In this analysis, the contributing factors that we are primarily interested in are inspection-related vehicle faults. An inspection-related crash is where the vehicle involved (not necessarily responsible) had a vehicle factor that would have been picked up at a WOF/COF inspection.

All other crashes (non-inspection-related crashes) are where the vehicle did not have one of those factors (see Annex 1 for the list). This category includes certain contributing factors that, would technically fail an inspection, either:

- are so extreme that a vehicle would not undergo an inspection in that condition, eg, blown-out tyre or,
- would not contribute directly to the likelihood of being in a crash, eg, airbag failure[1].

Figure 1 shows that deaths from on-road crashes from 1990. This shows road death trend has been evolving over time. This analysis concentrates on crash data from 2015 to 2024, with 2014 omitted to prevent potential confounding effects associated with the transition to the current regime.

Figure 1. Road deaths for calendar years 1990-2024[2]



[1] Though these factors may contribute to the severity of a crash (ie serious crash vs minor crash) if present.
[2] Source: Ministry of Transport's Annual crash statistics - (Ministry of Transport Te Manatū Waka, 2025)

This analysis focuses on crashes for which it was possible to identify whether the driver was primary at fault (ie, vehicles with a number plate and contributing factors entered). For multi-vehicle crashes where both vehicles have inspection-identifiable factors, only the primary fault vehicle is included.

We consider including drivers who were partially at fault would have a small effect on the analysis results given the low number of such cases as indicated by Table 4.

Table 4. Vehicles in crashes with inspection identifiable factors by driver fault for 2025-2024

Driver fault	Number of vehicles
Primary	1,739
Partially	86
No contribution	214
Blank/unknown	568

2.2.3 Motor Vehicle Register data

The MVR stores information about vehicle specification, ownership and licencing of the NZ fleet. Specific fields of interest included:

- registration and manufacture dates for determining vehicle age
- vehicle class for identifying light vehicles
- VEHICLE _USAGE – for identifying rental vehicles
- INSPECTION_TYPE – for identifying whether the vehicle had a WOF or COF inspection and,
- inspection dates and expiry for determining when the vehicle had its last inspection and when that expires.

We only included records where a vehicle had passed its most recent inspection. This excludes:

- instances where vehicles failed and were retested and,
- crashes where a vehicle had failed its last inspection.

Under existing regulations, it is illegal to drive a vehicle without a valid WOF on public roads (except for taking it somewhere for repair or inspection). Crashes occurred resulting from such incidents are unlikely to be affected by changes to inspection frequency.

2.2.4 Matching CAS to MVR and defining vehicle groups

CAS data was matched to MVR data using number plates and vehicle identification numbers. We then determine whether each vehicle had a valid WOF/COF licence at the time of the crash by comparing the licence's expiry date with the vehicle's crash date. Similarly, we estimate how many weeks had passed between the vehicle's last inspection and its crash date.

The analysis groups vehicles into different groups (as shown in Table 1) for the safety risk analysis and crash projections. Due to few crash observations for vehicles aged 3 to 4 years, the safety analysis also includes vehicles aged under three years.

The target groups are defined as:

- *≤4yrs* – defined as vehicles aged between 3 (inclusive) and 4 years for crash projections and as vehicles under 4 years for the safety risk regressions
- *4_10yrs* – defined as vehicles aged between 4 (inclusive) and 10 years
- *10_14yrs* – defined as vehicles aged between 10 (inclusive) and 14 years

- Pre2000 – defined as vehicles manufactured before year 2000
- Rental<5yrs – defined as vehicles aged under 5 years that have an MVR "VEHICLE USAGE" value of 7. These are vehicles that are classified as rental vehicles
- Rental≥5yrs – defined as vehicles aged 5 years and over that have an MVR "VEHICLE USAGE" value of 7 and,
- Unchanged – all vehicles not in the above groups for a given option are unchanged by the policy and excluded from the effects.

2.3 Safety risk analysis

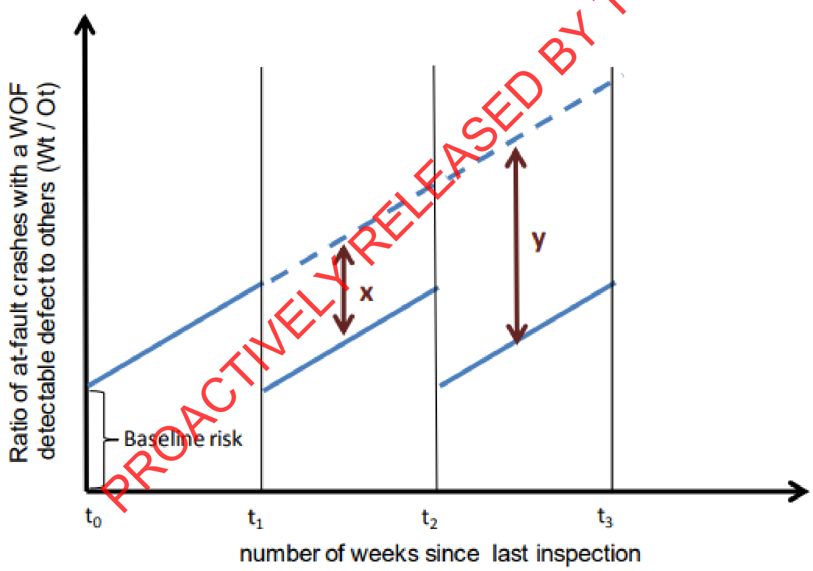
To understand the safety implications, we investigated whether there was a relationship between the time since a vehicle's last WOF/COF inspection and the likelihood of it being involved in a crash.

Figure 2 demonstrates the theory underpinning this (Allison, Leung, & Parker, 2012). Our hypothesis is all vehicles have a baseline risk when driven on road after which the risk increases over time because of wear and tear to the vehicle's mechanical systems. WOF/COF inspections intend to identify any safety defects that emerge over time to enable corrective treatments.

When a vehicle passes an inspection, its safety risk is reset to the baseline level. However, if more time is allowed between inspections, the vehicle's safety risk increases further before it is reset back again to its baseline level following the next inspection.

The areas x and y in Figure 2 represent the effect of reducing the time between inspections. To determine this, we examine how the safety risk changes over time under the current inspection regime and extend the relationship to the increased time between inspections.

Figure 2 Graphical illustration of the safety estimation approach



2.3.1 Method

Our method used econometric regression analysis to empirically determine if there was an association between time between inspections and the relative risk ratio (defined as the ratio of at-fault crashes with an inspection-identifiable defects to other crashes) for all injury crashes.

We used the matched CAS-MVR (2015 to 2024) dataset to calculate the relative risk ratios for injury crashes for each number of weeks since last inspection. We excluded any weeks where the estimated relative risk was zero due to there being no inspection-identifiable crashes in those weeks.

We fitted the simple linear regression for each vehicle group separately to determine the baseline risk level and the slope coefficient for the relative risk ratio. We chose weeks as the time increment because this offered computational convenience and ensured sufficient data is available; using days or months would have reduced the number of observations and potentially complicated the analysis.

2.3.2 Results for relative risk ratios

After we fitted the econometric models for each vehicle group, we run diagnostics to assess the viability of the models and extract the coefficients to use.

Table 5 summarises the model parameters while Annex 2 provides more detail on the parameters. To interpret the results:

- the intercept represents the baseline risk not related to the number of weeks since the previous inspection and,
- the relative risk coefficients are the incremental increases in relative risk per week since the previous inspection.

Table 5. Changes in relative risk since last inspection (for each week increment)

Light vehicle age group	Intercept[3]	Relative risk coefficient (ie slope of the risk line)			Degrees of freedom
		Low limit estimate (-2SD)	Central estimate	Upper limit estimate (+2SD)	
Up to 4 years	0.00071	+0.0002	+0.0007***	+0.0012	19
4 – 10 years	0.0078***	-0.0000	+0.0001*	+0.0002	45
10 – 14 years	0.0062***	+0.0001	+0.0002***	+0.0003	49
Pre-2000 (<40 years)	0.0159***	-0.0001	+0.0002	+0.0006	26
Rental under 5 years	This vehicle group is modelled using the relative risk estimates for rental vehicles ≥ 5 years due to limited historic crash data.				
Rental over 5 years	0.0169**	-0.0000	+0.0008*	+0.0016	3

Note: Asterisks denote statistical significance at 1% (***), 5% (**) and 10% (*) based on the coefficient's p-value.

SD – Standard deviation. Degrees of freedom is the number of observations minus 2.

Results show that relative risk increases over time since the last inspection, though this varies by vehicle group due to differences in inspection frequency and level of travel. Relative risk also tends to rise as vehicles age.

Specific observations of the results include:

- *≤4yrs* vehicles have a high relative risk due to the longer distances they travel. Though, they have a much lower baseline risk.
- *4_10yrs* vehicles have the second highest number of observation and the lowest relative risk increase over time, but the estimate is subject to a higher level of uncertainty. Figure 3 shows that the observations are spread somewhat evenly across time, which explains the lack of a strong relationship.

[3] This risk is unrelated to the weeks since last inspection

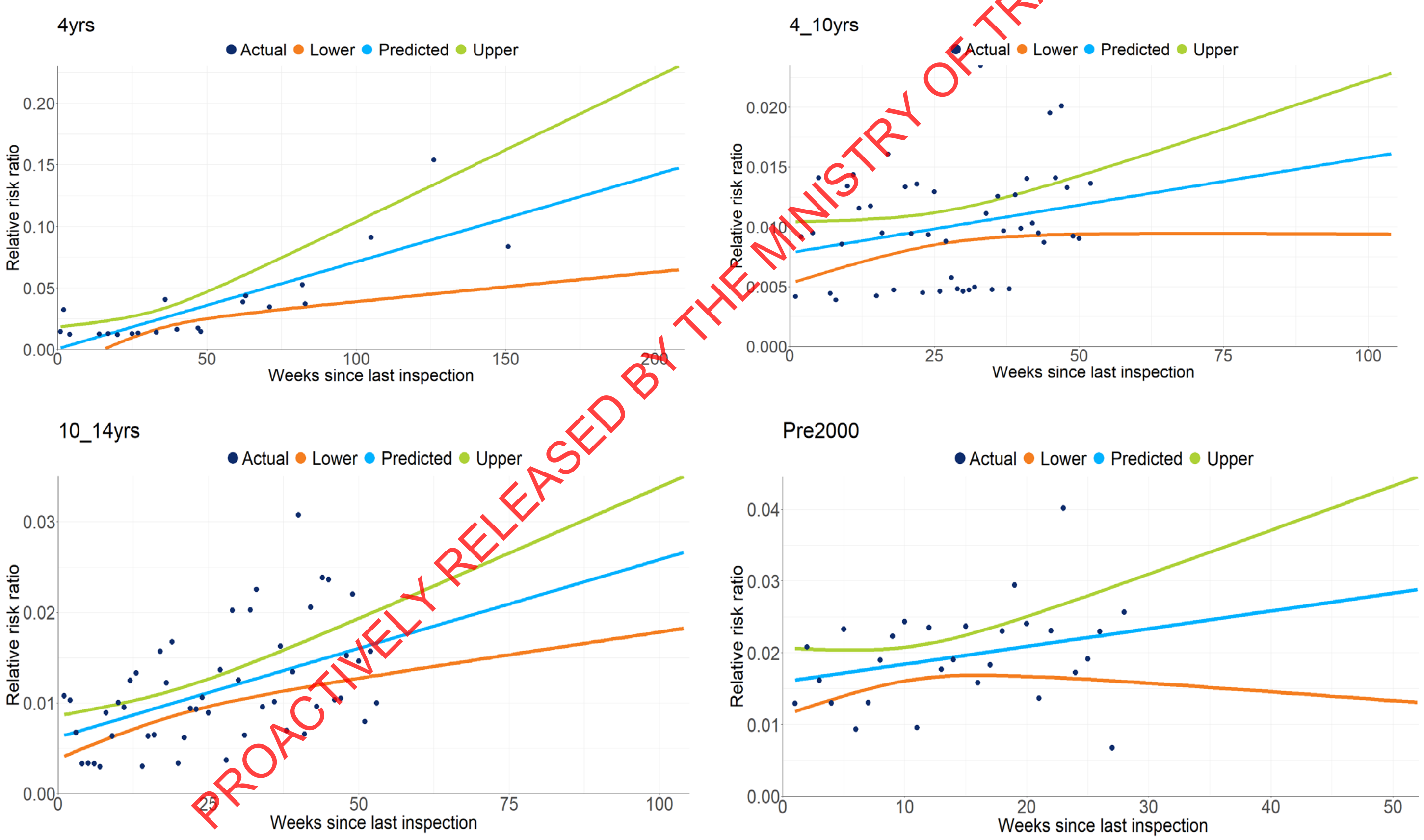
- *10_14yrs* vehicles have a low relative risk increase over time (which is significant at the 1% level) and the highest number of observations.
- *Pre2000* vehicles have a low (but not statistically significant) relative risk increase over time. This could reflect their lower travel level.
- *Rental≥5yrs* vehicles have the highest relative risk increase over time (significant at the 10% level), but this is supported by very few observations.

Regression results were unable to be derived for the *Rental<5yrs* vehicle group because there was only one crash with an inspection-identifiable contributing factor across 10 years of crash data[4]. We instead apply the results for the *Rental≥5yrs* to the *Rental<5yrs* vehicle group in the safety risk analysis as both vehicle groups have the same inspection frequency.

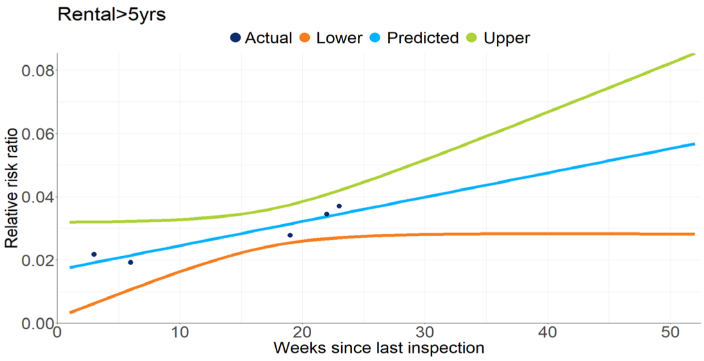
2.3.3 Plotting the predicted relative risk ratios

Figure 3 shows how the modelled relative risk ratios increase with time (including the proposed extensions) since last inspection compared to the observed data.

Figure 3. Fitted plots for relative risk ratios over time by vehicle group



4 As we could not establish a statistical relationship between time since last inspection and the relative risk ratio



From the above plots we can see:

- Most points for *≤4yrs* fall within the first 52 weeks since their last inspection. Afterwards there are fewer points[5] with a wider spread represented by the divergence between the lower and upper predictions.
- *4_10yrs* and *Pre2000* also have significant divergences between their lower and upper predictions reflecting how the relative risk ratios appear to be more evenly spread across time.
- *10_14yrs* shows a strong trend in its data points which results in its lower and upper predictions diverging the least.
- *Rental≥5yrs* have very few data points which results in a high divergence over time.

All vehicle groups have inspection-identifiable crashes occurring with the first few weeks after an inspection, which means vehicle defects can occur any time after the last inspection. The inspection effects are only relevant at the time of the inspection.

2.3.4 Model diagnostics

Annex 3 shows the additional diagnostics used to assess the models.

- *Posterior predictive check* tests if the models give valid predictions.
- *Linearity of residuals* checks that the linear model is appropriate and not mis-specified.
- *Homogeneity of variance* checks that the variance in relative risk ratios is consistent across different levels of time since last inspection.
- *Influential observations* identify any outliers or points with disproportionate leverage.
- *Normality of residuals* checks that the model residuals are normally distributed which is a key assumption for the confidence intervals.

Vehicle groups *4_10yrs*, *10_14yrs* and *Pre2000* generally perform well across all diagnostics.

Vehicle groups *≤4yrs* and *Rental≥5yrs* perform poorly across all diagnostics.

2.3.5 Overall conclusions for relative risk ratios

Based on all three sets of results we can conclude that *10_14yrs* have the most reliable and consistent relative risk estimates. *4_10yrs* have a medium level of reliability, while all other vehicle groups have a lower level of reliability in their estimates.

A statistically unreliable or non-existent relationship could suggest that the increased time between inspections would not increase the risk of crashes with inspection-identifiable faults. The purpose of a CBA

[5] Note that this does not imply fewer crashes as the points are a risk ratio between different crash types and can result from both low and high crash numbers.

is to weigh the potential effects of the policy against each other while accounting for uncertainty. The statistical testing done here provide context to help us interpret the reliability of the results. Applying a weak model may imply that we end up overstating the safety effects for some vehicle groups, but it serves as a useful sensitivity test of the policy if the benefits still outweigh the safety costs.

For these reasons, we use the relative risk ratios in Table 5 for all the analysis, even though some estimates are not statistically significant.

2.4 Fleet and travel analysis

To estimate the total costs and benefits, we needed the projected number of vehicles and vehicle kilometres travelled (VKT) over time for each vehicle group.

2.4.1 Method

Our method involves scaling the VFM fleet and related projections to our MVR dataset for the following reasons:

- To separate rental from other COF vehicles as these breakdowns are not available from the 2024 VFM.
- To disaggregate projections for vehicles aged 30 and over. We need these projections for analysing the *Pre2000* vehicle group as VFM included vehicles under 30 years as one age group which makes the *Pre2000* vehicle group become unidentifiable after 2029.

We estimate the non-rental vehicle groups using VFM's vehicle age and year of manufacture (YOM) fields. The scaling factors for aligning VFM with the MVR are estimated as the ratio between the MVR and VFM vehicle numbers for historical years up to 2023. The projected years apply the scaling factors for 2023.

For the two rental vehicle groups, we take the MVR's historical estimates and assume that the trend over time is likely to be consistent. We run simple linear regressions to establish how the annual volume of rental vehicles and their VKT change with time. We used related trends to project future rental vehicle fleet size and their VKTs.

A simple linear regression model was used to project Pre2000 vehicle fleet through 2039, when the fleet reaches zero because all those vehicles will be considered vintage by then[6].

2.4.2 Fleet and VKT projections

Figure 4 shows the vehicle fleet estimates for each vehicle group while Figure 5 shows their VKT estimates. The solid lines represent historical estimates up to 2023, while the dotted lines represent the post-2023 projections. Note: *Rental≥5yrs* is shown as *Rental>5yrs* in both figures.

Most vehicle groups have fluctuated over the historical years and sometimes the trends move in different directions. This is likely because they are substitutes where:

- people's preferences for different vehicles change
- supply and other market factors change and
- vehicles transition between vehicle groups based on age or usage.

The *Pre2000* trend consistently reduces over time, which will be due to those vehicles leaving the fleet or transitioning to vintage status.

Most projected trends are stable and consistent with recent historical years, except for *10_14yrs* which are projected to increase.

[6] As of September 2025, light vintage vehicles are only required to undertake annual WOF inspections.

Figure 4. Fleet projections by vehicle group

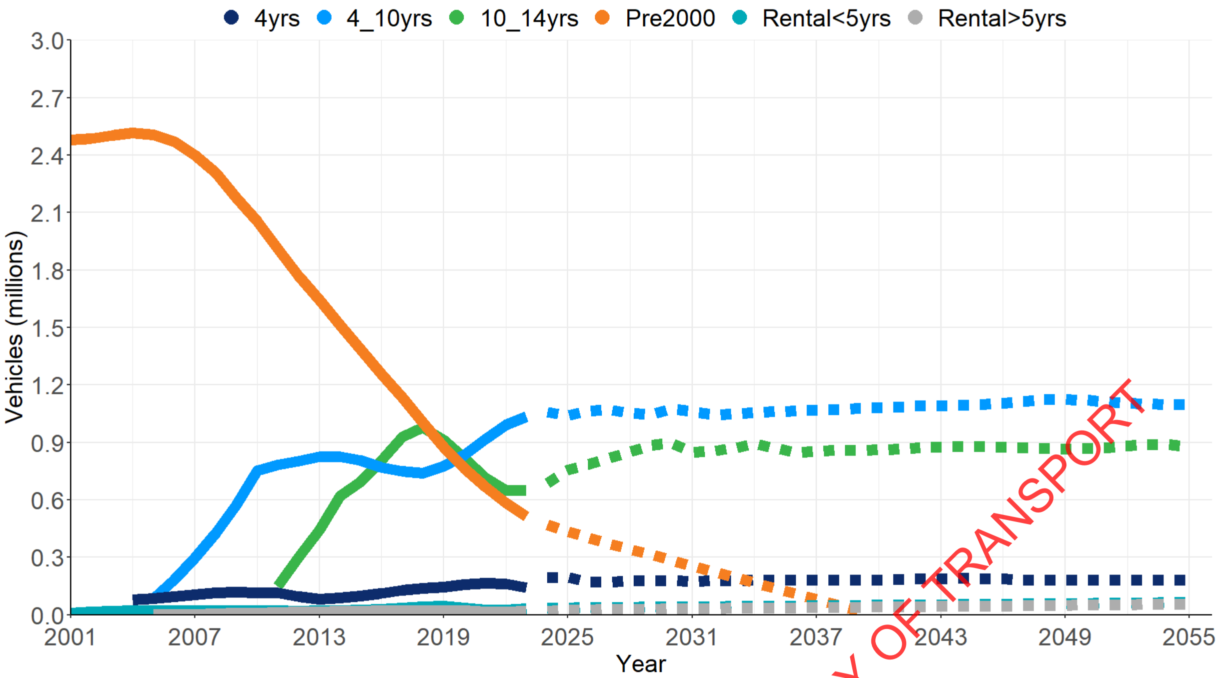
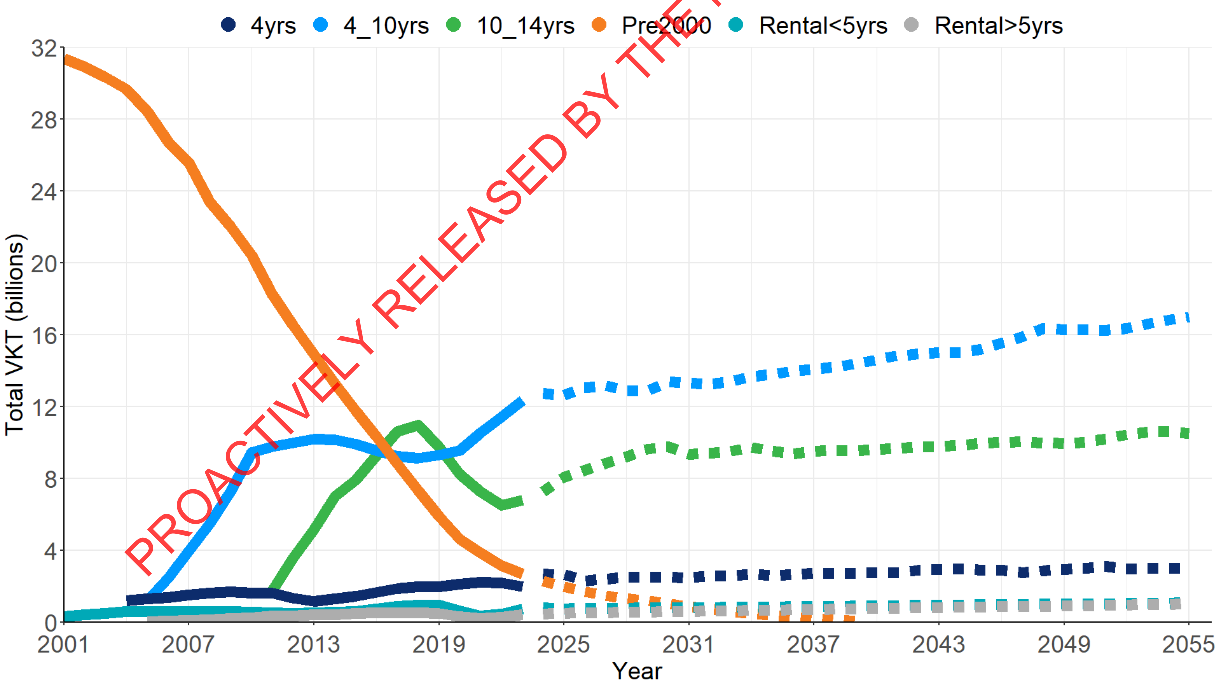


Figure 5. Total Vehicle Kilometres Travelled by vehicle group (billion kms)



3 Analysis and results

The outputs from the previous sections are used to estimate the effects of the policy. These include the monetised economic effects included in the CBA and other quantitative or qualitative policy effects that are not included in the CBA.

All monetary figures are in June 2024 prices.

3.1 Monetised costs

The sole monetised economic cost estimated in this analysis is an increase in the social cost of road crashes and injuries, resulting from an increase in the risk of inspection-identifiable crashes[7]. We calculate the increased social cost by estimating the increase in crash numbers by severity and applying their respective average social cost per crash.

3.1.1 Estimating the increase in crash numbers

We estimate the safety effects through the key steps below.

(a) Calculating the risk change between the case with and without policy changes. As shown in Figure 2, a one-period extension of the inspection frequency (eg from annual to biennial) would increase the relative risk (by extrapolating the solid line forward) by an average of x per week (or by y per week for a two-period extension).

(b) Projecting the counterfactual number of crashes for each vehicle group up to 2055. This involves taking the average annual number of non-inspection related crashes (by severity) for the three years to 2024 and:

  (i) scaling them for changes in average VKT over time, and

  (ii) adjusting them for baseline safety improvements, assumed to vary between 1% and 2% per annum.

(c) Applying the risk change to the projected counterfactual crashes to estimate the additional crashes from the risk change under the policy options.

Table 6 shows the average annual number of injury crashes, by severity and vehicle group, for the actual and projected periods – both under the baseline scenario (no policy) and with the increase from the policy. It also shows the average annal crashes for the years 2027 and 2055 both with and without the increase from the policy after adjusting for VKT and general road safety improvements.

[7] Annex 4 shows the different components of the social costs and their share of the average cost per crash (Ministry of Transport Te Manatū Waka, 2025).

Table 6. Average injury crashes per year by severity and vehicle group for historical years (2021-24) and projected years (2027-2055) after adjusting for VKT and road safety improvements

	Historical average (2021 to 2024)			Projected (2027 to 2055) Baseline average			Projected (2027 to 2055) With policy average		
	Fatal	Serious	Minor	Fatal	Serious	Minor	Fatal	Serious	Minor
4yrs	1.1	6.8	38.0	0.8 to 0.9	5.1 to 5.9	28.1 to 32.9	0.8 to 1.0	5.1 to 6.4	28.3 to 35.4
4_10yrs	25.8	166.8	998.5	21.5 to 25.1	138.9 to 162.8	831.9 to 974.6	21.5 to 25.5	138.9 to 165.4	831.9 to 990.2
10_14yrs	21.0	171.5	1038.5	20.4 to 23.9	167.0 to 195.0	1011.3 to 1180.6	20.5 to 24.6	167.8 to 200.5	1016.1 to 1214.3
Pre2000	24.5	112.3	533.8	8.0 to 8.4	36.7 to 38.6	174.5 to 183.3	8.0 to 8.5	36.7 to 39.0	174.5 to 185.4
Rental <5yrs	3.7	12.5	53.3	3.0 to 3.5	10.2 to 12.0	43.6 to 51.2	3.0 to 3.7	10.2 to 12.5	43.6 to 53.2
Rental >5 yrs	2.3	11.8	42.8	2.8 to 3.3	14.4 to 17.0	52.3 to 62.0	2.8 to 3.4	14.4 to 17.7	52.3 to 64.4

3.1.2 Estimating the increase in social costs

We convert the change in injury crash estimates between the policy and the counterfactual scenarios to dollar terms using the average social cost per reported crash (by severity), in June 2024 dollars (see Table 3). As this analysis did not distinguish by location or road type, we used the general average social costs for all roads.

The average social cost per reported crash includes adjustments for the estimated level of unreported crashes[8] so that we can account for the social costs of those crashes without needing to explicitly model them in this analysis. (Ministry of Transport Te Manatū Waka, 2025).

3.2 Monetised benefits

The monetised economic benefits of this policy are the reduced compliance costs from fewer inspections. These include the:

(a) avoidable cost of vehicle inspection

(b) avoidable time cost of obtaining vehicle inspection

(c) avoidable repair costs

3.2.1 Estimating the reduction in inspections and compliance time

The inspection numbers under the counterfactual are the product of the number of vehicles in each vehicle group and their current inspection frequency. This means the inspection numbers will equal the number of vehicles for the vehicle groups on annual frequencies (*≤4yrs*, *4_10yrs* and *10_14yrs*), and twice the number of vehicles for the vehicle groups on biannual frequencies (*Pre2000*, *Rental<5yrs*, *Rental≥5yrs*).

We estimate the number of inspections under the policy options by multiplying the vehicle numbers in each year by their new inspection frequencies. We then take the difference between the policy and counterfactual inspection numbers to get the reduction in inspections. Table 7 shows the multipliers used for this approach.

This assumes that inspections will be evenly distributed over time under the policy changes. Hypothetically if all vehicles aged 4 to 10 years have their last inspection in 2027, then most of that vehicle group will not undergo another inspection until 2029. This would create alternating busy and quiet years in the short term, though this will likely be smoothed out in the longer-term as vehicles shift between vehicle groups, enter the fleet or people lagging in getting their vehicle licences.

[8] This adjustment differs from the undercounting of inspection-identifiable defects by Police as that is for reported crash investigations, whereas the unreported crash adjustment is to account for crashes that are not reported to Police.

While the policy team considered phasing in implementation to ease industry uncertainty, we did not analyse its effect due to lack of details. This approach would minimally affect CBA results, mainly changing the timing of effects. Therefore, we use a straightforward method with multipliers for this analysis.

Table 7. Multipliers for estimating annual inspections

Frequency	Counterfactual	Policy
At 3 years	1	0
Annual	1	0.5
Biannual	2	1

The reduced compliance time (in hours) was estimated by multiplying the estimated time per inspection by the change in inspection numbers. Different compliance times were assumed for different inspection types: WOF (*≤4yrs*, *4_10yrs*, *10_14yrs* and *Pre2000*) or COF (*Rental<5yrs* and *Rental≥5yrs*), as indicated in Table 3.

3.2.2 Estimating the savings from fewer inspections

We estimated the avoidable costs of vehicle inspection by multiplying the change in the number of inspections by the corresponding inspection fees (WOF for *≤4yrs*, *4_10yrs*, *10_14yrs* and *Pre2000*) and COF for *Rental<5yrs* and *Rental≥5yrs*). The inspection fees were based on anecdotal evidence of WOF and COF costs using google searches.

We monetised compliance time savings by multiplying the change in compliance time by the Value of Travel Time (NZ Transport Agency Waka Kotahi, 2025)The sensitivity analysis also tested value of time in Treasury's CBAx model[9], but the difference is less than $2 per hour, so it is unlikely to affect the results.

Avoidable repair costs that a small proportion of repairs might have been undertaken prematurely or beyond the inspection requirements (for whatever reasons) (Allison, Leung, & Parker, 2012). These were estimated by assuming a proportion of average annual repair costs that could be avoided for each vehicle group and multiplying these by the number of inspections at regular mechanic garages (80% as shown in Table 3). The average annual repair costs are from the Domestic Transport Costs and Charges (DTCC) working paper on vehicle ownership costs (Paling, 2023), adjusted to 2024 prices. The proportions for unnecessary repair costs come from those used in the 2012 VLR analysis (Allison, Leung, & Parker, 2012).

We then multiply this cost estimate by the number of inspections at regular mechanic garages. These were estimated by assuming regular mechanic garages conduct 80% of all inspections[10] (Allison, Leung, & Parker, 2012).

[9] Source: Treasury's CBAx model (The Treasury Te Tai Ōhanga, 2025)
[10] With the remaining 20% assumed to be conducted at Transport Service Delivery Agents (TSDAs) - ie AA and VTNZ.

3.3 Probabilistic simulation

To test how varying some inputs affects the results, we conducted a Monte Carlo simulation that runs the CBA model 10,000 times with randomised inputs in Table 8. This approach captures most possible input value combinations, rather than requiring the explicit definition and modelling of each specific combination.

3.3.1 Inputs varied in the Monte Carlo simulations

Table 8 shows which inputs were varied in the Monte Carlo simulation. The chart name column shows the model names used in Annex 7. It also shows the vehicle groups and options each input affects.

The values are fitted to a Programme Evaluation Review Technique (PERT) probability distribution, a continuous probability distribution commonly used in risk analysis and simulations. The minimum and maximum reflect the least to most optimistic possible values while the mode is the most likely value. Each iteration will randomly select a value for each input within their own distributions.

The risk change inputs are relative risk ratio coefficients from the safety risk analysis.

Table 8. Input values for the Monte Carlo analysis

Input	Chart name	Affects	Values		
			Min	Mode	Max
Baseline annual safety improvements (% decrease/year)	safety_improv	All vehicle groups and options	1.0%	1.5%	2.0%
Under-recording of defects	vcf_underrec	All vehicle groups and options	0	0.3	1
≤4yrs relative risk ratio	4_risk_change	≤4yrs – both options	0.0002	0.0007	0.0012
4_10yrs relative risk ratio	4_10_risk_change	4_10yrs – both options	0.0000	0.0001	0.0002
10_14yrs relative risk ratio	10_14_risk_change	10_14yrs – Option 2	0.0001	0.0002	0.0003
Pre2000 relative risk ratio	pre2000_risk_change	Pre2000 – both options	0.0000	0.0002	0.0006
Rental relative risk ratio	rental_risk_change	Rental<5yrs and Rental≥5yrs – both options	0.0000	0.0008	0.0016
WOF inspection costs ($/inspection)	wof_inspection_fee	≤4yrs, 4_10yrs, 10_14yrs and Pre2000 – both options	$50.00	$72.50	$95.00
COF inspection costs ($/inspection)	cof_inspection_fee	Rental<5yrs and Rental≥5yrs – both options	$150.00	$175.00	$200.00
WOF inspection time (minutes/inspection)	wof_inspection_time	≤4yrs, 4_10yrs, 10_14yrs and Pre2000 – both options	30	45	60
COF inspection time (minutes/inspection)	cof_inspection_time	Rental<5yrs and Rental≥5yrs – both options	60	90	120
Value of time ($/hour)	time_cost_per_hour	All vehicle groups and options	$33.00	$33.98	$34.96
≤4yrs annual repair costs ($/inspection)	age_4_repair_cost	*≤4yrs* – both options	$260.87	$391.30	$521.74
4_14yrs annual repair costs ($/inspection)	age_4_14_repair_cost	*4_10yrs* and *10_14yrs* – both options	$521.74	$652.17	$782.61
Pre2000s annual repair costs ($/inspection)	pre2000_repair_cost	*Pre2000* – both options	$782.61	$913.04	$1043.48
Rental repair cost ($/inspection)	rental_repair_cost	Rental<5yrs and Rental≥5yrs – both options	$695.65	$782.61	$869.57
Unnecessary repair cost proportion (%/repair cost)	share_of_repair_avoided	All vehicle groups and options	0%	5%	10%

3.4 Cost-Benefit Analysis

A social CBA provides a structured way to compare the economic benefits and costs of a proposed intervention. This helps decision-makers to identify the most efficient options (in terms of outputs produced relative to inputs) and allocate resources to areas with the greatest net benefit.

This CBA compares two policy options to the status quo to determine whether they would provide net incremental benefits to the nation.

3.4.1 CBA reporting matrices

We report two main CBA measures: the Benefit-Cost Ratio (BCR) and the Net Present Value (NPV). BCR is the present value benefits divided by the present value costs. The NPV is the present value benefits minus the present value costs. A BCR over 1 and a NPV greater than 0 both indicate net benefit.

BCR compares the relative effectiveness of different options while the NPV shows their total net benefit to society. The NPVs are sensitive to the size of the vehicle groups but they do not show the relationship between costs and benefits. In addition, NPVs can vary greatly with the choice of discount rate, whereas the BCRs tend to be more stable across different discount rates.

We have also estimated the average annual net benefit per vehicle affected to show the scale of the net benefits relative to the number of vehicles affected.

3.4.2 CBA results

The estimated policy effects are summarised in Table 9 and Table 10, which shows the 95% confidence interval for each effect in a Monte Carlo simulation as totals for the years 2027 to 2055. The numbers do not sum to the totals as each range is generated from running the model 10,000 times with randomised inputs (see Table 8) to derive the confidence interval estimates

Table 9 shows the effects of the policy on the numbers of crashes and inspections, and compliance time for each vehicle group, along with the combined effects for the two options. To reiterate from Table 1, the policy packages are:

(a) option 1 includes the *≤4yrs*, *4_10yrs*, *Pre2000* and *Rental<5yrs* vehicle groups

(b) option 2 includes the *10_14yrs* and *Rental≥5yrs* vehicle groups on top of the option 1 vehicle groups.

- Being the largest vehicle groups, *4_10yrs* provides the largest reduction in the number of inspections and compliance time, followed by *10_14yrs (second largest vehicle groups)*. However, the safety implications for *10_14yrs* are significantly higher than all other vehicle groups and are the main driver for the significant increase in crash estimates from *Option 1* to *Option 2*. This is because the *10_14yrs* vehicle group having the highest relative risk ratio (see Table 5).

Table 10 shows the monetised effects along with the BCRs, NPVs and net benefit per vehicle. These estimates were discounted to present value terms using Treasury's Stated Time Preference (SRTP) discount rate of 2%[11].

Reduced costs of inspection fees account for the largest proportion of benefits, which reflects a reduction in resources (such as labour) allocated to inspections that could be allocated elsewhere. There will be business and staff effects on WOF/COF agents as a result. However, such effects are counted as transfers in CBA and therefore are not included in the assessment of NPVs or BCRs. *Section 3.5.2* includes a high-level estimation of the potential industry effect for completeness.

[11] As an additional sensitivity test Annex 4 provides the estimates using Treasury's Social Opportunity Cost of Capital (SOC) discount rate of 8%.

Table 9. Inspection and crash changes by vehicle group and option as a result of the policy - cumulative totals for the years 2027 to 2055)

Effects		≤4yrs	4_10yrs	10_14yrs	Pre2000	Rental<5yrs	Rental≥5yrs	Option 1	Option 2
Reduced compliance burden	**Inspections (m)**	5	16	13	3	1	1	***25***	***39***
	Time (m hours)	3 to 5	9 to 15	7 to 12	1 to 2	2 to 3	1 to 2	***16 to 24***	***25 to 38***
Increased number of crashes	**Fatal**	0 to 1	1 to 7	5 to 13	0 to 1	0 to 2	0 to 2	***3 to 10***	***11 to 24***
	Serious	3 to 8	7 to 46	44 to 109	0 to 4	1 to 8	2 to 12	***17 to 60***	***74 to 166***
	Minor	15 to 47	41 to 276	264 to 568	2 to 17	5 to 35	3 to 19	***92 to 345***	***429 to 964***

Table 10. Monetised policy effects by vehicle group - cumulative total for the years 2027 to 2055 (all dollar values are discounted at a 2% rate)

Effects		≤4yrs	4_10yrs	10_14yrs	Pre2000	Rental<5yrs	Rental≥5yrs	Option 1	Option 2
Benefits ($m)	Reduced inspection costs	220 to 342	656 to 1018	527 to 817	129 to 200	169 to 207	136 to 167	**1192 to 1748**	**1867 to 2718**
	Compliance time savings	76 to 123	226 to 365	181 to 293	44 to 72	42 to 68	34 to 55	**399 to 616**	**623 to 954**
	Avoidable repairs	27 to 114	138 to 536	110 to 430	38 to 145	15 to 59	12 to 47	**220 to 841**	**343 to 1319**
	Total benefits	**367 to 529**	**1182 to 1751**	**949 to 1406**	**247 to 313**	**247 to 313**	**199 to 252**	**2064 to 2954**	**3226 to 4600**
Costs ($m)	Fatal crashes	5 to 17	14 to 90	68 to 171	1 to 12	5 to 30	4 to 28	**41 to 132**	**137 to 301**
	Serious crashes	4 to 11	9 to 61	59 to 146	1 to 6	2 to11	2 to 15	**23 to 81**	**100 to 222**
	Minor crashes	4 to 12	11 to 72	69 to 173	1 to 5	1 to 9	2 to 11	**24 to 90**	**113 to 253**
	Total costs	**13 to 40**	**34 to 223**	**196 to 490**	**3 to 24**	**8 to 50**	**8 to 54**	**89 to 302**	**351 to 776**
NPV ($m)		***341 to 505***	***1042 to 1652***	***568 to 1122***	***234 to 372***	***213 to 291***	***160 to 230***	***1864 to 2786***	***2644 to 4101***
Net benefit per vehicle ($/year)		***60 to 89***	***31 to 49***	***21 to 42***	***69 to 110***	***136 to 186***	***127 to 182***	***42 to 63***	***37 to 57***
BCR		***10.6 to 35.9***	***6.3 to 44.7***	***2.3 to 6.2***	***12.7 to 116.7***	***5.5 to 37.2***	***4.1 to 27.8***	***8.0 to 29.0***	***4.8 to 11.6***

Avoidable repairs tend to be the smallest economic benefit at the lower end of its range and the second largest economic benefit at the higher end of its range. This reflects a greater uncertainty in the inputs used to estimate this benefit (see Table 8).

The social cost of fatal crashes accounts for the highest proportion of monetised safety effects. This is due to the high average social cost per reported fatal crash (Annex 4), 99% of it representing the grief and trauma caused by the loss of lives (Ministry of Transport Te Manatū Waka, 2025). We estimated the potential increase in fatal crashes over a 30-year period to be small (see Table 6 and Table 9).

The sole exception to this is the *10_14yrs* vehicle group where the increase in the social costs of minor injury crashes is similar in quantum to the social cost of fatal crashes for this vehicle group. This reflects how minor injury crashes account for a higher proportion of average annual crashes for the *10_14yrs* vehicle group compared to the other vehicle groups (see Table 6).

Annex 6 shows the result distributions from all 10,000 Monte Carlo iterations for the BCRs and NPVs. Each iteration represents a different combination of the variable inputs in Table 8. The distributions show that all iterations deliver net benefits to society. The BCRs tend to skew to the lower end of the distribution with long tails for some vehicle groups indicating that the true BCR is more likely to land at the lower end of the range while the NPVs tend to be more normally distributed indicating that the NPV is most likely to be in the middle of the range.

Annex 7 shows the extent to which the inputs in Table 8 affect the BCR results in each option. The inputs with the largest effects on the results across both options tend to be those where there is a significant degree of uncertainty and/or affect the larger vehicle groups. Table 11 highlights the inputs with the top five largest effects for each option.

Table 11. Top 5 inputs with the largest effect on model results by option

Effect size ranking	Option 1	Option 2
1	Relative risk increase for 4_10yrs	Under-recording of defects in reported crashes
2	Under-recording of defects in reported crashes	Relative risk increase for 10_14yrs
3	Relative risk increase for rental vehicles	Relative risk increase for 4_10yrs
4	Proportion of annual repair costs that are avoidable	
5	WOF inspection fees	

3.4.3 Implications for policy

Results suggest that all **vehicle groups and accordingly both policy options would deliver net incremental benefits to society** relative to the status quo. The wide ranges of the results are due to the uncertainties outlined earlier, including:

(a) the less precise relative risk estimates for *Pre2000* vehicles and for *Rental≥5yrs*

(b) our inability to determine the relative risk for *Rental<5yrs* due to the extremely low number of related historic crashes.

We consider related **uncertainties for vehicle groups *Pre2000*, *Rental<5yrs* and *Rental≥5yrs* are unlikely to affect the overall conclusion** of the analysis as:

(a) there is a small number of relevant crashes for these vehicle groups which suggests the relative safety risk was low

(b) the size of the affected vehicle groups is relatively small, so the scale of the safety effects is small we expect both the fleet size and level of travel (see Figure 4 and Figure 5)

The relativities between the costs and benefits vary significantly between each vehicle group according to their vehicle group size and relative risks. These are reflected in the results for the combined options.

Option 2 has the higher NPV compared to *Option 1* because it includes more vehicle groups. However, ***Option 2* also has the lower BCR and average net benefit per vehicle as those additional vehicle groups have a higher increase in safety risk**. Vehicle group *10_14yrs* is the main driver of the results for *Option 2, as* it is the second largest vehicle group and has the highest safety risk increase from the proposed policy.

As BCR is more stable between discount rates, it is more reflective of the relative costs and benefits for an individual vehicle.

3.5 Other quantified effects

There are several other policy effects not included in the CBA results. This is because:

a) the effect does not reflect a change in economic resources that have not already been captured by the CBA and/or,

b) the effect was not quantified due to limitations on time and data.

3.5.1 Changes in WOF/COF label revenue for NZTA

The NZ Transport Agency charges a fee of $4.16 per inspection for WOF/COF labels to recover the administrative costs of providing them. Reducing the number of inspections will reduce the revenue that the NZ Transport Agency collects from the label fees.

As this fee is charged for cost recovery purposes, it is not included in the CBA as an economic effect. It is instead a financial transfer. Table 12 shows the total estimated revenue loss by vehicle group and option in nominal and discounted terms. Annex 8 shows the revenue loss in nominal terms over time.

Table 12. Total label revenue foregone ($m) nominal and discounted (at a 2% rate)

	Nominal ($m)	Discounted ($m)
≤4yrs	21.9	16.4
4_10yrs	65.4	48.1
10_14yrs	52.4	38.6
Pre2000	10.6	9.4
Rental<5yrs	6.2	4.6
Rental≥5yrs	5.0	3.5
Option 1 total	***104.2***	***78.0***
Option 2 total	***161.7***	***120.7***

The loss is greatest within the first 10 years of implementation because of the *Pre2000*s vehicle group which is currently on a biannual inspection frequency. As this vehicle group is projected to reduce significantly over time, the potential revenue loss diminishes until 2040 when the vehicle group is gone. After this the revenue loss grows steadily due to continued growth in the other vehicle groups.

3.5.2 Effects on motor repairs industry

This section provides an indication of how the policy changes might affect industry employment and revenue to support the completion of the Regulatory Impact Assessment.

We have replicated the simple approach adopted in the VLR 2014 analysis, with updated inputs and simplified workings.

The estimates rely on several assumptions:

(a) the proportion of vehicle inspections requiring a re-test, ie, for those that did not pass the first time (based on the VLR 2014 analysis)

(b) the proportion of vehicles to have a basic safety check at the lower inspection frequency (based on the VLR 2014 analysis)

(c) the time that providers spend on first and re-test inspections as well as on providing basic vehicle services (in hours, based on the VLR 2014 analysis)

(d) the total annual FTE hours for each inspector being 1,800 hours with 70% productive time

(e) the charges for WOF inspections and basic service fees.

As there is a high-level of uncertainty with these assumptions, our estimates only aim to provide a high-level sense of the relative magnitude of the effects between options.

Table 13, Table 14 and Table 15 below provide the estimated effect on a single example year and are based on 2024 fleet numbers and revenue in $2024 terms.

Table 13. Changes to annual number of inspections (based on 2024 volume)

Scenario	Number of Inspections pa	Change	% Change
Base	4,704,821		
Option 1	3,547,496	-1,157,325	-25%
Option 2	3,195,855	-1,508,967	-32%

Table 14. Changes to industry employment (Full time equivalent compared to baseline)

	Effects on industry employment	
Scenario	Low safety check uptake	High safety check uptake
Option 1	-540	-505
Option 2	-703	-659

Table 15. Changes to industry annual revenue ($m compared to baseline)

	Effects on industry annual revenue ($m)	
Scenario	Low safety check uptake	High safety check uptake
Option 1	-$76	-$64
Option 2	-$98	-$84

3.6 Non-quantified effects

There are several policy effects that we have identified but not quantified. Most of these effects will be small in scale so their exclusion will not change the conclusions of the quantitative results. They were not quantified either because of a lack of data and evidence or because doing so would require substantive effort and assumptions relative to the effect.

3.6.1 Non-quantified economic effects

Implementation costs

There will be likely some expenditure from the NZ Transport Agency for the implementation of this policy (eg communications or educational materials). These will depend on the specific implementation options for the changes, which are still being worked through.

Change in justice system resource costs

An effective WOF/COF system requires appropriate administration and ongoing enforcement efforts. Police and local authorities can issue infringements to vehicles for not possessing a valid licence (ie non-compliance). They can also issue infringements to complying vehicles that have developed defects. The Courts and Corrections may also be required to take actions to settle the fines that were issued for some infringements (Allison, Leung, & Parker, 2012). This resource allocation has a social cost as those resources could otherwise be allocated to other activities[12].

The 2012 VLR CBA modelled a reduction in justice system resource costs, assuming the greater time between inspections led to fewer enforcement and fine collection activities. The benefits from these resource savings were relatively immaterial (Allison, Leung, & Parker, 2012).

Despite this, the number of infringements issued could also increase if:

(a) there is increased enforcement activity to mitigate the safety effects of the policy (Allison, Leung, & Parker, 2012) and/or,

(b) there is an increased number of defects being detected by Police and Local authorities

If both effects are large enough, they could result in a net increase to the justice system costs. Due to this uncertainty, lack of data and the small scale, we have not modelled these effects.

Environmental and pollution costs

In addition to safety harms, WOF/COF tests reduce several following social and environmental harms. Vehicle exhaust tests can reduce greenhouse gases, air pollution and noise pollution. Tyre checks reduce air pollution (specifically particulate matters) and run-off from roads.

Reducing the frequency of inspections means exhausts and tyres may deteriorate more before remediation, increasing the associated harms from:

- greenhouse gases - contribute to climate change related harms such as more frequent extreme weather events (Kuschel, 2023)
- air pollution - harms human health via increasing respiratory and cardiovascular diseases, restricting activity and causing premature death (Kuschel, 2023)
- noise pollution - harms human health and wellbeing via causing sleep disturbance and annoyance (Altissimo Consulting Ltd, 2023) and,
- run-off from roads (from tyre wear) - harms aquatic ecosystems via discharging zinc pollutants into waterways (Miskell, 2023).

The 2012 VLR CBA investigated the potential increase in the social costs of greenhouse gases and air pollution from the delayed vehicle exhaust test, which is currently a smoke assessment. However, they found no correlation between exhaust smoke and the most harmful air pollutants and that the social harms from this would likely be minimal (Allison, Leung, & Parker, 2012).

[12] Though the identification of WOF/COF non-compliance will be bundled with other enforcement activities to some extent.

Similarly, it is not clear to what extent the vehicle exhaust tests would reduce climate emissions and noise pollution or the extent the tyre tests would reduce particulate matter and zinc pollutants. We did not model these effects due to those limitations.

3.6.2 Non-quantified financial effects

Fine revenue

The infringements that Police and local authorities issue also collect revenue in the form of fines. These fines are a financial penalty designed to incentivise compliance with the vehicle licencing regime. This means they do not represent the use of economic resources nor recover a resource costs; they are instead a financial transfer.

Reducing the number of infringements issued means the revenue collected from the fines also reduces. This foregone revenue has no effect on the CBA results as that does not count transfer effects. However, it may have financial implications for the affected organisations.

Goods and Services Tax (GST) revenue

GST revenue is a value-add tax of 15% onto all goods and services sold in NZ. This includes inspection fees and spending on repairs. As tax revenue is a financial transfer, it is excluded from those costs in the CBA.

Reducing the number of inspections and avoidable repairs means some reduction in the GST collected on those services, which means lower Crown revenue. However, this will partly be offset by vehicle owners spending some of the money they save (from fewer inspections and avoidable repairs) on other goods and services. For that reason, this policy effect would be very small.

Road User Charges compliance and revenue

WOF/COF inspections also help the NZ Transport Agency with RUC compliance by identifying discrepancies between odometer readings and RUC labels. Increasing the time between inspections may affect the NZ Transport Agency's ability to identify these discrepancies and the revenue they recover.

It is uncertain how these policy changes will affect the level of RUC non-compliance. The level could stay the same but simply be delayed till the next inspection or some additional non-compliance may be induced. This is further complicated by the ongoing modernisation of the RUC system (Ministry of Transport Te Manatū Waka, 2026), which may reduce reliance on the WOF/COF system for RUC compliance.

4 Limitations

The following exclusions may overstate the safety effects.

The analysis did not adjust for inspections undertaken to buy and sell vehicles. The law requires the vehicle to have a valid WOF that is no more than one month old when the buyer takes possession. There are approximately 1 million light vehicle change of ownership applications annually. We have not adjusted for this, but it would decrease the size of the estimated safety effects (in 2012 the estimated reduction was less than 10%).

We also did not account for voluntary maintenance that still occur without an upcoming inspection. Under a less frequent inspection regime, safety conscious car owners could continue to get their vehicles inspected and repaired during the period when an inspection is not required. This would decrease the size of the estimated safety effects (in 2012 the estimated reduction was between 26% and 28%).

We assume a WOF/COF inspection will correctly identify relevant vehicle faults and require them to be addressed before a vehicle can pass. This resets the safety risk of those vehicle faults to a baseline risk. However, some defects may be difficult to identify or not present until after the inspection. If this were the case, we are likely to overstate the effects of inspection in resetting the safety risk. We have not adjusted for any instances where this may have occurred, though the effects of some instances may be present in the CAS data, which would affect the safety risk analysis.

The relative risk analysis assumes that the presence of an inspection-identifiable contributing factor leads to an increased risk of a crash. However, a crash can have multiple contributing factors, and the inspection-identifiable ones may not necessarily be the primary cause of the crash. This implies we overstate the safety effects.

The following exclusions may understate the safety effects.

Our safety analysis focussed on how the policy options affect the relative risk of a crash occurring. It did not test for the effect vehicle defects have on the severity of crashes, though it is likely that some inspection-identifiable defects do increase the severity of crashes that would have occurred regardless. For example, WOF/COF inspections check that a vehicle's seatbelts work correctly. Seatbelts are unlikely to directly reduce the risk of a crash occurring, but they do lessen the severity of crash injuries. So, an increase in seatbelt defects in crashes could result in an increase in the proportion of fatal and serious crashes. This suggests the safety effects have been understated.

Our analysis included an adjustment for the potential undercounting of inspection-identifiable defects in road crashes by Police. This adjustment used a range to reflect the uncertainty in this assumption. If the actual level of undercounting is greater than the range used, then the safety effects will be understated.

It is uncertain how the following limitations may influence the safety effects.

The vehicle fleet projections used in the model to calculate inspections are based on projections using data up to 2023. The newer fleet projections are not yet available, but this mainly affects the scale of the total net benefits and therefore will not affect the likely range of the estimated BCR.

Relative risks were calculated using a relatively small numbers of inspection-identifiable reported crashes, especially for the vehicle groups with a smaller fleet (eg Rental<5yrs and Pre2000 vehicles). Inspection related crashes only make up about 2% of total number of reported crashes (excluding non-injury and unlicenced vehicle crashes).

The average social costs per reported crash implicitly assumes an average number of injuries for each crash. The injury composition was based on an average across three years for all crashes. The specific injury composition for crashes with inspection-identifiable contributing factors may differ, though this is unlikely to affect the results significantly.

The relative risk ratios assume a linear relationship between the time since last inspection and relative risk, which is consistent with the approach used in the 2012 VLR CBA. Observations and model diagnostics (see Figure 4 and Annex 3) suggest that a non-linear relationship may be more suitable for the relative risks of some vehicle groups over time. We have not tested a non-linear relationship due to the low number of observations and it being a more complex approach to apply. It is also uncertain whether this change would materially affect the results and conclusions.

Annexes

Annex 1. Vehicle contributing factor associated with inspection-identifiable crashes

Developed based on similar lists from previous analyses and consultation with the Ministry's Insights and Analytics team and NZ Transport Agency analysts.

Vehicle contributing factor code	Contributing factor name	Include/Exclude
136	Lost control – vehicle fault	Exclude – unknown if fault is inspection related
420	Other vehicle controls	Exclude – unknown if inspection related
537	Child restrained failure/inappropriate	Exclude – child restraints are not covered by inspections
600	Other lights or reflectors	Include
602	Headlights inadequate / no headlights / failed suddenly	Include
604	Brake lights or indicators faulty or not fitted	Include
605	Tail lights inadequate or no tail lights	Include
606	Reflectors inadequate or no reflectors	Include
607	Lights or reflectors obscured	Include
609	Lights or reflectors at fault or dirty	Include
610	Other brakes	Include
611	Parking brakes failed/ defective	Include
613	Service brake failed	Include
614	Service brake defective	Include
615	Jack – knifed / uneven breaking	Exclude – sounds like it could refer more to driver behaviour
620	Other steering	Include – this might apply to the system rather than behaviour
621	Defective steering	Include
622	Steering failed suddenly	Include
630	Other tyres	Include
631	Puncture or blowout	Exclude – not something that gets to an inspection
632	Worn tread on tyre	Include
633	Incorrect tyre type	Include
634	Mixed tyre types / space savers	Include
640	Other windscreen / mirror	Include
641	Shattered windscreen	Include
643	Rear vision mirror	Include
650	Other mechanical	Include
651	Engine failure	Include
652	Transmission failure / broken axle	Include
653	Accelerator or throttle jammed	Exclude – not something that gets to an inspection
660	Other chassis / gear	Include
661	Body, chassis or frame failure	Include

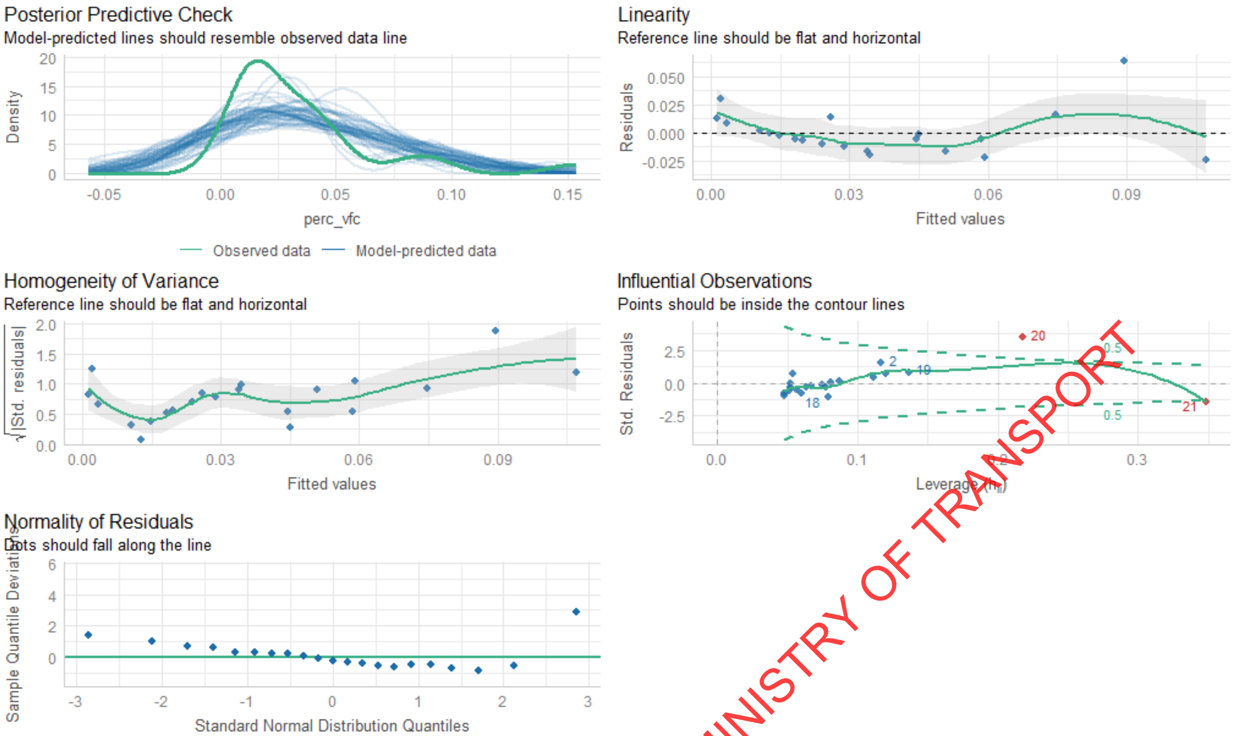
Vehicle contributing factor code	Contributing factor name	Include/Exclude
662	Suspension failure	Include
664	Other body /doors	Include
665	Inadequate tow coupling	Include
666	Inadequate or no safety chain	Include
667	Door / bonnet catch failed, defective or not shut	Include
668	Wheel off	Exclude – not something that gets to an inspection
672	Seatbelt failed / defective	Exclude – affects severity, not crash risk
673	Air bag failed / defective	Exclude – affects severity, not crash risk
697	Vehicle software failure	Exclude – not covered by inspection

Annex 2. Linear regression results for relative risk ratios with p-values and adjusted R-squared

Light vehicle group	Intercept		Coefficient		Adjusted R-squared	Degrees of freedom
	Estimate	p-value	Estimate	p-value		
Up to 4 years	0.0007	0.9330	0.0007	0.0055	0.6549	19
4 – 10 years	0.0078	0.0000	0.0001	0.0646	0.0429	45
10 – 14 years	0.0062	0.0000	0.0002	0.0002	0.2224	49
Pre-2000 (<40 years)	0.0159	0.0000	0.0002	0.1901	0.0533	26
Rental under 5 years	This vehicle group is modelled using the relative risk estimates for rental vehicles ≥ 5 years due to limited historic crash data.					
Rental over 5 years	0.0169	0.0377	0.0008	0.0561	0.8222	3

Annex 3. Model diagnostics for relative risk regression models

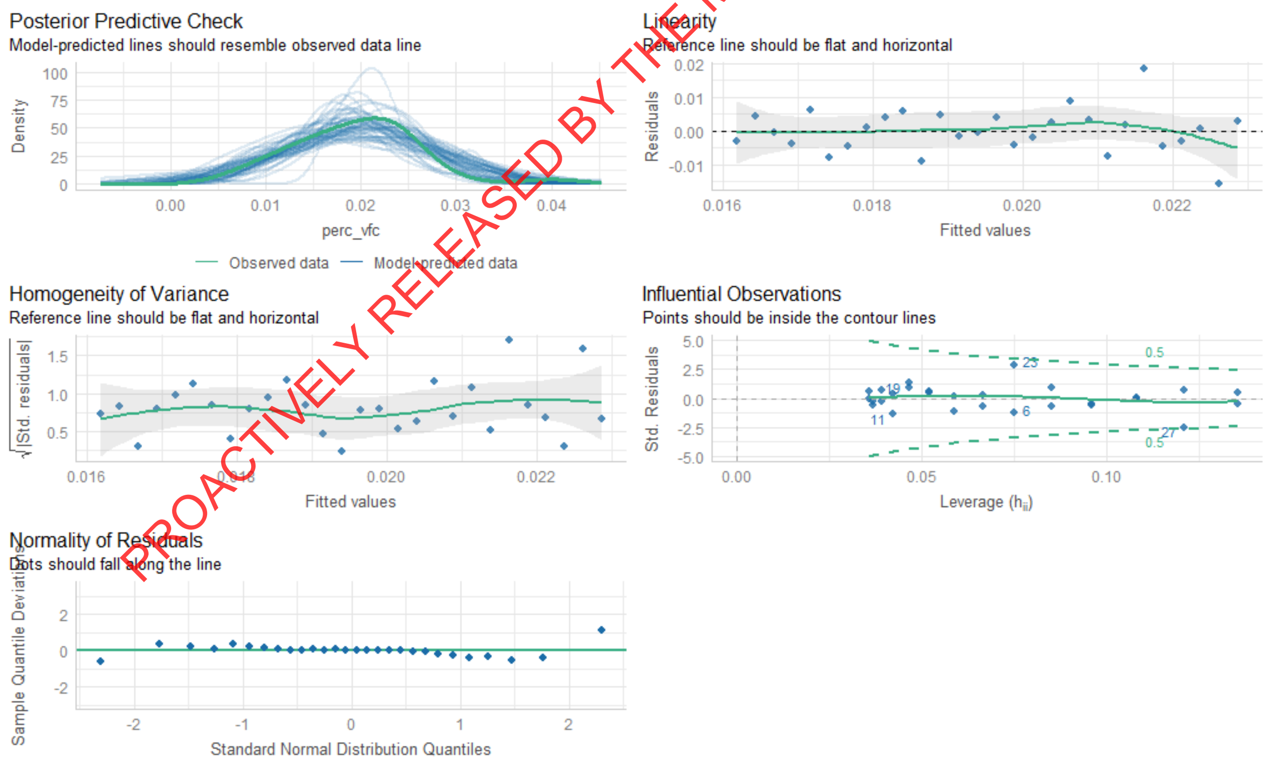
4 years



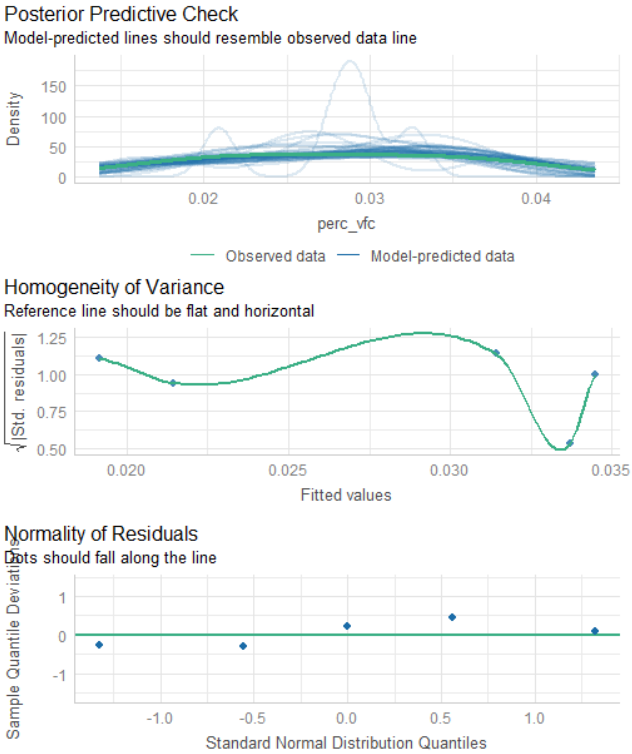
4 to 10 years

10 to 14 years

Vehicles with pre-2000 YOM, but under 40 years old



Rental vehicles aged 5 and over



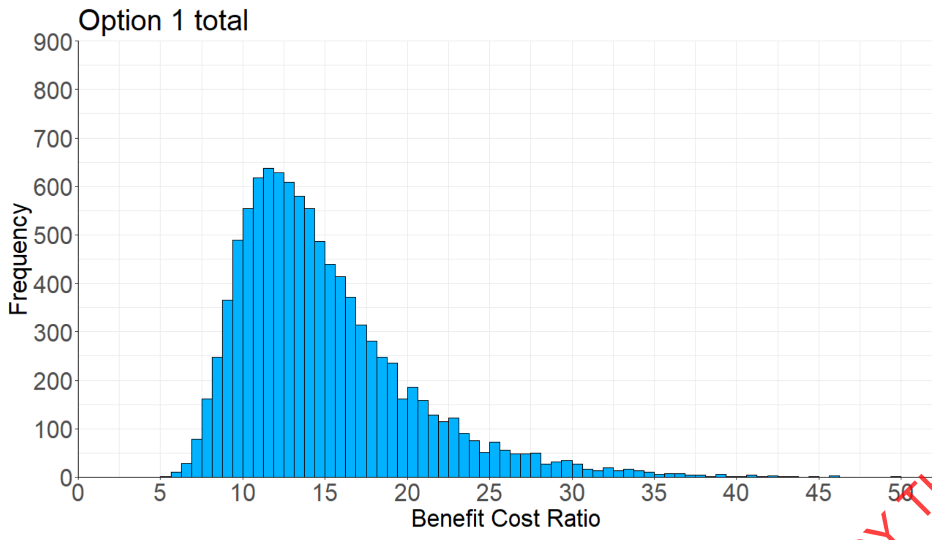
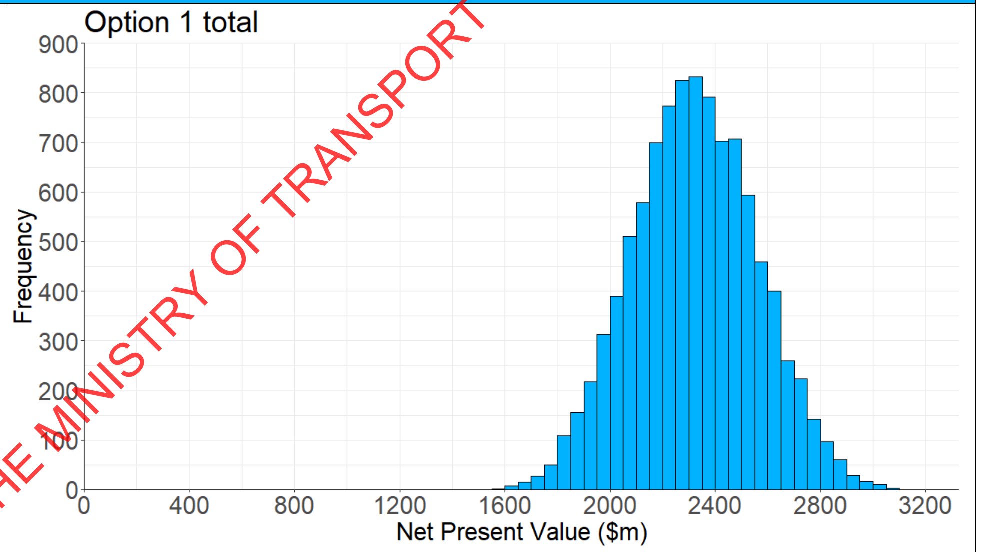
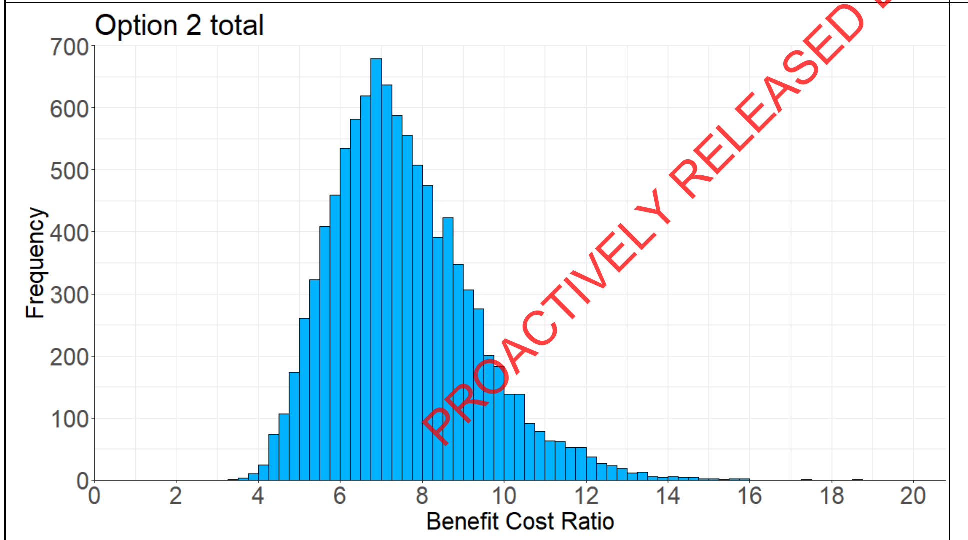
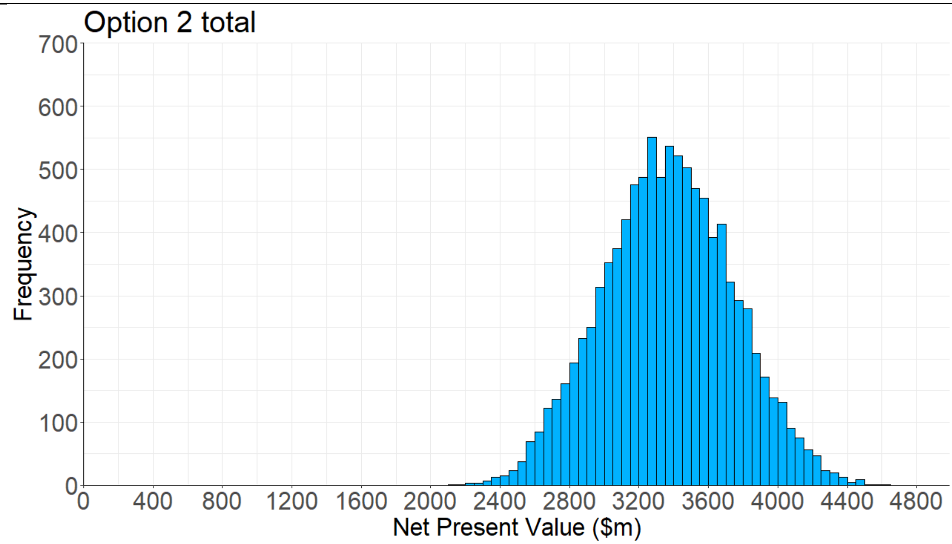
Annex 4. Component breakdown of the average social cost per reported crash

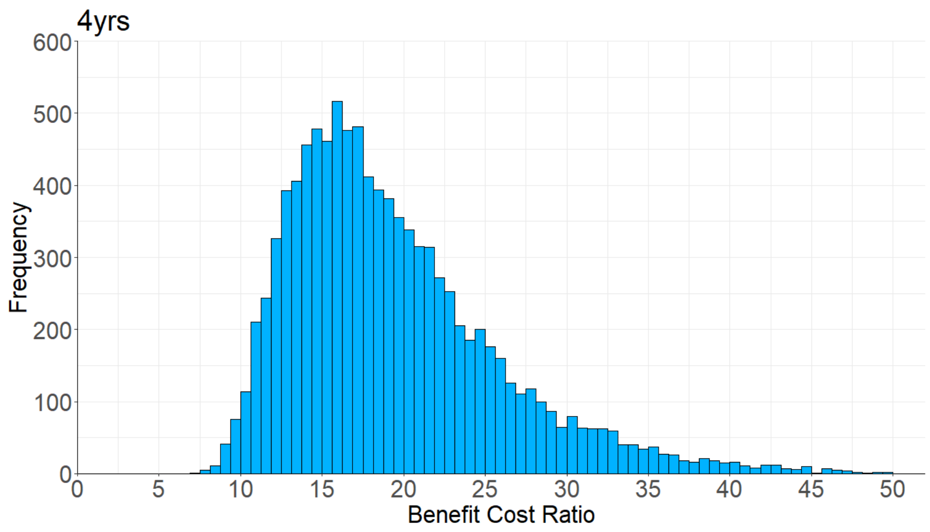
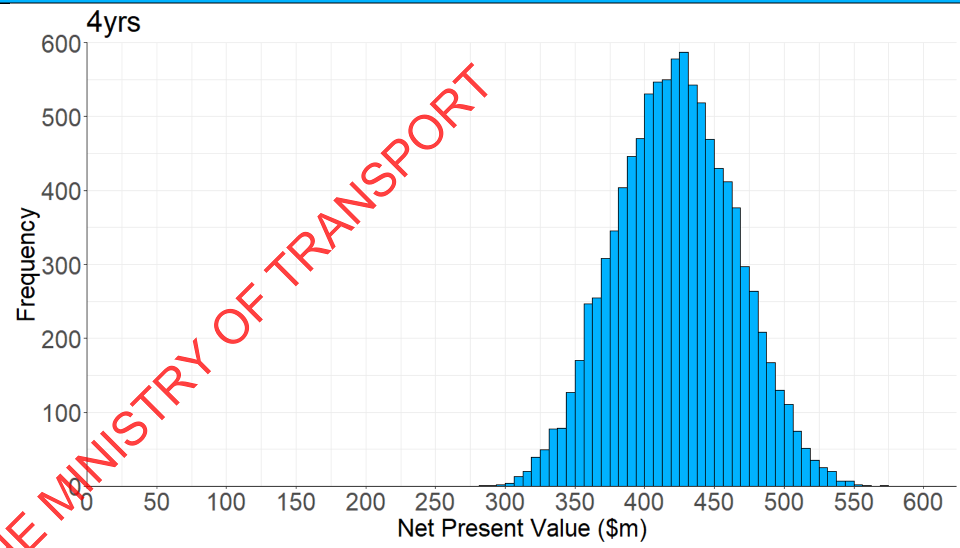
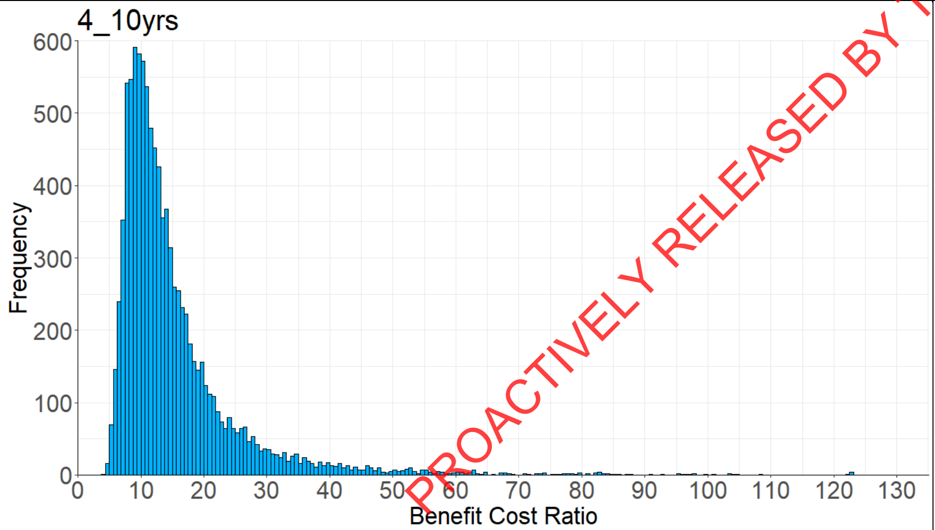
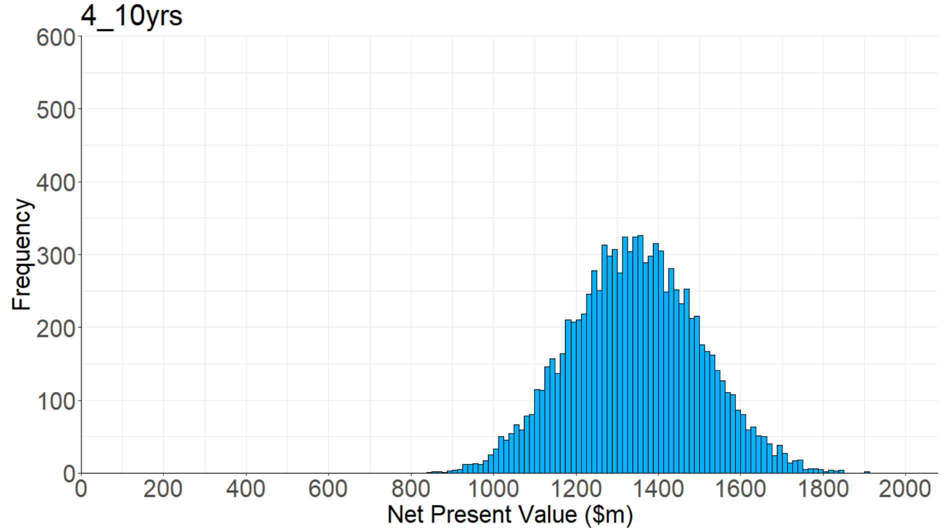
Component	Fatal crash	Serious injury crash	Minor injury crash
Loss of life / life quality share (%)	99.56%	95.83%	89.80%
Loss of output share (%)	0.01%	0.29%	0.45%
Medical resources share (%)	0.10%	2.31%	1.26%
Legal and court resources share (%)	0.24%	0.52%	1.44%
Vehicle damage and loss share (%)	0.09%	1.03%	7.13%
Average cost ($)	$17,081,200	$1,792,500	$350,800

Annex 5. Monetised effects by vehicle group (light passenger vehicles) - cumulative total for the years 2027 to 2055 (all dollar values are discounted at an 8% rate

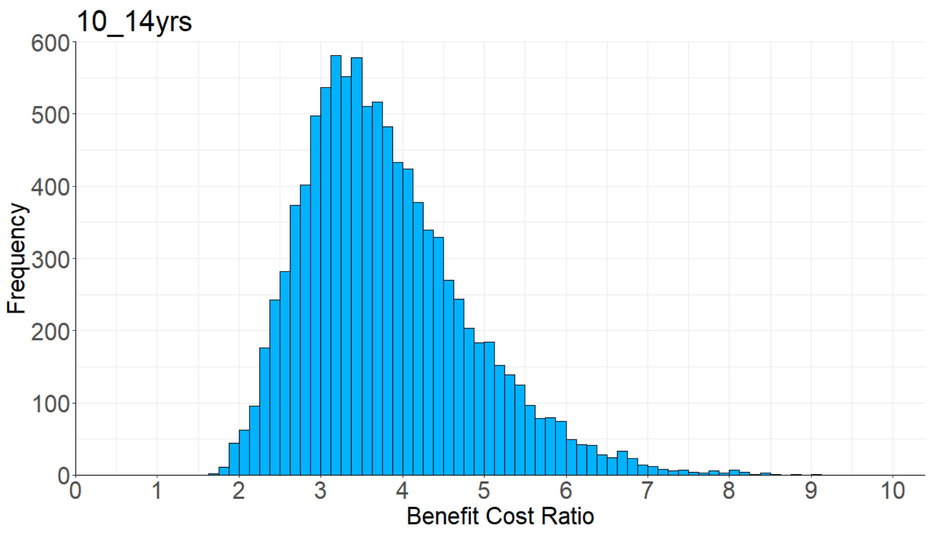
Effects		≤4yrs	4_10yrs	10_14yrs	Pre2000	Rental<5yrs	Rental≥5yrs	Option 1	Option 2
Benefits ($m)	Inspection cost	105 to 164	314 to 487	253 to 393	94 to 146	76 to 93	60 to 73	**598 to 882**	**917 to 1341**
	Compliance time	36 to 59	108 to 175	87 to 141	32 to 53	19 to 31	15 to 24	**201 to 311**	**307 to 472**
	Avoidable repairs	13 to 55	66 to 257	53 to 207	28 to 106	7 to 27	5 to 21	**114 to 437**	**173 to 664**
	Total benefits	**176 to 253**	**565 to 838**	**456 to 676**	**181 to 280**	**111 to 141**	**87 to 110**	**1043 to 1501**	**1592 to 2281**
Costs ($m)	Fatal crashes	3 to 8	7 to 44	34 to 85	1 to 9	2 to 15	2 to 13	**21 to 66**	**69 to 151**
	Serious crashes	2 to 6	5 to 30	29 to 73	1 to 4	1 to 5	1 to 7	**12 to 41**	**50 to 111**
	Minor crashes	2 to 6	5 to 35	35 to 87	0 to 4	1 to 4	1 to 5	**13 to 45**	**57 to 127**
	Total costs	**6 to 20**	**16 to 110**	**99 to 246**	**2 to 18**	**4 to 24**	**4 to 25**	**46 to 152**	**177 to 388**
NPV ($m)		***163 to 241***	***497 to 789***	***265 to 534***	***171 to 272***	***95 to 131***	***69 to 100***	***942 to 1416***	***1302 to 2032***
Net benefit per vehicle ($/year)		***29 to 43***	***15 to 24***	***10 to 20***	***50 to 80***	***60 to 83***	***55 to 79***	***21 to 32***	***18 to 28***
BCR		***10.3 to 34.8***	***6.2 to 43.3***	***2.2 to 5.9***	***12.3 to 113.4***	***5.1 to 34.4***	***3.9 to 26.0***	***8.1 to 28.3***	***4.7 to 11.4***

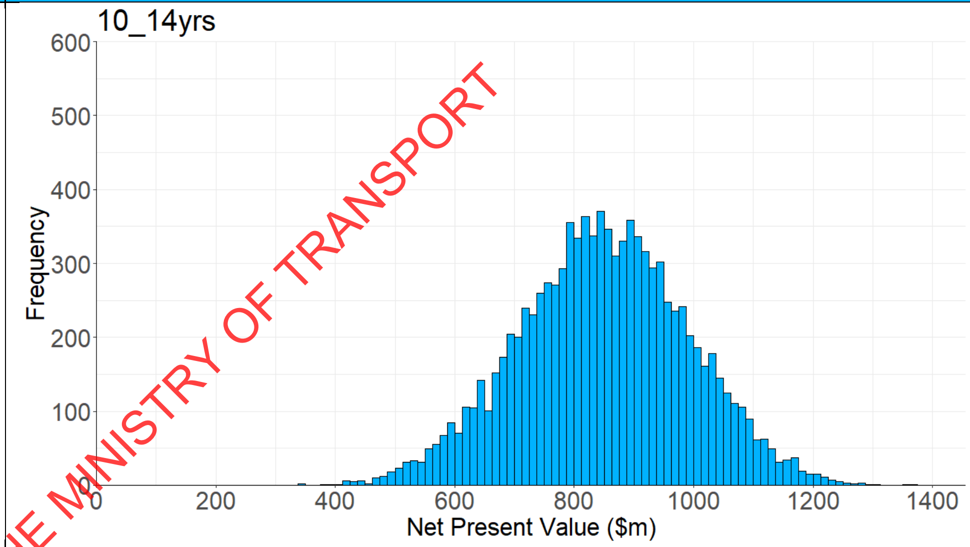
Annex 6. Distribution graphs of CBA outputs

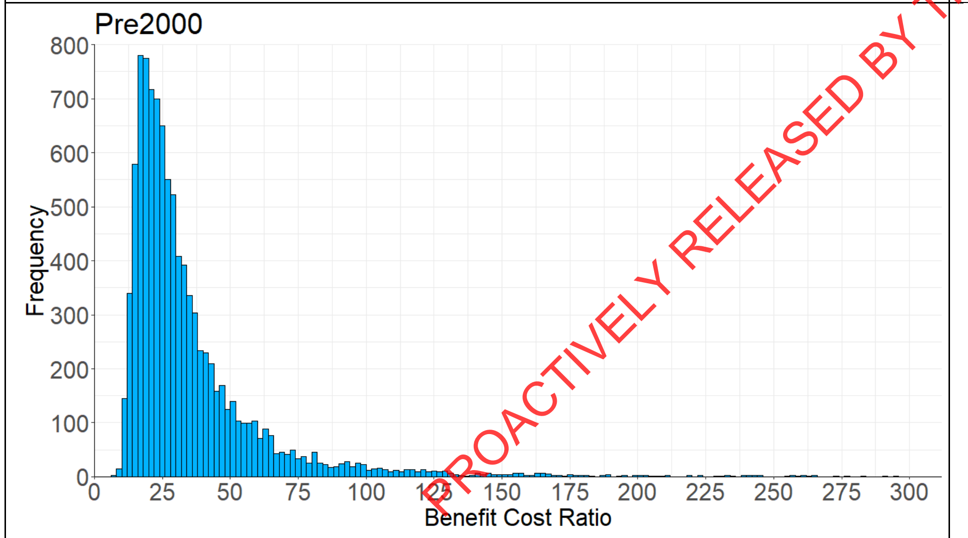
Benefit Cost Ratio	Net Present Value
	
	

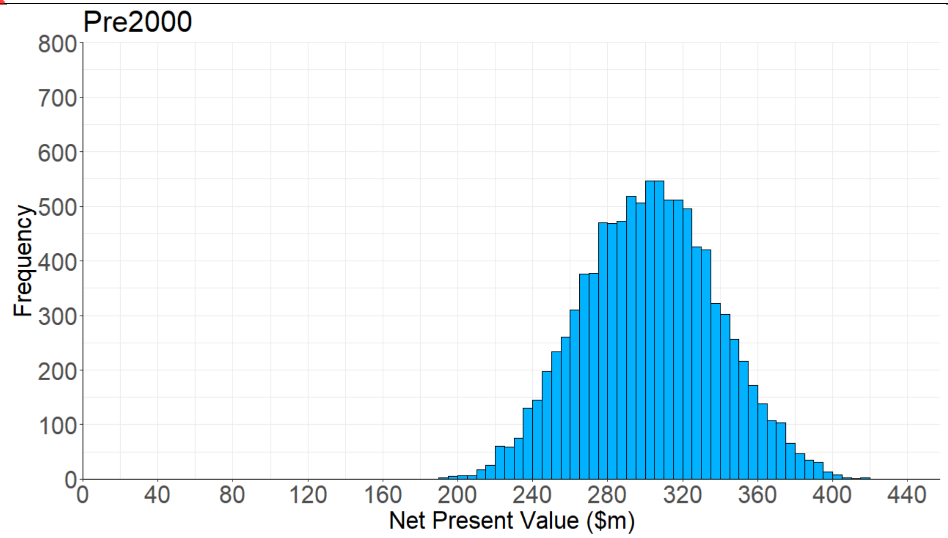
Benefit Cost Ratio	Net Present Value
	
	

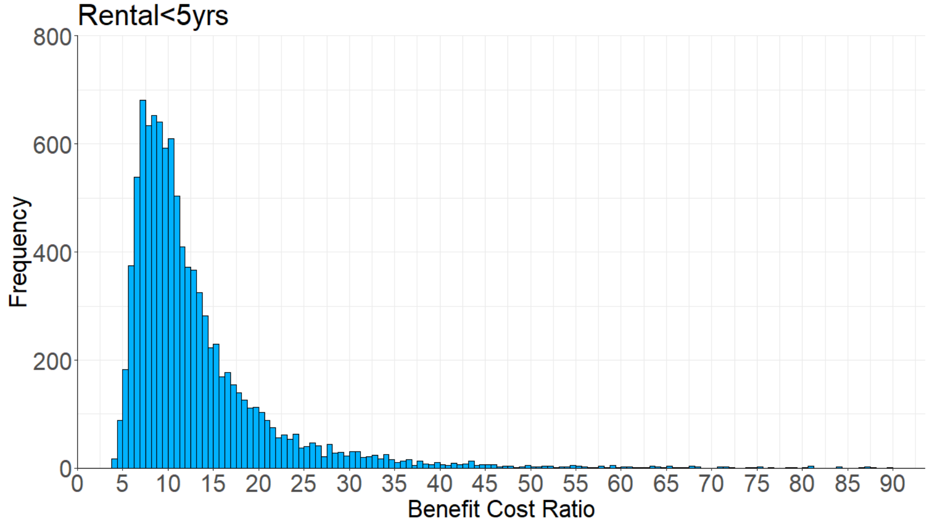
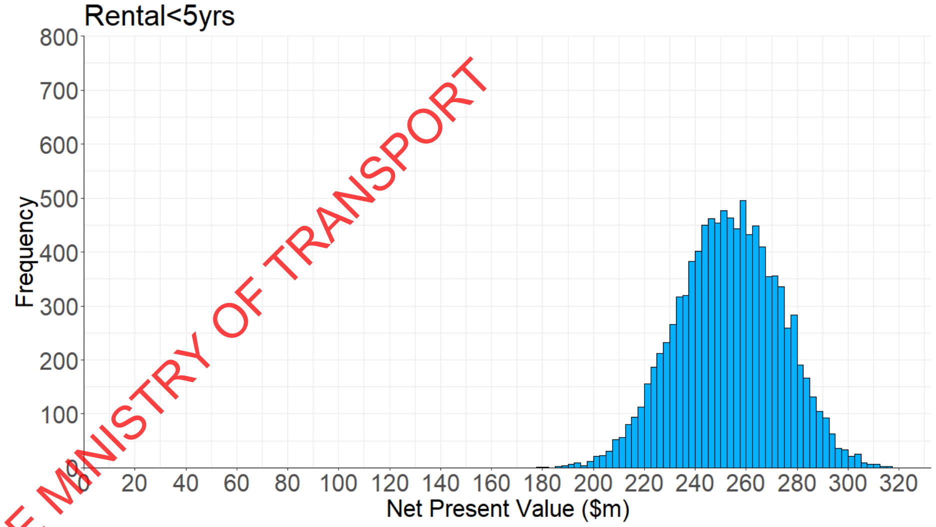
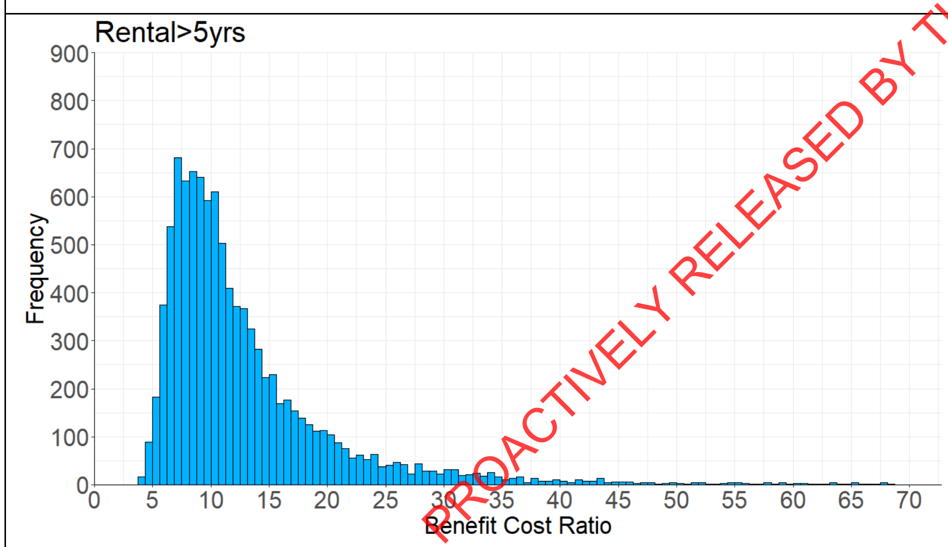
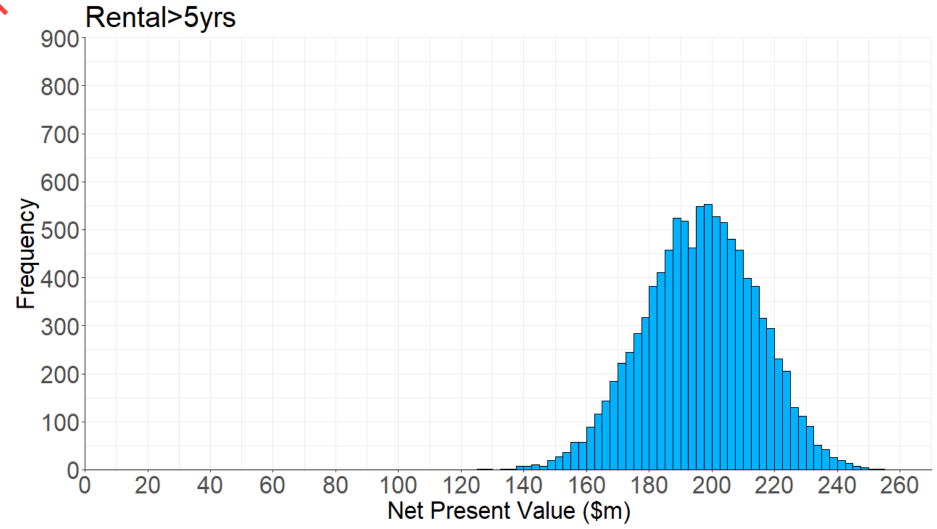
Benefit Cost Ratio	Net Present Value



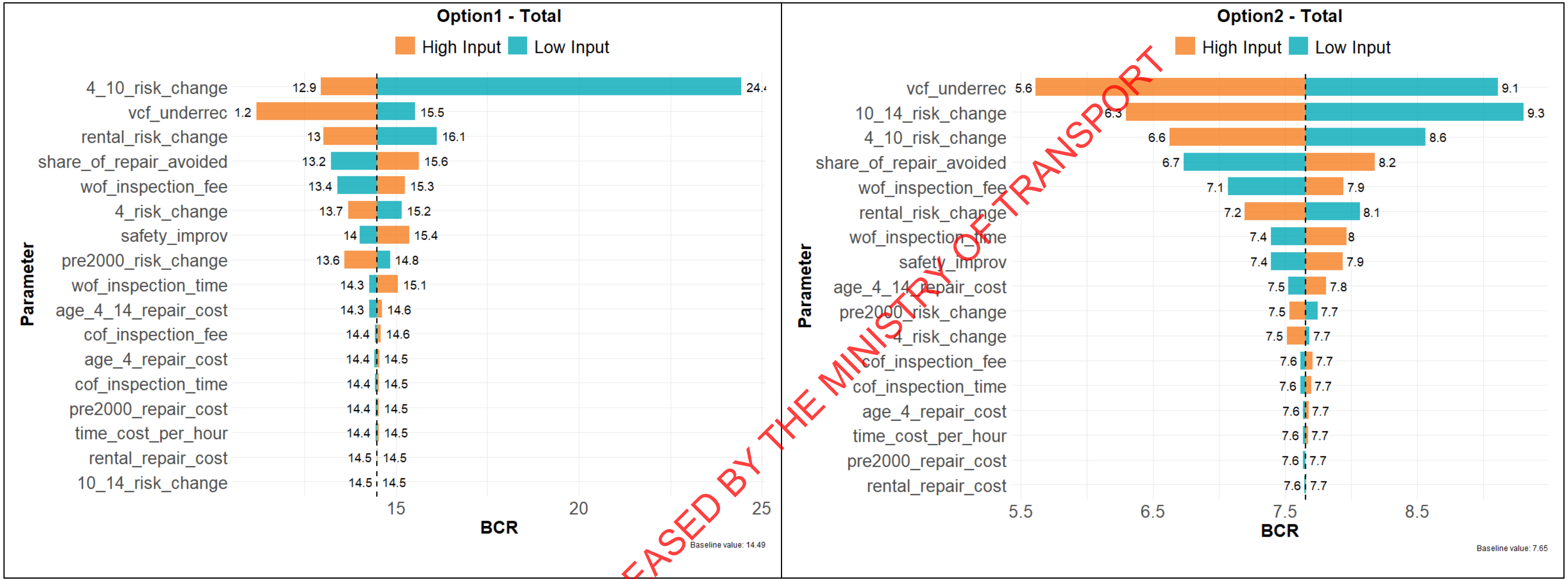






Benefit Cost Ratio	**Net Present Value**
	
	

Annex 7. Tornado plots showing the effect the variable inputs have on the key results



Note: The *10_14_risk_change* parameter has no effect on the results for Option 1. The model includes all variable inputs in the graph by default.

Annex 8. Foregone WOF/COF label revenue per year in nominal terms ($m)

Years	≤4yrs	4_10yrs	10_14yrs	Pre2000	Rental<5yrs	Rental≥5yrs	Option 1 total	Option 2 total
2027	0.7	2.2	1.7	1.5	0.2	0.1	**4.6**	**6.5**
2028	0.7	2.2	1.8	1.4	0.2	0.1	**4.5**	**6.4**
2029	0.7	2.2	1.8	1.3	0.2	0.1	**4.4**	**6.3**
2030	0.7	2.2	1.9	1.2	0.2	0.1	**4.3**	**6.3**
2031	0.7	2.2	1.8	1.1	0.2	0.1	**4.2**	**6.1**
2032	0.7	2.2	1.8	0.9	0.2	0.1	**4.0**	**6.0**
2033	0.7	2.2	1.8	0.8	0.2	0.1	**3.9**	**5.9**
2034	0.8	2.2	1.9	0.7	0.2	0.1	**3.8**	**5.8**
2035	0.7	2.2	1.8	0.6	0.2	0.1	**3.7**	**5.7**
2036	0.8	2.2	1.8	0.5	0.2	0.2	**3.6**	**5.5**
2037	0.8	2.2	1.8	0.3	0.2	0.2	**3.5**	**5.4**
2038	0.8	2.2	1.8	0.2	0.2	0.2	**3.4**	**5.4**
2039	0.8	2.2	1.8	0.1	0.2	0.2	**3.3**	**5.3**
2040	0.8	2.3	1.8		0.2	0.2	**3.2**	**5.2**
2041	0.8	2.3	1.8		0.2	0.2	**3.2**	**5.2**
2042	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.3**
2043	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.3**
2044	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.3**
2045	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.3**
2046	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.3**
2047	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.3**
2048	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.4**
2049	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.4**
2050	0.8	2.3	1.8		0.2	0.2	**3.3**	**5.4**
2051	0.8	2.3	1.8		0.3	0.2	**3.3**	**5.4**
2052	0.8	2.3	1.8		0.3	0.2	**3.3**	**5.4**
2053	0.8	2.3	1.8		0.3	0.2	**3.3**	**5.4**
2054	0.8	2.3	1.8		0.3	0.2	**3.3**	**5.4**
2055	0.8	2.3	1.8		0.3	0.2	**3.3**	**5.4**
Total	***21.9***	***65.4***	***52.4***	***10.6***	***6.2***	***5.0***	***104.2***	***161.7***

Annex 9. Preliminary analysis of WOF/COF changes for motorcycles

This is a preliminary analysis on applying the proposed policy to motorcycles. It uses the same methodology and vehicle groupings as the main report

Our analysis finds the policy would result in a large increase in the number of road injury crashes (see Table 17) for those vehicle groups, delivering a net cost to society as shown by the NPVs and BCRs in Table 18. In addition, **the estimated net costs exceed the estimated net benefit for the light vehicle groups.**

Both rental motorcycle vehicle groups have only had 1 inspection-identifiable crash from 2015 to 2024, suggesting minimal safety risk from reducing their inspection frequency. However, the compliance benefits from these vehicle groups are small.

The key driver of this result is the much higher relative risk ratios estimated for the motorcycle vehicle groups (Table 16) compared to those for light vehicles (Table 5). However, there is a greater amount of uncertainty in these estimates due to the lower sample sizes.

The higher relative risks are translated into a sizeable increase in the number of injury crashes (relative to their fleet size).

The evidence presented does not justify the inclusion of motorcycles in the proposed reduction to WOF/COF inspection frequencies.

Table 16. Changes in relative risk for motorcycles since last inspection (for each week increment)

Motorcycle vehicle group	Intercept	Relative risk coefficient (ie slope of the risk line)			Degrees of freedom
		Low limit estimate (-2SD)	Central estimate	Upper limit estimate (+2SD)	
Up to 4 years	0.0047	+0.0009	+0.0026***	+0.0043	19
4 – 10 years	0.0321**	-0.0000	+0.0009*	+0.0040	24
10 – 14 years	0.0626	-0.0005	+0.0018	+0.0040	14
Pre-2000 (<40 years)	0.0640	-0.0080	+0.0032	+0.0144	8
Rental under 5 years	Unable to model these vehicle groups due to limited historic crash data.				
Rental over 5 years					

Note: Asterisks denote statistical significance at 1% (***), 5% (**) and 10% (*) based on the coefficient's p-value.

SD – Standard deviation.

Table 17. Increase in motorcycle crash numbers by vehicle group and severity - cumulative total for the years 2027 to 2055

Effects		≤4yrs	4_10yrs	10_14yrs	Pre2000	Rental<5yrs	Rental≥5yrs	Option 1	Option 2
Motorcycles	**Fatal**	1 to 2	3 to 21	3 to 20	0 to 1	0	0	***4 to 23***	***11 to 39***
	Serious	5 to 14	22 to 174	32 to 218	0 to 6	0	0	***34 to 186***	***101 to 358***
	Minor	8 to 23	29 to 235	36 to 242	1 to 9	0	0	***49 to 254***	***129 to 447***
Light vehicles	**Fatal**	0 to 1	1 to 7	5 to 13	0 to 1	0 to 2	0 to 2	***3 to 10***	***11 to 24***
	Serious	3 to 8	7 to 46	44 to 109	0 to 4	1 to 8	2 to 12	***17 to 60***	***74 to 166***
	Minor	15 to 47	41 to 276	264 to 568	2 to 17	5 to 35	3 to 19	***92 to 345***	***429 to 964***

Table 18. Monetised effects by motorcycle group - cumulative total for the years 2027 to 2055 (all dollar values are discounted at an 2% rate)

Effects		≤4yrs	4_10yrs	10_14yrs	Pre2000	Rental<5yrs	Rental≥5yrs	Option 1	Option 2
Present value of Benefits ($m)	Inspection cost	6 to 12	15 to 27	9 to 17	5 to 8	1 to 1	1 to 1	**26 to 48**	**36 to 66**
	Compliance time	2 to 4	5 to 8	3 to 5	2 to 3	0 to 0	0 to 0	**9 to 15**	**12 to 20**
	Avoidable repairs	1 to 5	5 to 19	3 to 11	2 to 8	0 to 0	0 to 0	**8 to 31**	**11 to 42**
	Total benefits	**11 to 18**	**30 to 49**	**18 to 30**	**10 to 17**	**1 to 1**	**1 to 2**	**52 to 86**	**72 to 118**
Present value of **Costs ($m)**	Fatal crashes	9 to 26	33 to 269	38 to 257	1 to 10	0	0	**55 to 290**	**142 to 494**
	Serious crashes	6 to 19	29 to 232	43 to 292	1 to 10	0	0	**45 to 250**	**136 to 481**
	Minor crashes	2 to 6	8 to 61	9 to 63	0 to 3	0	0	**13 to 67**	**34 to 117**
	Total costs	**17 to 51**	**70 to 563**	**91 to 613**	**1 to 23**	**0**	**0**	**114 to 607**	**317 to 1095**
NPV ($m)		***-37 to -2***	***-523 to -31***	***-590 to -67***	***-10 to 13***	***1 to 1***	***1 to 2***	***-536 to -47***	***-993 to -207***
Net effect per vehicle ($/year)		***-151 to -9***	***-452 to -27***	***-844 to -96***	***-55 to 73***	***139 to 183***	***137 to 181***	***-337 to -29***	***-432 to -90***
BCR		***0.3 to 0.9***	***0.1 to 0.5***	***0.0 to 0.3***	***0.6 to 10.3***	***N/A***	***N/A***	***0.1 to 0.6***	***0.1 to 0.3***

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