

**ACC Motor Vehicle Account
2010/11 Technical Report on
Levy Setting Methodology
For Consultation**

Actuarial Services

ACC

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Executive Summary

1.1 Introduction

This report sets out the details of ACC's calculations of 2010/11 levy rates for public consultation for the Motor Vehicle Account. The levy rates for consultation are based on an actuarial analysis using data and information through 30 June 2009. Note that after consultation, levy indications will be reviewed taking into consideration data and information through 30 September 2009. Once final levy rate decisions have been made, an appendix will be added to this report to include the final 2010/11 levy rates that come into force on 1 April 2010 and the final technical report will be issued.

This latest update is based on ACC models to predict accidents occurring beyond 30 June 2009. For the portion of the levy associated with funding accidents that have occurred on or prior to 30 June 2009, estimates of unpaid costs are from ACC's valuation report "*Accident Compensation Corporation Valuation of Outstanding Claims Liabilities as at 30 June 2009 (Based on data as at 30 June 2009)*" dated 31 August 2009.

1.2 Nature of the Motor Vehicle Account

The Motor Vehicle Account covers all personal injuries arising from accidents involving motor vehicles on public roads. More specifically, a motor vehicle injury may be:

- personal injury suffered because of the movement of a motor vehicle
- personal injury suffered because of a stationary motor vehicle being struck by another motor vehicle or some other means of conveyance.

The Motor Vehicle Account does not, however, cover injuries resulting from:

- injuries suffered during the off-road use of a motor vehicle
- loading, unloading, repairing, or servicing a motor vehicle, or using a motor vehicle other than as a means of conveyance.

There are other possible exceptions if the vehicle is being used as a means of transport to or from a place of work, and the vehicle is provided by that workplace.

Motor vehicle injuries tend to be more severe than injuries covered in the other accounts. Approximately 128 serious injuries are anticipated to occur during the 2010/11 levy year unfortunately as a result of motor vehicle accidents. This is compared to only 20 serious injuries projected for the Work Account. The largest component of support payments to serious injured individuals is social rehabilitation in the form of home care and capital expenditure on aids, appliances, and modifications to their home and vehicle. Another significant component of support is weekly compensation. Most severely injured individuals are anticipated to receive support from the scheme for the remainder of their life. Therefore long payment durations, for some claims up to 80 years, are characteristic of the Motor Vehicle Account.

Prior to 1 July 1999, ACC operated on a pay-as-you-go (PAYG) funding basis. PAYG funding means that levies are collected at the start of the year to cover just the claim payments expected in the upcoming year.

As a result of the PAYG funding basis, by 1 July 1999, a substantial liability for future claim payments in respect of accidents that had occurred prior to 1 July 1999 had built up, without a matching asset balance. In other words, the New Zealand accident scheme, ACC, had a substantial unfunded liability in respect of pre-July 1999 claims that continued to require support.

Current legislation requires the pre-July 1999 injuries to be fully-funded by 30 June 2014 and the consultation levy rates for 2010/11 have been calculated on that basis.

Injuries that occur on or after 1 July 1999 are meant to be funded on a fully funded basis. However, over the course of the past several years levy rates have not been charged to coincide with indicated injuries, therefore a portion of the post-1999 fund is inadequate. The levy rates in consultation attempt to ensure accidents projected to occur in levy year 2010/11 are fully funded and that the unfunded portion of the post-1999 Motor Vehicle Account reaches full funding over a period of up to 10 years.

Levies used to fund these injuries are collected on petrol and through licensing fees.

1.3 Indicated Levy Rates

Table 1.3 shows the Motor Vehicle Account 2010/11 indicated levy rates including the smoothing adjustment that forms part of the consultation rate. The smoothing adjustment allows for a limited increase in the composite levy, whereby the funding of the Post-1999 readjustment is delayed to later years.

Table 1.3

<u>2009/10 Levy Rate</u>	
287.00 = [A]	
2010/11 Indicated Levy Rate by Rate Component	
Indicated Levy for Accident Year 2010/11	204.60 = [B]
Post-1999 Readjustment Levy	103.32 = [C] (5 Year Readjustment Funding Horizon)
Post-1999 Levy	307.92 = [D] = [B] + [C]
Residual Levy <u>212.68</u> = [E] (2013/14 Residual Funding Horizon)	
Indicated Rate before Smoothing	520.60 = [F] = [D] + [E]
Indicated Rate change before Smoothing	81.4% = [G] = ([F] / [A]) - 1
Smoothing Adjustment <u>(103.32)</u> = [H]	
Composite Levy	<u>417.28</u> = [I] = [F] + [H]
Indicated Rate change after Smoothing	<u>45.4%</u> = [J] = ([I] / [A]) - 1

In the following section the funding policy for the Motor Vehicle Account is outlined that formulate the basis for the consultation levies. The remainder of this report sets out details of the methodology used to calculate the Aggregate levy rates shown in Table 1.3, as well as details related to Motor Vehicle rates by vehicle class.

Funding

1.4 Current Funding Policy

ACC is required to ensure that all levied Accounts have enough funds to provide for future costs (i.e. are fully funded) and that the levies charged to cover these costs are fair and stable.

Managing these two requirements is the focus of ACC's funding policy, which aims to:

- manage levy stability over time
- Ensure each ACC Account has enough funds.

The two key elements that make up the funding policy are:

- **funding target** - this is based on the total value of the ongoing future costs of new and existing claims. The target must ensure that enough funds are accumulated to be quite sure that these funds adequately cover future costs
- **timeframe** - the time over which funds will be restored to the funding target if the target is not being achieved.

The funding target is affected by the economic assumptions used in estimates of future claim costs (e.g. the rate of return on investments and inflation rates on medical costs) and the margins included for forecasting uncertainty.

1.5 Pre-1999 residual claims

ACC still needs to collect levies to pay for the ongoing costs of claims for injuries that occurred before 1 July 1999, when not enough levy was collected to fund the full lifetime costs of these claims (at that time ACC only collected enough levies to pay for each year of costs as they occurred).

These levies are set with the goal of building up sufficient reserves so that from 1 July 2014 ACC will be able to pay for the costs of these claims from the reserves and from the interest these reserves will earn (i.e. fully funded). The requirement to fund the lifetime costs of these claims by 30 June 2014 is contained within the Injury Prevention, Rehabilitation, and Compensation Act 2001 (the IPRC Act). After 2014 there will no longer be a separate levy for pre-1999 claims.

1.6 Reporting standards and assumptions

The New Zealand Financial Reporting Standards require the future claim costs liability (which is shown in the ACC Financial Statements) to be assessed using a risk-free interest rate and an additional risk margin to be included to allow for the inherent uncertainty in projecting these long-term claim liabilities.

ACC has selected a risk margin for each levy Account that provides around a 75% probability that the future claims estimate will be adequate. This is in line with the Australian Prudential Regulation Authority's requirement of private insurers in Australia.

1.7 Legislative funding requirements

Section 169 of the IPRC Act requires that the Motor Vehicle Account levy rates be calculated so that the costs of all claims are fully funded. Section 193 requires that the cost of residual claims in the Motor Vehicle Account be fully funded by the year 2014.

1.8 Funding policy adopted for 2010/11

ACC has adopted the following funding policy in assessing the 2010/11 levy proposals. In addition to applying this funding policy, ACC may consider and apply other factors in determining the final total levy proposal.

Current levies (i.e. funding for post 1 July 1999 claims)

- (a) The funding target is to maintain assets equal to the outstanding claims provision at the end of each financial year.
- (b) The outstanding claims provision is to include a risk margin that provides a 75% probability that the outstanding claims provision is adequate to cover future claim payments.
- (c) The outstanding claims provision is to be based on a long-term, risk-free interest rate of 6%, based on long-term historical trends. The interest rate for the first three years is based on the most recent yield curve indicated from the trading market of the New Zealand government bond.
- (d) The total levy requirement is to be assessed each year as:
 - a. the expected fully funded cost of claims and expenses for injuries that are expected to be incurred during the upcoming levy yearplus or minus
 - b. a 'funding adjustment' aimed at achieving the funding target over a maximum period of the next 10 levy years. The timeframe selected will have particular regard to intergenerational equity and affordabilityplus or minus
 - c. a 'smoothing adjustment' to provide additional levy stability or smoothing of changes over time.
- (e) Where assets are expected to be lower than the funding target at the beginning of the levy year, funding and smoothing adjustments will not be applied if they would result in the total levy being lower than that required to fully fund the

cost of claims and expenses for injuries that are expected to be incurred during the upcoming levy year.

- (f) Levy structures and rates for classes of levy payers must be consistent with achieving the total levy requirement.

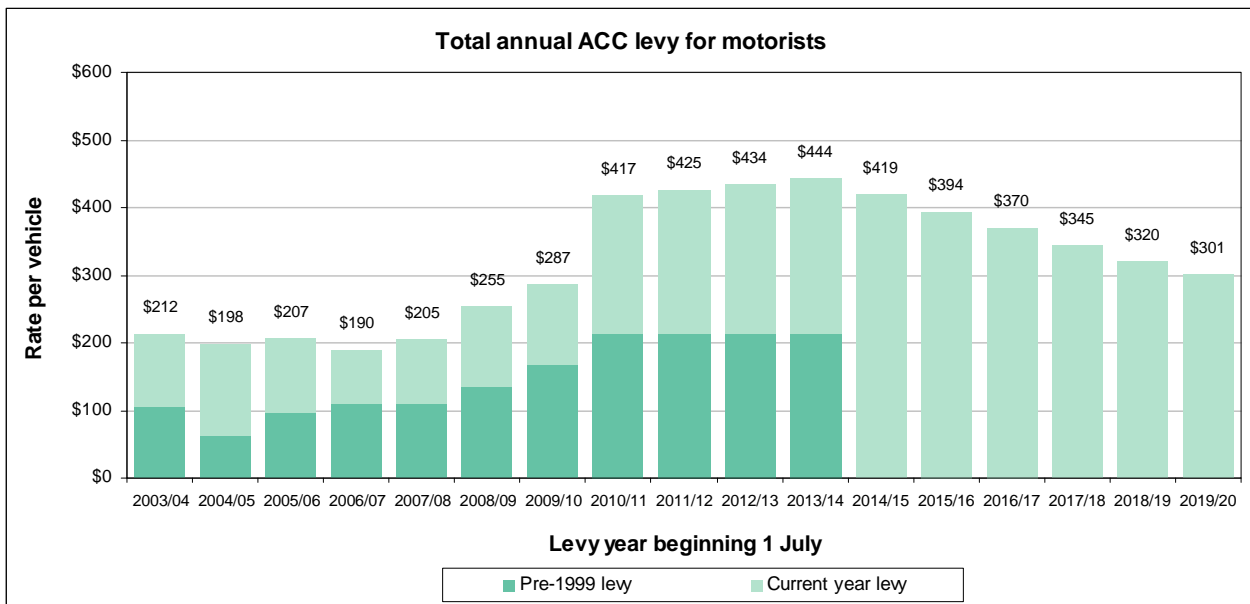
Residual levies (i.e. funding for pre 1 July 1999 claims)

- (a) The funding target is to have assets equal to 105% of the outstanding claim liability provision, no later than 30 June 2014.
- (b) The outstanding claims provision is to include a risk margin that provides a 75% probability that the outstanding claims provision is adequate to cover future claim payments.
- (c) The outstanding claims provision is to be based on a long-term, risk-free interest rate of 6%. The interest rate for the first three years is based on the most recent yield curve indicated from the trading market of the New Zealand government bond.
- (d) Residual levies are assessed to pay for the ongoing costs of residual claims and to establish the funding target by no later than 30 June 2014.
- (e) Levy structures and rates for classes of levy payers must be consistent with achieving the total levy requirement.

1.9 Path to full funding

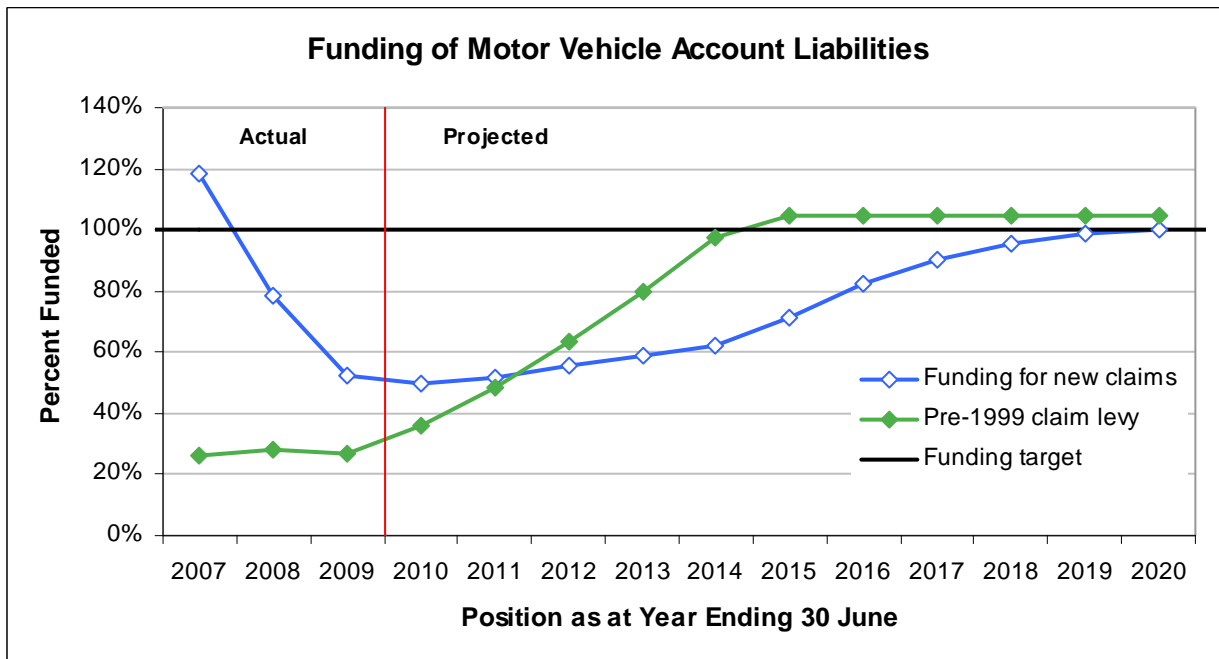
Where the Account is not at the funding target, a funding adjustment is included in the levy assessment that would restore funds to the target over a maximum of the next 10 years (or by 2014 for residual levies). Graph 2.6.1 below shows the projected levy rates associated with the Motor Vehicle Account.

Graph 2.6.1



Graph 2.6.2 illustrates the current funding position and the projected period over which the full funding target can be achieved based on the proposed rates for the Motor Vehicle Account.

Graph 2.6.2



The funding target for the Motor Vehicle Account is to hold assets equal to the outstanding claims liability provision at the end of the levy year (i.e. 100% funding position).

The Motor Vehicle Account currently holds assets equivalent to 52% of the claim liability for claims that occurred after 30 June 1999. The funding position is projected to reduce to 50% of claim liabilities as at 1 April 2010 (i.e. the beginning of the new 2010/11 levy year) as the current 2009/10 levy rate is not sufficient to cover claim costs.

ACC proposes to increase the 2010/11 levy for the Motor Vehicle Account to cover costs and restore reserves over a time period of up to 10 years.

The Motor Vehicle Account currently holds assets equivalent to 27% of the claim liability for claims that occurred after 30 June 1999. ACC has assessed the proposed Residual levy for this Account so that the levy collected plus the interest earned will ensure that the funding target is reached by 30 June 2014, as required by legislation.

Changes in Methodology and Assumptions

1.10 Changes in Estimating New Accident Years

In previous updates ACC has relied on projections of claims costs for future accident years supplied by ACC's external actuaries. This had been provided as add-on to the valuation process but was not a rigorous pricing exercise.

For this update, ACC has created its own model for each payment type to project future accident year frequencies and severities based on prior accident year indications implied by the valuation indications. Historical payment patterns are reviewed and projected payment patterns selected. As part of the exercise we have reviewed the statistical implications of projections provided by ACC's external actuaries. The model is the first step in developing intimacy and ownership of the underlying levy rate proposals. Enhancements in modelling are planned in the future to intensify our understanding of the injury rate and use of the Scheme by those injured in motor vehicle accidents.

The methodology used in the model and list of planned future improvements are discussed in more detail in sections 0 and 0.

1.11 Changes in Discount Rates and Investment Return Forecasts

The risk-free interest rate is the interest rate that it is assumed can be obtained by investing in financial instruments with no default risk.

Although a truly risk-free asset exists only in theory, in practice most organisations use Government bond rates as the base. These securities are considered to be risk-free because the likelihood of governments defaulting is extremely low. Since this interest rate can be obtained with no risk, it is implied that any additional risk taken by an investor should be rewarded with an interest rate higher than the risk-free rate.

In determining the risk-free interest rate for levy assessments, ACC is looking to strike a balance between four factors:

- (a) being confident that at least that level of interest will be earned and levy payers will not be required to provide additional funding
- (b) selecting both a short-term and long-term interest rate that best corresponds with the mix and duration of claims anticipated to occur during any given year
- (c) achieving a reduction in the volatility of future levy changes by not being overly responsive to normal economic cycles
- (d) increasing transparency and removing undue complexity around a key assumption.

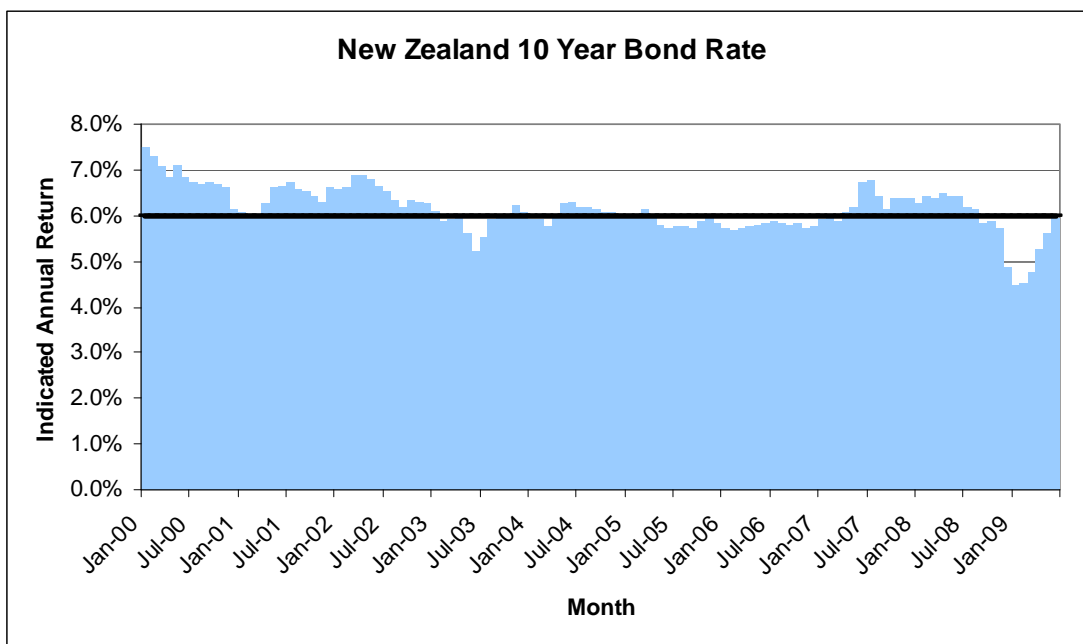
ACC has reviewed its methodology for establishing the risk-free interest rates used for discounting the future costs of claims.

Balancing the risks associated with short-term responsiveness and long-term stability that best correspond with the mix of claims anticipated to occur during any given year, ACC has reviewed risk-free instruments that best match the patterns of its claim payments.

Although the payment of claims for more serious injuries can last many decades, a local trading market of risk-free instruments beyond a 10-year maturity is limited. Therefore, ACC has chosen interest rates for:

- The first three years, based on the most recent yield curve indicated from the trading market of New Zealand Government bonds. The yield curve is then compared with ACC’s short-term investment strategy and mix of assets taking into account the current economic environment.
- Beginning year four, a long-term, risk-free interest rate based on a review of the 10-year overall average return of New Zealand Government bonds. As shown in Graph 3.2 below, the current long-term interest rate indication is 6.0%. We anticipate this assumption should remain stable through time, reducing overreaction in levies due to natural economic cycles. However, the assumptions will be reviewed as part of the annual levy-setting process.

Graph 3.2



1.12 Adjustment to Capture Full Impact of Expected Future Rate Increases

In prior reviews anticipated future rate increases of cabinet approved social rehabilitation rates and regulated rates associated with medical services were capped at the labour cost index.

In an actuarial peer review performed by the Department of Labour’s actuaries, it was noted that not fully taking into account the impact of future rate increases results in an

estimate that is below a central actuarial estimate. The risk of not fully accounting for future costs will result in future increases in funding associated with prior year claims. The impact of this becomes cumulative through time as the numerous rate changes that will occur over the coming decades will have a multiplicative affect on many claims, especially the serious injury claims. This will result in restatement of the funding position of the Motor Vehicle Accounts multiple times in the future on a pool of claims, notably the serious injuries that will continue to grow through time.

In recognition of this risk the Board has decided to fully reflect the expected costs of all future rate increases in the organisation's financials. It is preferred that a central estimate indeed reflects all expected costs. Future increases in the funding required for prior year claims in the fully funded Motor Vehicle Account is not desirable nor is it common industry practice to explicitly expose one's organisation to this risk.

As at the latest valuation review, as at 30 June 2009, work was performed to analyse the historical rate increases in social rehabilitation and medical costs. Based on this analysis the following superimposed inflation assumptions were used in the valuation:

- Social Rehabilitation - Over the last five years, the hourly care rates payable to contracted agency have increased from 58% to 70% of New Zealand average hourly rates. The valuation assumption adopted was to allow for the care rates to increase by additional 1.5% per annum above normal wage inflation for the next 10 years. Over the longer term (from 2020) the assumption is to allow for rate increases of 1% per annum above normal wage inflation.
- Short term medical - currently about one half of total Short Term Medical payments relate to regulated services. Historical trends and an external study of changes in global general practitioner rates indicated a superimposed inflation assumption of 1.0% per annum.
- Other Medical Services - currently about a third of the total "other" medical payments relate to regulated services. Historical trends and external information indicated a superimposed inflation assumption of 0.5% per annum.
- Elective Surgery - currently about three percent of the total elective surgery payments relate to regulated services. The superimposed inflation trend is similar to those mentioned above.

The projections for future accident periods are based on the valuation indications, therefore, the projections implicitly account for the change in methodology of fully reflecting the cost of all future expected rate changes.

1.13 Future changes on the Horizon

The levy rate proposals developed by ACC are based on the best information and trends known at this stage, however both ACC and the Minister for ACC appreciate that the increasing levels of Scheme costs are resulting in unacceptably high levy rates for all New Zealanders.

A number of key initiatives are being considered to manage the ongoing growth in claims and Scheme costs. These initiatives are outlined in the consultation document, along with their estimated impacts on the proposed levy rates. Please refer to the consultation document for more information.

Motor Vehicle Account Aggregate Levy Rate

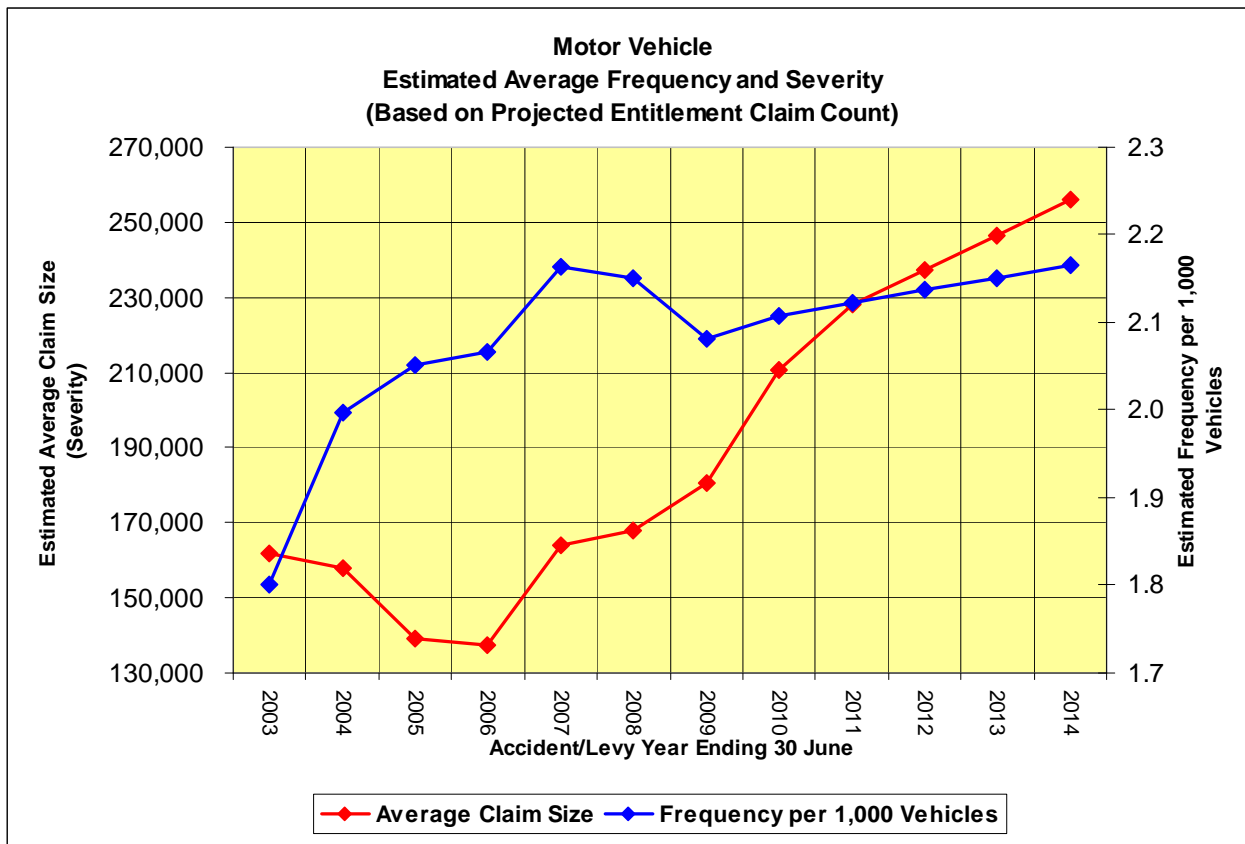
1.14 Fully-Funded Claims Costs

The projection of fully-funded costs for the Motor Vehicle Account for accidents incurred in the 2010/11 and future levy years is detailed in Section 0. Refer to Section 0 for definition of terms and details of the methodology of projecting claim costs for the 2010/11 accident year by payment type, projecting claim frequency and severity.

The next step in the process involved projecting at a total Account level and comparing this to the sum of the individual payment type projections. The final claim cost projections was selected based on the indications from the two approaches.

As part of the methodology projections of the future number of claims (frequency) and average undiscounted claim size (severity) were made. Frequency is the number of motor vehicle entitlement claims receiving ACC support per 1,000 vehicles. Entitlement claims are a subset of claims, those receiving support beyond just medical service. Severity is the ratio of the estimated ultimate claims payments to the number of entitlement claims. The results of the frequency and severity projections are shown in Figure 4.1.

Figure 4.1 Frequency and Severity Projections for the Motor Vehicle Account



The selected ultimate claim costs are then distributed among the payment types in the same ratio as the projected sum. Historical payment patterns are reviewed and projected payment patterns selected. The cash flows are then discounted in order to determine the Central Estimate Pure Risk Premium component of the Aggregate Levy

Rate. Table 4.1 shows both projected undiscounted and discounted claim costs, pure risk premium, to cover motor vehicle accidents that are anticipated to occur between 1 July 2010 and 30 June 2011.

Table 4.1 Projected Discounted Pure Risk Premium (Claim Costs) for 2010/11 Levy Year

Motor Vehicle Account Projected Discounted Pure Risk Premium for Accident Year 2010/11						
	Central Estimate				Anticipated Funding from	
	[A]	[B]	[C]	[D]=[B]/[A]	[E]=[D]	[F]=1-[E]
	Payments (\$000) Undiscounted	Payments (\$000) Discounted	Estimated Average Payment Lag	Discount Factor	Levy	Investment Income
Medical						
Short Term	24,830	12,273	27.2	0.49	49%	51%
Other	77,046	20,742	37.5	0.27	27%	73%
SI - Social Rehabilitation						
Capital	75,579	19,127	33.2	0.25	25%	75%
Care	707,364	167,677	34.6	0.24	24%	76%
Weekly Compensation						
Fatal	35,974	24,687	8.8	0.69	69%	31%
Non-Fatal	377,414	142,460	24.1	0.38	38%	62%
Other Rehabilitation						
Vocational	21,087	10,958	16.4	0.52	52%	48%
Hospital (Elective Surgery)	147,449	31,757	40.4	0.22	22%	78%
Social - Capital	8,485	4,042	21.4	0.48	48%	52%
Social - Other	39,556	18,161	25.2	0.46	46%	54%
Lump Sum	13,663	10,534	5.4	0.77	77%	23%
All Other	13,553	4,224		0.31	31%	69%
PHAS	67,904	64,744		0.95	95%	5%
TOTAL	1,609,904	531,386	30.9	0.33	33%	67%

1.15 Exposure

The exposure base used for the 2010/11 levy rate for the Motor Vehicle Account is the projected number of licensed vehicles, the vehicles from which ACC will receive a levy. More particularly, exposure is based on the "equivalent number of vehicle years" where, for a given year, any vehicle that is licensed for a fraction of the year contributes only that fraction to the exposure.

It is important to distinguish between the number of licensed vehicles throughout a certain period of time, and the number of transactions made during this time. In general, there is a delay between a transaction being made and the period of exposure to which the transaction relates, as licences are usually paid in advance. It is common for a licence fee paid in a given year to relate to a licence period in the following year. Therefore, the number of licensed vehicles during the 2010/11 levy year is likely to differ from the number of licence fees paid.

In general, the number of licensed vehicles (on-road exposure) drives the exposure to risk and the amount of petrol levy collected, while the number of transactions made (paid exposure) determines the amount of licence fee collected.

The on-road exposure is projected similarly to the previous year. Development triangles are used to project the equivalent number of vehicles in initial months, for which a large proportion of transactions have already been paid. These triangles compare each licence period to when the transactions for this period are made (e.g., 12 months in advance, 11

months in advance, and so on). Assuming transaction behaviour remains roughly constant through time, the method uses historical numbers of transactions made each month in advance (or arrears) to project the number of outstanding transactions made for licence months for which some, but not all, fees have been collected.

In later months, development triangle methods become less reliable, due to increased uncertainty in initial development months and potential changes in transaction behaviour (for example, licence payers shortening the lengths of their licence periods as a result of economic downturn). Therefore, beyond this point, a rate of growth is chosen in order to be consistent with past growth rates in the vehicle fleet, and to be consistent with other projected exposure bases, such as the overall population.

Next, the earned/unearned levy ratio is calculated: that is, the proportion of levies collected in a given year that are accrued in that year. Then the relationship between the on-road exposure, paid exposure, and earned/unearned levy ratio amounts over the years can be used to derive estimates of the paid exposure. It is important to have estimates of the paid exposure that are consistent with estimates of the on-road exposure, as the on-road estimates are an important factor when projecting claim costs. These costs are in turn spread across the exposure base as an initial step towards determining levy rates.

Table 4.2 below shows the projected number of vehicles, both on the road and paying licence fees:

Table 4.2

(000)	Total Paid Exposure	On the Road Exposure
2005/06	2,964	2,942
2006/07	3,057	3,013
2007/08	3,114	3,090
2008/09	3,080	3,112
2009/10	3,183	3,150
2010/11	3,203	3,188
2011/12	3,241	3,227
2012/13	3,281	3,266
2013/14	3,320	3,305
2014/15	3,360	3,345
2015/16	3,401	3,385
2016/17	3,442	3,426
2017/18	3,483	3,468
2018/19	3,525	3,509
2019/20	3,568	3,552

1.16 Expenses

Allowances for all expenses associated with operating the ACC scheme Accounts have been included in the levy rates. These expenses include levy collection, injury prevention, claims management and general office and equipment overheads.

The figures shown in Table 4.3 have been taken directly from ACC's latest operational budgets with adjustments to convert to a March levy year, except for the claims handling expenses for the 2010/11 accident year. Based on an expense allocation model

developed by ACC's Finance division the claim handling expenses are allocated to Accounts. From this information claim handling expenses are allocated to accident year assuming specific expense ratios and cash flow are developed that are estimated to coincide with claim payment patterns.

The figures in Table 4.3 the breakdown of discounted claims handling, injury prevention, levy collection and levy setting expenses for the 2010/11 levy year for the Motor Vehicle Account, compared to the 2009/10 levy year. Also shown is the proportion of the new year levy allocated to these expenses (the expense ratio).

Table 4.3 Expenses for the Motor Vehicle Account (Amounts in (\$000))

Amounts (\$000)	2009/10		2010/11	
	Discounted Cost	Expense Ratio	Discounted Cost	Expense Ratio
Claims Handling	32,142	5.3%	34,573	5.3%
Operating Costs	379	0.1%	404	0.1%
Injury Prevention Costs	8,213	1.3%	8,899	1.4%
Levy Collection Costs	6,638	1.1%	6,921	1.1%
Total	47,372	7.7%	50,796	7.8%

1.16.1 Bad debt loadings and Timing of Levy Receipt

Unlike the other accounts, there is no bad debt assumed for the Motor Vehicle Account as levies are not invoiced and a measurement of non-compliance cannot be determined until after an accident actually occurs. Petrol levies are paid at the pump while all vehicles (other than exempt vehicles) are required by law to be licensed. License fees are collected by land Transport of New Zealand on behalf of ACC.

As licence fees are paid throughout the year, it is assumed that on average licence fees are paid in the middle of the levy year.

1.16.2 Public Health Acute Services (PHAS)

Included in the expenses are bulk-funded public health acute services paid annually to the Ministry of Health via Treasury. The Ministry of Health provides data on actual amounts paid to patients which are matched against ACC's claim database to allocate the costs between Accounts. The amount to be paid for the 2009/10 June year is provided by the Ministry of Health and future levy year amounts are projected based on this estimate and historical trends. The projected amount of PHAS allocated to the Motor Vehicle Account for levy year 2010/11 is estimated to be approximately \$68 million.

1.17 Risk Margin

The funding policy adopted by the ACC Board includes the addition of a risk margin on claim costs, including claims handling expenses, meant to provide a 75% level of sufficiency. The risk margins adopted for the 2010/11 levy rates are unchanged from those used for 2009/10, provided in an analysis by PwC in 2007. ACC has plans to review this analysis in time for the next levy setting process.

The risk margin is applied to the outstanding discounted claim cashflows as at the end of the levy year, as this is the time when the funding position is assessed. The Motor Vehicle Account risk margin of 13.7% of the outstanding claims liability at the end of the 2010/11 levy year translates to 10.6% of the new levy year claim costs, including claim handling expenses and public health acute services.

1.18 Levy Rates for New Year Claims

The levy rates applicable for funding the costs associated with the new year's claims is calculated using the following formula:

$$\frac{\text{Discounted Claim Costs} + \text{Discounted Expenses} + \text{Risk Margin}}{\text{Exposures}}$$

Table 4.5 shows the components of the new year levy rate based on current projections for the 2009/10 and 2010/11 levy years based on data and information through 30 June 2009.

Table 4.5 Components of Levy Rate for Accidents Incurred in the New Levy Year (Amounts in \$000)

Scheme Costs for New Levy Year (\$000)	2009/10		2010/11	
	Discounted Cost	Levy Rate	Discounted Cost	Levy Rate
Public Health Acute Services	62,497	19.63	67,904	21.20
All Other Claim Payments	435,905	136.95	463,482	144.70
Claims Handling	32,142	10.10	34,573	10.79
Risk Margin	56,112	17.63	59,756	18.66
Operating Costs	379	0.12	396	0.12
Injury Prevention Costs	8,213	2.58	8,712	2.72
Levy Collection Costs	6,638	2.09	6,776	2.12
Bad Debt & Timing of Payment	9,480	2.98	13,728	4.29
Total	611,366	192.07	655,326	204.60
Exposures (# of Vehicles)	3,183,041		3,203,017	

1.19 Post-1999 Levy Including Readjustment for Prior Years

The final component of the Motor Vehicle Account levy for post-1999 claims is the requirement to ensure any over- or under-funding of claims from prior years is accounted for and that the levy rate is set to ensure the Account is full-funded within the funding timeframe set by the ACC Board.

This component is calculated by projecting cashflows for claims, expenses, levy income and investment returns and examining the ratio of projected assets to outstanding claims liability at the end of each future levy year. A constant adjustment to the new year levy rate is calculated such that the Motor Vehicle Account is 100% funded, including risk margin, at the end a specific funding horizon up to 10 years.

The final step in setting the Post-1999 levy rate is the smoothing adjustment to maintain a degree of levy stability in the composite Motor Vehicle Account levy rate and to ensure the full cost of the new levy year claims are funded.

1.20 Residual Levy

As a result of ACC previously operating on a PAYG funding basis, ACC had a substantial unfunded liability in respect of pre-July 1999 claims that were still open on 1 July 1999. The residual portion of the Motor Vehicle Account covers the unfunded liability for non-work related claims made by Motor Vehicle between 1 July 1992 up until 30 June 1999.

Current legislation requires the residual portion of the Motor Vehicle to be fully-funded by 30 June 2014 and the consultation levy rates for 2010/11 have been calculated on that basis. ACC's funding policy requires the residual portion of the Motor Vehicle Account to be at 105% of the central estimate, including risk margin of 11.1%, after levy has been collected for the 2013/14 earnings year.

For known residual claims reported up until 30 June 2009 the valuation of ACC's outstanding claims liability conducted by PwC provides projected cashflows for the future costs, including claims handling expenses. These projected cashflows are discounted at the discount rates used for pricing. Expenses for levy setting and levy collection are added to the cash flows. An annual constant residual levy rate is determined such that the fund reaches the funding target by 2013/14 taking into account additional funding from investment income earned on accumulated assets associated with the pre-1999 claims.

Classification of risk

1.21 Class rates

For the 2010/11 levy consultation process, the ACC Board has decided to consult on an aggregate Motor Vehicle levy rate of \$417.28. This rate is made up of an average pre-1999 claims levy of \$212.68 and post-1999 claims levy of \$204.60.

The aggregate Motor Vehicle levies are funded through two sources - the vehicle licensing levies and the petrol levies.

ACC charges differential licence levies based on vehicle type. The relativity for petrol powered vehicles is the ratio of the levy rate for the vehicle class to the levy rate for Class 2 vehicles (petrol powered motor cars). The relativity for non-petrol powered vehicles is the ratio of the levy rate for the vehicle class to the levy rate for Class 6 vehicles (non-petrol powered cars).

1.22 Class structure

The nine classes of motor vehicle used by ACC in the previous year are shown below:

Class	Description
1	Exempt Vehicles EB Class Vehicles Trailers Holders of trade licenses for trailers & caravans Fire service vehicle & ambulances Hearses
2	Petrol Driven Motor Cars Self-propelled caravans Mobile cranes Passenger service vehicles All petrol driven motor vehicles not elsewhere classified Holders of trade licenses for vehicles not elsewhere classified
3	Petrol Driven Tractors Mopeds Veteran and vintage motor vehicles Non-registered vehicles
4	Petrol Driven Motorcycles
5	Petrol Driven Van/Truck/Utility
6	Non petrol driven Motor cars Self-propelled caravans Mobile cranes Passenger service vehicles All non-petrol driven motor vehicles not elsewhere classified
7	Non petrol driven Tractors Mopeds Veteran and vintage motor vehicles Non-registered vehicles
8	Non petrol driven Motorcycles
9	Non petrol driven Van/Truck/Utility

Analysis of the cost of injuries for motorcycles has revealed that there are differences in risk based on engine capacity. Also, the same analysis has shown that injury costs for moped vehicles are closer to those for small motor cycles, than for vintage/veteran vehicles and tractors, with which these are currently grouped. It has also been noted that ambulances, fire brigades, and hearses are currently in the class of exempt vehicles (Class 1) even though these vehicles pose an accident risk along with other vehicles. These observations have prompted a review of the existing ACC vehicle class structure.

For the 2010/11 levy year, it is proposed that the following changes are made to the class structure:

- o to introduce three subclasses within Classes 4 and 8 based on engine capacity. The proposed subclasses are:
 - 4a/8a: motorcycles up to and including 125cc
 - 4b/8b: motorcycles from 126cc up to and including 600cc

4c/8c: motorcycles 601cc and over

- o to move mopeds from Classes 3 and 7 (vintage, veteran, mopeds, and tractors) to the new Classes 4a and 8a (motorcycles with an engine capacity not exceeding 125cc)
- o to move hearses from Class 1 (exempt vehicles) to Classes 2 and 6 (passenger vehicles).

The proposed 2010/11 vehicle classes are in the table below:

Class	Description
1	Exempt Vehicles EB Class Vehicles Trailers Holders of trade licences for trailers & caravans Fire service vehicle & ambulances
2	Petrol Driven Motor Cars Self-propelled caravans Mobile cranes Hearses Passenger service vehicles All petrol driven motor vehicles not elsewhere classified Holders of trade licences for vehicles not elsewhere classified
3	Petrol Driven Tractors Veteran and vintage motor vehicles Non-registered vehicles
4a	Petrol Driven Mopeds Motorcycles up and including 125cc
4b	Petrol Driven Motorcycles from 126cc up to and including 600cc
4c	Petrol Driven Motorcycles 601cc and over
5	Petrol Driven Van/Truck/Utility
6	Non petrol driven Motor cars Self-propelled caravans Mobile cranes Hearses Passenger service vehicles All non-petrol driven motor vehicles not elsewhere classified
7	Non petrol driven Tractors Veteran and vintage motor vehicles Non-registered vehicles
8a	Non petrol driven Mopeds Motorcycles up and including 125cc
8b	Non petrol driven Motorcycles from 126cc up to and including 600cc
8c	Non petrol driven Motorcycles 601cc and over
9	Non petrol driven Van/Truck/Utility

1.23 Relativities

In conjunction to the change in class structure, ACC has reviewed its class relativities this year. This is intended to understand and reduce the level of cross-subsidisation between vehicle classes. The table below shows the set of relativities used by ACC in the 2009/10 levy year:

Class	Description	Fuel	Pre-1999 Claims Levy Relativity	Post-1999 Claims Levy Relativity
1	Exempt Vehicles	N/A	0%	0%
2	Motor Cars	Petrol	100%	100%
3	Mopeds, tractors	Petrol	35%	35%
4	Motorcycles	Petrol	150%	150%
5	Van/truck/utility	Petrol	100%	100%
6	Motor Cars	Non-petrol	100%	100%
7	Mopeds, tractors	Non-petrol	35%	35%
8	Motorcycles	Non-petrol	150%	126%
9	Van/truck/utility	Non-petrol	100%	121%

In the previous levy year, the relativities for the pre-1999 claims levy were different to those for the post-1999 levy, due to the petrol levy component of the post-1999, and the effect of travel distances on revenue collected by ACC. It is proposed that a separate set of relativities (a set of distance relativities) is introduced to represent the average distance travelled by each class compared to Classes 2 and 6. A petrol-powered class with a high distance relativity consumes more petrol and pays more petrol levy. Therefore, the licence fee for this class may be reduced, as ACC collects more petrol levy from these vehicles in general, and therefore requires less licence fee. With this change, it is no longer necessary to use different relativities for the post-1999 and pre-1999 portions of the levy.

The table below shows the proposed distance relativities to be adopted:

		Total distance travelled (x 10 ⁶ km) (A)	# licensed vehicles (B)	Average distance travelled (km) (C = A ÷ B x 10 ⁶)	Distance travelled relative to light passenger vehicles/buses
2007 data	Motor cycle	330	74,836	4,406	36%
	Light commercial vehicles/trucks	8,426	436,652	19,298	156%
	Light passenger vehicles/buses	31,432	2,537,627	12,386	100%
2008 data	Motor cycle	293	85,902	3,413	28%
	Light commercial vehicles/trucks	8,385	447,066	18,756	156%
	Light passenger vehicles/buses	30,938	2,575,165	12,014	100%
Adopted	Motor cycle				30%
	Light commercial vehicles/trucks				150%
	Light passenger vehicles/buses				100%

(A) obtained from Ministry of Transport New Zealand Vehicle Fleet Annual Statistics 2007

(B) equivalent number of licensed vehicles based on transaction data from Land Transport New Zealand

ACC does not collect information on the precise vehicle class associated with each Motor Vehicle Account claims. However, a recent collaborative effort with the Ministry of Transport (MoT) has allowed ACC to match its claims to records from the MoT Crash Analysis System (CAS). For the matched claims, this allows ACC to obtain the type of vehicle for each claim, including statistics such as the engine capacity and the year of manufacture.

The CAS information only allows the number of claims in each class to be identified, rather than the claim cost. To assess the total claim cost for each class, the CAS data needs to be combined with the statistical case estimate model. Inferences can then be made about the relative risk premiums in each class. Claim costs from the statistical estimate model are capped at \$750,000 and the excess is spread across the account and accident year in which it falls in proportion to the ultimate claim amounts. This is so that a given vehicle class is not unduly penalised by the incidence of exceptionally high-cost claims, and consequently fluctuation in relativities is reduced.

As with any data matching exercise, attention must be paid to data unable to be matched, and to data with missing field entries.

There exist the following numbers of records:

In CAS data, matched to an ACC claim	108,323
In CAS data, not matched to ACC claim	95,373

Of the matched claims, some have received no payments, while others are not claims made in the Motor Vehicle Account:

Matched to ACC claim, no ACC payments received	5,392
Matched to a non-Motor Vehicle claim	566

There are a number of claims that are either in the CAS data, but missing from the SCE model, or in the SCE model but missing from CAS. There exist the following numbers of claims:

ACC claims with no matching CAS record (since 2004)	157,946
ACC serious injury claims with no matching CAS records (since 2004)	134

While the number of ACC claims with no matching CAS record is very large, matched claims have an average cost of about \$13,000, compared to only \$3,000 for unmatched claims.

Most claims that are in the SCE model, but missing from CAS data, are for accidents that occurred before CAS data were collected. It is also inevitable that many claims resulting in claims to ACC were not officially attended, and do not appear in the CAS system. There are also claims that are in both sets of data, but have not been matched, due to a large number of errors in the data fields. It may be possible to amend the matching algorithms to match such claims, but this would lead to records being erroneously matched ("false positives").

A number of CAS records were not in the valuation accident dataset, but a quick sample of these verified that none of these have received payments from ACC; it is believed that these claims have received acute service treatment only, which is bulk-billed. A number of CAS records were recorded under other accounts, such as the Work Account. This may be valid if, for example, an accident occurs away from a public road, does not involve a

moving motor vehicle, or involves a work vehicle used for the purpose of travelling to or from work.

Attention has been concentrated on claims that have large ultimate cost in the SCE model, that are not matched to the CAS data. In almost all of these cases, it was possible to process these claims on a case-by-case basis, and assign an appropriate motor vehicle class. These claims were then added to the pool of matched claims with the assigned motor vehicle classes.

For motorcycles, 93% of recent matched CAS claims have a vehicle cc rating recorded. Data on motorcycles without a cc rating cannot be ignored, as these help to calculate the overall relativity of Class 4 to Class 2. However, data without a cc rating cannot be used to gain information on subclass relativities within class 4.

Similarly, there are many CAS records with no recorded year of manufacture. This means there is some uncertainty about which claims are in Classes 2 and 6, rather than 3 or 7. However, the number of matched records with year of manufacture before 1968 (a vehicle may be classified as a vintage car if and only if the vehicle is at least forty years of age) is very small. In fact, there are many more records with missing year of manufacture. Therefore, it has been assumed that all car records with missing year of manufacture belong to ACC Classes 2 and 6, rather than 3 or 7. The effect of this assumption is relatively inconsequential, as ACC is not looking to review the price relativity of ACC Class 3, which is currently set at 35%.

Many Motor Vehicle Account claims are made to ACC by persons not travelling in a licensed vehicle, such as claims by pedestrians, cyclists, and equestrians. Since such claims are not associated with a particular class, the costs associated with these claims are spread across the vehicle classes, weighted by exposure. This enables each vehicle to contribute evenly to this pool of claims.

Once an overall cost of claims has been calculated for each class, the costs are then compared to the vehicle numbers for each class, from which it is possible to obtain class relativities. Relativities have been estimated for each accident year since the 2003/04 year, and these relativities are then weighted by vehicle exposure to obtain an overall relativity. A 50% weighting has been selected for the 2008/09 accident year, to reflect the higher level of uncertainty contained in these estimates (allowance must be made for uncertainty arising from claims that have been incurred but not reported, and retrospective changes to the CAS data); a 50% weighting has also been selected for the 2003/04 accident year as this information from this accident year has less pertinence. All other years have been allocated a 100% weighting, to maximise the claims data across the years and thereby help to reduce the level of uncertainty.

The table below contains the weights, the true and the currently adopted relativities for the various classes:

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	WEIGHTED	True relativities to ACC Class 2						Currently adopted	
		2009	2008	2007	2006	2005	2004		
Class 2	100%	100%	100%	100%	100%	100%	100%		100%
Class 4a	412%	580%	414%	458%	305%	377%	442%	Mopeds 35%, Motorcycles 150%	150%
Class 4b	808%	896%	793%	1021%	705%	672%	750%		150%
Class 4c	1205%	1391%	1082%	1511%	1053%	1210%	975%		150%
Class 5	141%	116%	109%	140%	136%	173%	179%		100%

It is possible to contend that the above table shows evidence of changing relativities through time, noticeably for Classes 5/9. If this change is indeed a real underlying improvement in safety levels, and not simply due to random variation, levy rates will be revised downwards in future levy years as the decrease in relativity is sustained and obtains more credibility.

The exercise to calculate risk relativities revealed a large difference in risk rates between trucks and smaller commercial vehicles (vans and utility vehicles (utes)), with trucks showing a higher level of risk. This is driven by higher average claim costs. Under the current class structure, trucks, goods vans and utility vehicles (utes) are not distinguished from each other; these vehicles belong to either ACC Class 5 or 9, depending only on their motive power (petrol or non-petrol). If there is a difference in risk between trucks and vans/utes, these vehicles cannot be charged different rates under the current class structure, due to system constraints.

However, the proportion of Class 5 made up of trucks is different from the proportion of Class 9. It is possible to reflect some of the difference in risk by setting different relativities based on the makeup of each class. MoT publishes data on the number of petrol trucks, diesel trucks, petrol light commercial vehicles, and diesel light commercial vehicle in a given year, indicating that trucks made up more than 30% of Class 9, but less than 2% of Class 5. The totals represent the numbers of vehicles recording travel at some point during the year, which does not directly correspond to the number of licensed vehicles, but may be used as a proxy. We use the proportion of trucks using each fuel type to deduce the proportion of trucks in ACC Classes 5 and 9.

This allows the estimated claim costs from each year to be apportioned across Classes 5 and 9, and to calculate the relativity of Class 9 to Class 5. Having made an assumption about the overall relativity of Classes 5 and 9 to Class 2, the individual relativities of Classes 5 and 9 to Class 2 can be deduced. These relativities are shown in Table 9 below.

The relativities presented above are estimates of the true relativities between ACC vehicle classes, but are not necessarily the rates to be adopted by ACC when setting levies. In particular, ACC needs to ensure that its levies:

- Are appropriate when other factors are taken into consideration, and are reasonable
- Do not fluctuate unduly
- Reflect the appropriate level of cross-subsidisation between vehicle classes. There may be other external reasons to justify a certain level of cross-subsidisation

To charge levies to motorcyclists based on the relativities estimated above would result, for this group, in levy rates of magnitude far in excess of the current levy rates.

Therefore, it is intended that ACC maintain an overall relativity of Class 4/8 that is equal to the currently adopted relativity of 150% of Class 2, but use the true estimates of relativities to apply different relativities for the different subclass based on engine capacity.

Adopting an overall relativity of 150% for Class 4/8, the following relativities are proposed to be used for levy setting:

Table 9 - Proposed relativities

Class	Description	Fuel	Pre-1999 Claims Levy Relativity	Post-1999 Licence Levy Relativity
1	Service	N/A	0%	0%
2	Motor Cars	Petrol	100%	100%
3	Tractors, etc.	Petrol	35%	35%
4a	Mopeds, Motorcycles (0 - 125 cc)	Petrol	75%	75%
4b	Motorcycles (126cc - 600cc)	Petrol	140%	140%
4c	Motorcycles (601cc +)	Petrol	200%	200%
5	Trucks	Petrol	120%	120%
6	Motor Cars	Non-Petrol	100%	100%
7	Tractors, etc.	Non-Petrol	35%	35%
8a	Mopeds, Motorcycles (0 - 125 cc)	Non-Petrol	75%	75%
8b	Motorcycles (126cc- 600cc)	Non-Petrol	140%	140%
8c	Motorcycles (601cc +)	Non-Petrol	200%	200%
9	Trucks	Non-Petrol	150%	150%

1.24 Calculated Rates

Once the relativities for each class have been set, the Class 2 equivalent number of vehicles is calculated. This is a weighted aggregate number of vehicles, where each vehicle is weighted by its relativity. Under this measure of exposure, a single vehicle with a higher risk profile contributes more to the Class 2 equivalent exposure. The Class 2 equivalent number of vehicles is used to determine the levy rate for each class.

Two versions of the Class 2 equivalent number of vehicles are calculated: based on the estimated number paying a licence fee, and based on the estimated number of vehicles on the road. As noted in Section 1.15, these numbers are different in general. When calculating the licence fee amounts for each class, it is important to use the number of vehicles making a transaction, as these are the vehicles ACC receives a levy from. However, to calculate the petrol levy received for each class, it is more appropriate to use the number of vehicles on the road. This approach differs from the approach used in the previous levy year, whereby a single measure of exposure was used throughout.

The non-petrol powered vehicle levy rates for 2011/11, based on the aggregate rate of \$417.28 are shown below:

Class	Description	Fuel	Licence Levy
6	Motor Cars	Non-Petrol	\$390.56
7	Tractors, etc.	Non-Petrol	\$136.70
8a	Moped, Motorcycles (0 - 125cc)	Non-Petrol	\$292.93
8b	Motorcycles (126cc - 600cc)	Non-Petrol	\$546.78
8c	Motorcycles (601cc +)	Non-Petrol	\$781.12
9	Trucks	Non-Petrol	\$585.84

The petrol levy rates are calculated using the estimated petrol consumption for the year ending 30 June 2011 of 3,009 million litres. Two options for petrol levy were put forward: retaining the current rate of 9.90 cents per litre or increasing the petrol levy to 12.87 cents per litre.

The legislation does not allow petrol levy to fund pre-1999 claims. Based on this limitation, the maximum petrol levy is 12.87 cents per litre.

The licence levy rates for each class of petrol vehicles under both options are calculated as:

Class	Description	Petrol levy of 9.90 cents per litre	Petrol levy of 12.87 cents per litre
1	Service	Nil	Nil
2	Motor Cars	\$272.72	\$237.37
3	Tractors, etc	\$95.46	\$83.08
4a	Mopeds Motorcycles (0 - 125cc)	\$257.58	\$246.97
4b	Motorcycles (126 - 600cc)	\$511.43	\$500.82
4c	Motorcycles (601cc+)	\$745.77	\$735.16
5	Trucks	\$291.91	\$238.88

Fully Funded Projections for Future Levy Years

1.25 Changes in Estimating New Accident Years

In previous updates ACC has relied on projections of claims costs for future accident years supplied by ACC's external actuaries. This had been provided as add-on to the valuation process but was not a rigorous pricing exercise.

For this update, ACC has created its own model for each payment type to project future accident year frequencies and severities based on prior accident year indications implied by the valuation indications. Historical payment patterns are reviewed and projected payment patterns selected. As part of the exercise we have reviewed the statistical implications of the external actuaries' projections. The model is the first step in developing intimacy and ownership of the proposed levies associated with future accident years. Enhancements in modelling are planned in the future to intensify our understanding of the injury rate and use of the scheme by employers.

In prior reviews of ACC's outstanding claims liability, anticipated future rate increases of cabinet approved social rehabilitation rates and regulated rates associated with medical services were capped at the labour cost index. This limit on rate increases was carried through to the projections for future accident periods. The June 2009 valuation of ACC's outstanding claims liability includes a change in methodology to include the full effect of these anticipated rate increase.

The projections for future accident periods are based on the valuation indications for past accident years, therefore, the projections implicitly account for the change in methodology of fully reflecting the cost of all future expected rate changes.

1.26 Fully-Funded Claims Costs

This section covers the fully-funded costs for the Motor Vehicle Account for accidents incurred in the 2009/10 to 2013/14 financial years, with particular focus on the 2010/11 levy year. The section includes discussion related to each payment type.

1.26.1 Definitions

The purpose of this section is to provide definitions of several terms that will be used in the following sections. These include the following:

- **Accident Year:** Injuries occurring between 1 April and 31 March. The accident year is the year ending 31 March.
- **Frequency:** Frequency is the number of motor vehicle injuries receiving ACC support per 1,000 vehicles.
- **Severity:** The ratio of ultimate claims payments to the number of claims. The severity is the average claim size per claimant on an undiscounted basis.

- **Nominal:** refers to amounts on an undiscounted basis. This allows for a comparison of trends in severity between accident years
- **AWE:** refers to average weekly earnings. The “long” term inflationary trend in AWE is projected to be 3.5%.
- **CPI:** refers to the consumer price index. The “long” term inflationary trend in the CPI is projected to be 2.5%.
- **LCI:** refers to the labour cost index. The “long” term inflationary trend in the CPI is projected to be 2.7%.
- **Payment Type:** refers to type of compensation, medical, or rehabilitation support ACC provides. Support benefits have been categorized and analysed into the following key payment types:

Medical

Ambulance	Transportation to medical facility.
Short Term	payments to general practitioners, physiotherapists and radiologists
Other	Other medical (omed) includes all medical costs except Bulk-Billed costs, smed and Elective Surgery
Public Health Acute Services (PHAS)	covers costs relating to acute inpatient care; emergency department; outpatient; Miscellaneous PUs; Community trusts; Tertiary Adjusters; High Complex Burns; Extreme Complex Burns; Pharmaceuticals; and Laboratories for accidental injuries

Compensation

Non-Fatal	predominantly loss of earnings
Fatal	predominantly funeral grants and compensation support to spouse or/and dependent children

Rehabilitation

Elective Surgery	predominantly orthopedic related surgery
Lump Sum	additional support to compensate for permanent impairment due to an injury
Vocational	predominantly programs to support earners in their return to employment
Social	
Serious Injury	
Capital	predominantly housing and motor vehicle modifications for seriously injured clients
Non-Capital	predominantly care costs, such as attendant care, assessment costs and other related costs for serious injured clients
Non-Serious Injury	
Capital	predominantly equipment, orthotics for splints, medical consumables and residential modification costs for non-serious injuries
Non-Capital	provision of care, assessments and other support related social rehabilitation for non-serious injuries

1.26.2 Summary of 2010/11 Motor Vehicle Account indications

A summary of the estimated ultimate claim frequencies and severities by payment type for accidents occurring during the period 1 April 2010 and 31 March 2011 are summarized in the table below. Note the final overall indication was based on a weighted average of an analysis of all payments types and the sum of the indications from analyzing each

payment type separately. The total indication was then reallocated back to payment types based on the sum of the parts weightings.

Motor Vehicle Account Indicated Statistics Based on Projections of Pure Risk Premium						
Estimated Number of Vehicles (000) in Levy Year 2010/11 = 3,188 = [A]						
	Central Estimate		Indicated Statistics			
	[B] Payments (\$000) Undiscounted	[C] Number of Claims with Payment	[D]=[B]/[C]x1000 Severity	[E]=[C]/[A] Frequency per 1,000 Vehicles	[F]=[B]/Total [B] Distribution of Payments	[G] Est Average Payment Lag in Years
Medical						
Short Term	24,830	31,284	794	9.8	1.5%	27.2
Other	77,046	12,624	6,103	4.0	4.8%	37.5
SI - Social Rehabilitation						
Capital	75,579	116	651,710	0.036	4.7%	33.2
Care	707,364	128	5,518,820	0.040	43.9%	34.6
Weekly Compensation						
Fatal	35,974	429	83,823	0.13	2.2%	8.8
Non-Fatal	377,414	4,507	83,731	1.4	23.4%	24.1
Other Rehabilitation						
Vocational	21,087	2,730	7,724	0.9	1.3%	16.4
Hospital (Elective Surgery)	147,449	1,358	108,591	0.4	9.2%	40.4
Social - Capital	8,485	1,727	4,914	0.5	0.5%	21.4
Social - Other	39,556	3,427	11,541	1.1	2.5%	25.2
Independence Allowance	13,663	485	28,166	0.2	0.8%	5.4
All Other	13,553					
PHAS	67,904					
TOTAL Claim Payments	1,609,904	(Entitlement Only) 6,765	237,963	2.1	100.0%	30.9
CHE % Claim Payments	5% = [I]					
Claims Handling Expenses	84,810 = [J] = [I] Total [B]					
TOTAL	1,694,714 = [K] = Total [B] + [J]					
Discount Factor	0.334 = [L]					
TOTAL Discounted	565,959 = [M] = [K] x [L]					
Est % Funded from Inv Income	67% = [N] = ([K] - [M]) / [K]					

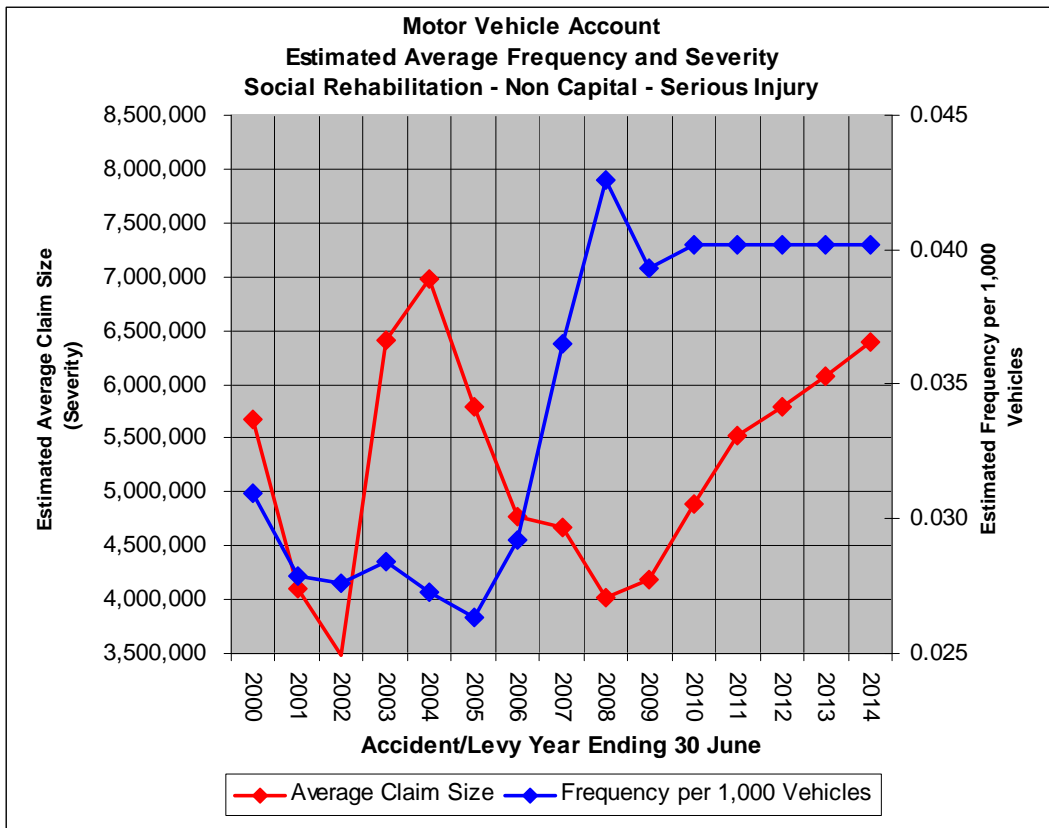
1.26.3 Social Rehabilitation - Serious Injuries

This includes care costs (such as attendant care), capital costs (such as housing and motor vehicle modifications), assessment costs and other related costs (for example travel costs) for clients seriously injured.

1.26.3.1 Serious non-capital social rehabilitation

Payments relating to social rehabilitation non-capital are the largest expenditure item in the Motor Vehicle Account (on a full-funded basis).

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Social Rehabilitation Non Capital - Serious Injury

Accident Year ending 30 June	Projected			Indicated Statistics		
	# Motor Vehicles	Number of Claims	Ultimate Nominal Payments (\$000)	Frequency	Severity	Cost per Motor Vehicles
2000	2,453	76	431,400	0.031	5,676,317	176
2001	2,476	69	282,863	0.028	4,099,459	114
2002	2,533	70	243,830	0.028	3,483,291	96
2003	2,637	75	481,345	0.028	6,417,937	183
2004	2,749	75	522,790	0.027	6,970,540	190
2005	2,846	75	434,295	0.026	5,790,596	153
2006	2,942	86	410,286	0.029	4,770,769	139
2007	3,013	110	513,285	0.037	4,666,230	170
2008	3,090	132	529,668	0.043	4,025,016	171
2009	3,112	122	512,523	0.039	4,190,817	165
2010	3,150	127	618,506	0.040	4,883,777	196
2011	3,188	128	707,218	0.040	5,517,683	222
2012	3,227	130	751,539	0.040	5,793,567	233
2013	3,266	131	798,638	0.040	6,083,245	245
2014	3,305	133	848,688	0.040	6,387,407	257

Period	Implied Annual Trends		
2000-2005	-2.4%	6.8%	4.3%
2005-2009	12.5%	-7.8%	3.7%
2010-2014	0.0%	6.5%	6.5%

The frequency increase from 2006 is due to:

- Change in definition - Improved profiling under ACC's National Serious Injury Service (NSIS), which was formally established in 2007, via the application of the objective measures of the Glasgow Coma Score (GCS) and Post Traumatic Amnesia (PTA) for traumatic brain injuries.

- During 2007 and 2008 there were a number of claims reviewed and reclassified from non-serious injury to serious injury.

These changes have been retrospective where possible but they have had a more significant impact on recent accident years because:

- The change in definition expanded the classification slightly. More recent claims are more likely to have had the tests required to classify them as serious injury.
- Some older claims that were incorrectly classified are no longer active (either through death or recovery).

We understand this process is largely completed, and significant future shifts from non-serious to serious are unlikely.

The increase in claims frequency is therefore due to reclassifications and with this largely complete then it is a one-off jump with future increases expected to be in line with population growth.

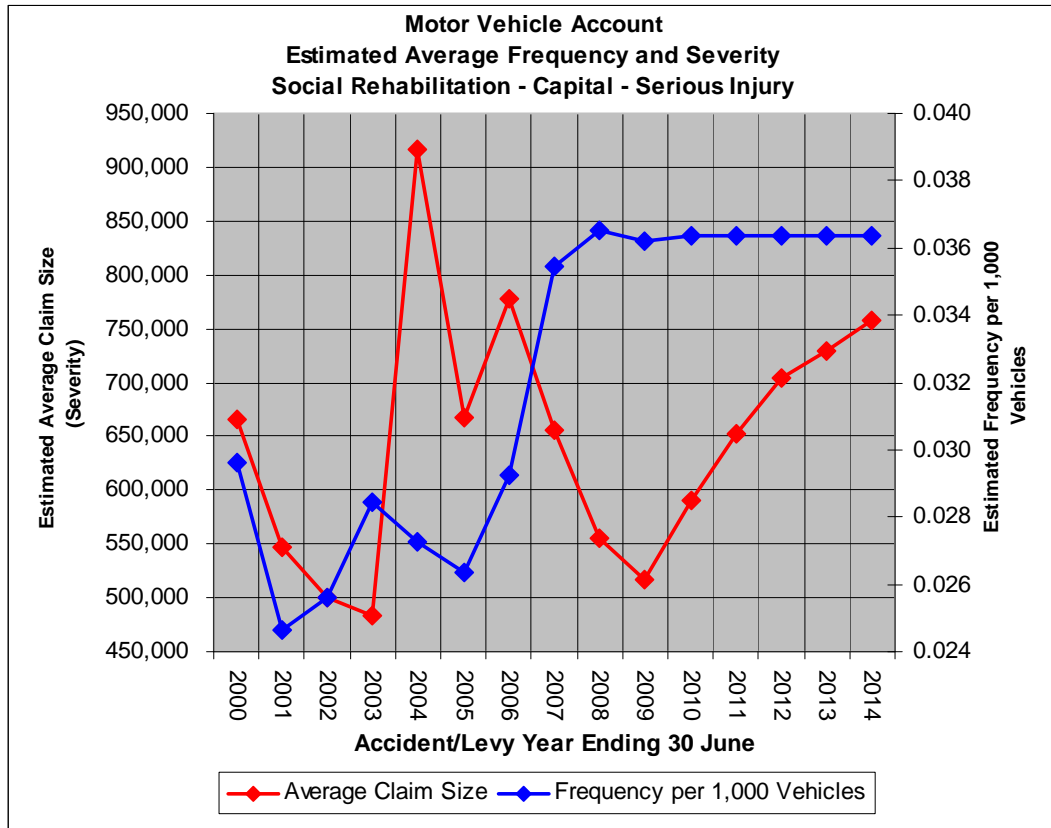
Severity decreased sharply in 2005 due to this reclassification. The reclassified claims are, on average, estimated to be less severe and hence carry a lower estimated severity. Now that the reclassification is complete, severities are expected to increase at approximately 2.3% above long term LCI caused by:

- Continuing pressure to increase rates for care services above LCI.
- Normal movement in the care packages as client needs and circumstances change over their lifetime.

The estimated average payment lag for serious injury social rehabilitation excluding capital is 35 years. Applying the discount rate assumptions to the 2010/11 serious injury social rehabilitation excluding capital estimated nominal cashflows (totalling \$707 million) results in a present value full funding estimate for 2010/11 of approximately \$168 million. This corresponds to a cost per licensed motor vehicle of about \$53.

1.26.3.2 Serious capital social rehabilitation

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Capital - Serious Injury

Accident Year ending 30 June	# Motor Vehicles [A]	Projected		Indicated Statistics		
		Number of Claims [B]	Ultimate Nominal Payments (\$000) [C]	Frequency [D]=[B]/[A]	Severity [E]=[C]/[B]x1,000	Cost per Motor Vehicles [F]=[C]/[A]
2000	2,453	73	48,351	0.030	665,012	20
2001	2,476	61	33,349	0.025	546,787	13
2002	2,533	65	32,416	0.026	500,161	13
2003	2,637	75	36,230	0.028	483,071	14
2004	2,749	75	68,687	0.027	915,826	25
2005	2,846	75	50,040	0.026	667,205	18
2006	2,942	86	66,855	0.029	777,388	23
2007	3,013	107	70,020	0.035	655,653	23
2008	3,090	113	62,601	0.037	554,648	20
2009	3,112	113	58,259	0.036	516,751	19
2010	3,150	115	67,700	0.036	590,813	21
2011	3,188	116	75,563	0.036	651,576	24
2012	3,227	117	82,619	0.036	703,923	26
2013	3,266	119	86,709	0.036	729,968	27
2014	3,305	120	91,003	0.036	756,977	28

Period	Implied Annual Trends		
2000-2005	-0.5%	4.5%	3.9%
2005-2009	9.0%	-8.1%	0.1%
2010-2014	0.0%	6.3%	6.3%

Again, the reclassification and definition expansion have resulted in a one-off increase in frequency from 2006. Frequency is expected to increase in line with pre-2005 experience.

Severity decreased sharply in 2005 due to this reclassification. The reclassified claims are, on average, are estimated to be less severe and hence carry a lower estimated severity. Now that the reclassification is largely complete, severities are expected to increase at approximately 1% above long term LCI.

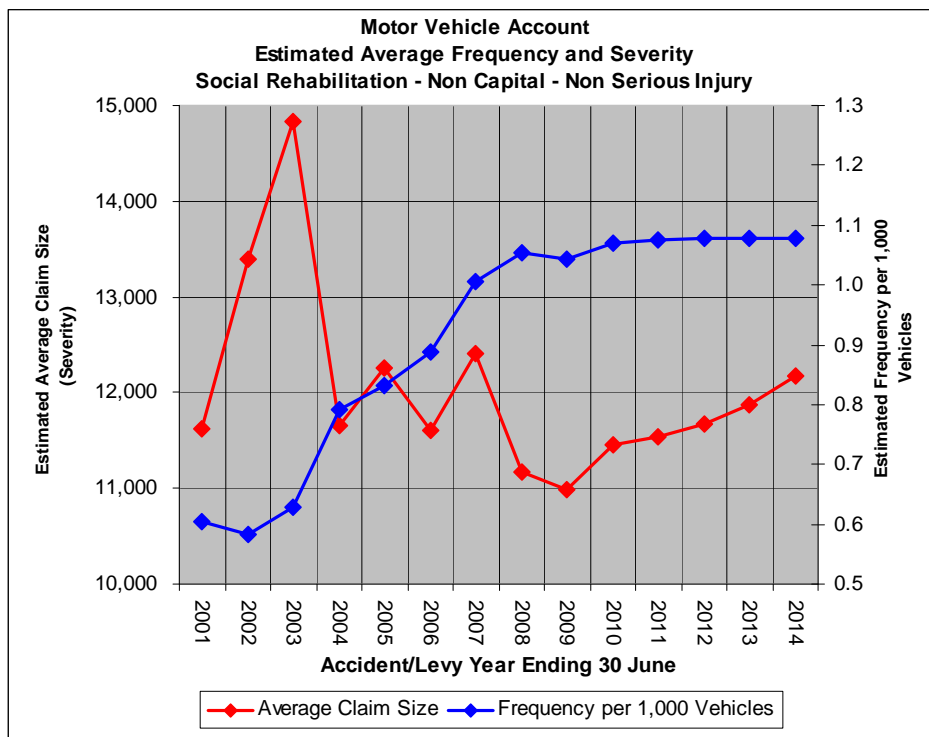
The estimated average payment lag for serious injury social rehabilitation capital is 33 years. Applying the discount rate assumptions to the 2010/11 serious injury social rehabilitation capital estimated nominal cashflows (totalling \$76 million) results in a present value full funding estimate for 2010/11 of approximately \$19 million. This corresponds to a cost per licensed motor vehicle of about \$7.

1.26.4 Social Rehabilitation - Non-Serious Injuries

Full allowance for future rate increases is now modelled.

1.26.4.1 Non-serious non-capital social rehabilitation

Payments grouped under this payment type consist of payments associated with provision of care, assessments and other support related social rehabilitation. Around 82% of total social rehabilitation expenditure for non-serious injuries is paid under this payment type.



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Social Rehabilitation Non Capital - Non Serious Injury

Accident Year ending 30 June	# Motor Vehicles	Projected		Indicated Statistics		
		Number of Claims	Ultimate Nominal Payments (\$000)	Frequency	Severity	Cost per Motor Vehicles
	[A]	[B]	[C]	[D]=[B]/[A]	[E]=[C]/[B]x1,000	[F]=[C]/[A]
2000	2,453	1,474	25,666	0.601	17,410	10.5
2001	2,476	1,494	17,369	0.603	11,629	7.0
2002	2,533	1,477	19,791	0.583	13,399	7.8
2003	2,637	1,660	24,636	0.630	14,838	9.3
2004	2,749	2,176	25,357	0.792	11,655	9.2
2005	2,846	2,368	29,023	0.832	12,256	10.2
2006	2,942	2,616	30,372	0.889	11,611	10.3
2007	3,013	3,029	37,606	1.006	12,414	12.5
2008	3,090	3,258	36,384	1.054	11,167	11.8
2009	3,112	3,245	35,667	1.043	10,991	11.5
2010	3,150	3,371	38,609	1.070	11,453	12.3
2011	3,188	3,427	39,547	1.075	11,539	12.4
2012	3,227	3,477	40,567	1.077	11,669	12.6
2013	3,266	3,523	41,797	1.079	11,866	12.8
2014	3,305	3,567	43,397	1.079	12,166	13.1

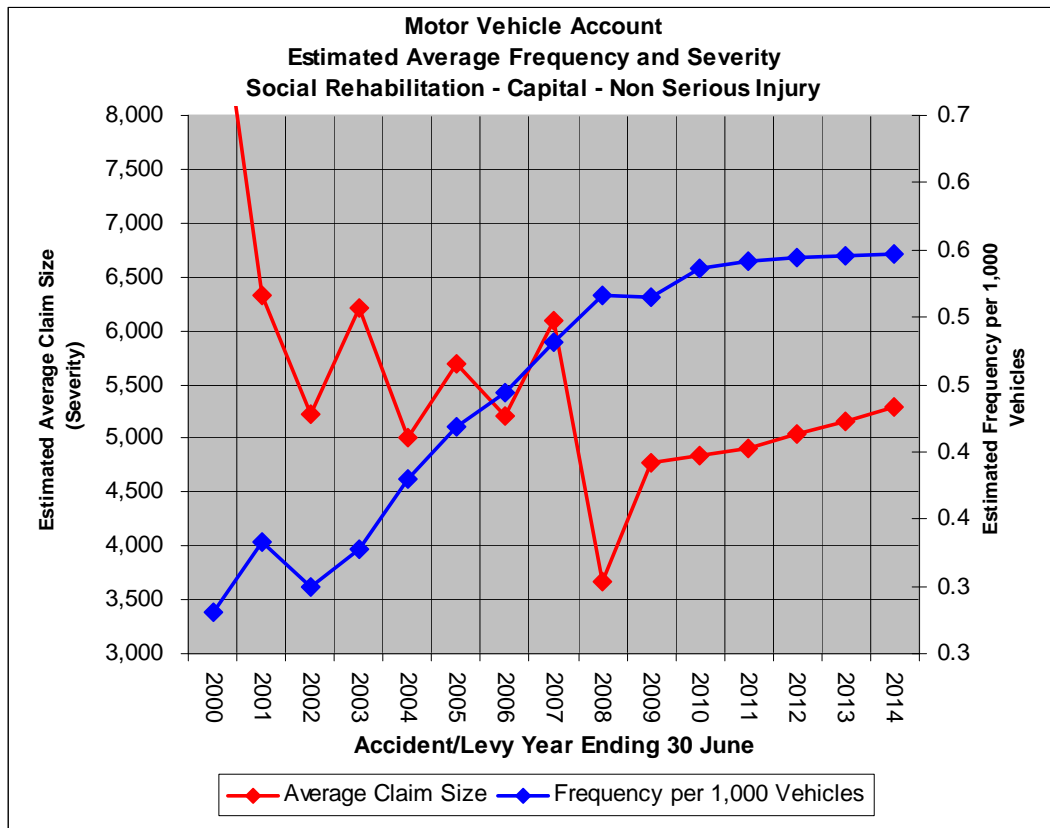
Period	Implied Annual Trends		
2000-2005	7.5%	-4.6%	2.5%
2005-2009	6.4%	-2.5%	3.7%
2010-2014	0.2%	1.5%	1.7%

Frequencies have risen from 2000, but have levelled off in the more recent accident years and we have projected this to continue until claim numbers stabilise. Severities have been variable from 2000 with no clear trend, and are projected to move towards the long-term LCI growth rate of 2.7%.

The estimated average payment lag for non-serious injury social rehabilitation excluding capital is 25 years. Applying the discount rate assumptions to the 2010/11 non-serious injury social rehabilitation excluding capital estimated nominal cashflows (totalling \$40 million) results in a present value full funding estimate for 2010/11 of approximately \$18 million. This corresponds to a cost per licensed motor vehicle of about \$6.

1.26.4.2 Non-serious capital social rehabilitation

Payments grouped under this payment type consist mainly of payments for equipment, orthotics for splints, medical consumables and residential modification costs.



Capital - Non Serious Injury

Accident Year ending 30 June	Projected			Indicated Statistics		
	# Motor Vehicles	Number of Claims	Ultimate Nominal Payments (\$000)	Frequency	Severity	Cost per Motor Vehicles
			[C]			
[A]	[B]	[C]	[D]=[B]/[A]	[E]=[C]/[B]x1,000	[F]=[C]/[A]	
2000	2,453	688	6,590	0.28	9,583	2.69
2001	2,476	825	5,217	0.33	6,325	2.11
2002	2,533	760	3,969	0.30	5,222	1.57
2003	2,637	864	5,358	0.33	6,204	2.03
2004	2,749	1,044	5,223	0.38	5,004	1.90
2005	2,846	1,190	6,775	0.42	5,695	2.38
2006	2,942	1,307	6,803	0.44	5,204	2.31
2007	3,013	1,452	8,836	0.48	6,087	2.93
2008	3,090	1,595	5,852	0.52	3,669	1.89
2009	3,112	1,602	7,647	0.51	4,774	2.46
2010	3,150	1,688	8,159	0.54	4,835	2.59
2011	3,188	1,727	8,483	0.54	4,913	2.66
2012	3,227	1,757	8,848	0.54	5,036	2.74
2013	3,266	1,783	9,204	0.55	5,162	2.82
2014	3,305	1,807	9,561	0.55	5,291	2.89

Period	Implied Annual Trends		
2000-2005	7.3%	-8.6%	-1.9%
2005-2009	5.8%	-6.8%	-1.4%
2010-2014	0.5%	2.3%	2.8%

Frequencies have risen from 2000, but growth has levelled off in the last 2 accident years and this is projected to continue until claim numbers stabilise. Severities have been variable from 2000 with no clear trend, and are projected to move towards the

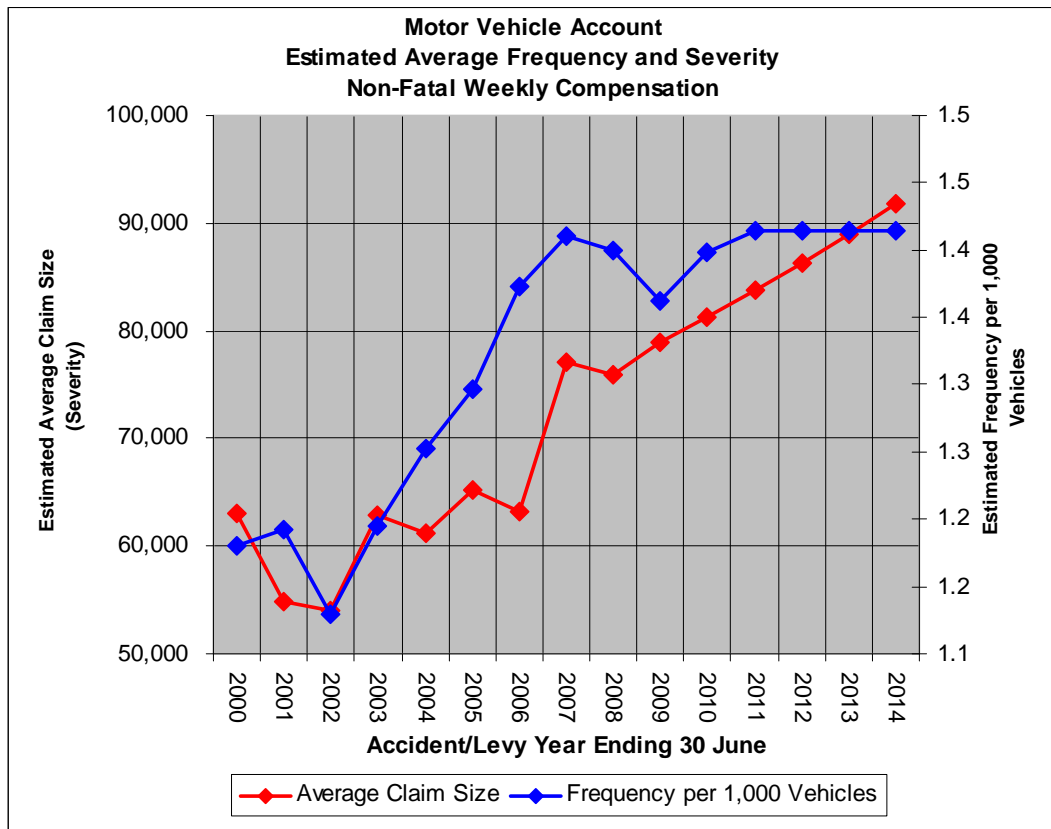
long-term CPI growth rate of 2.5%. This reflects the material nature of this payment type.

The estimated average payment lag for non-serious injury social rehabilitation capital is 21 years. Applying the discount rate assumptions to the 2010/11 non-serious injury social rehabilitation capital estimated nominal cashflows (totalling \$8 million) results in a present value full funding estimate for 2010/11 of approximately \$4 million. This corresponds to a cost per licensed motor vehicle of about \$1.20.

1.26.5 Weekly Compensation - Non-Fatal

Payments relating to non fatal weekly compensation are the second-largest expenditure item in the Motor Vehicle Account (on a full-funded basis).

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Weekly Compensation

Accident Year ending 30 June	Projected		Indicated Statistics			
	# Motor Vehicles	Number of Claims	Ultimate Nominal Payments (\$000)	Frequency	Severity	Cost per Motor Vehicles
			[C]	[D]=[B]/[A]	[E]=[C]/[B]x1,000	[F]=[C]/[A]
2000	2,453	2,895	182,493	1.18	63,045	74
2001	2,476	2,953	161,873	1.19	54,816	65
2002	2,533	2,861	154,657	1.13	54,065	61
2003	2,637	3,150	197,899	1.19	62,816	75
2004	2,749	3,441	210,848	1.25	61,273	77
2005	2,846	3,692	240,685	1.30	65,190	85
2006	2,942	4,040	255,692	1.37	63,294	87
2007	3,013	4,249	327,920	1.41	77,173	109
2008	3,090	4,325	328,154	1.40	75,874	106
2009	3,112	4,239	334,532	1.36	78,919	107
2010	3,150	4,404	357,580	1.40	81,202	114
2011	3,188	4,507	377,337	1.41	83,714	118
2012	3,227	4,562	393,704	1.41	86,304	122
2013	3,266	4,617	410,781	1.41	88,973	126
2014	3,305	4,673	428,599	1.41	91,726	130

Period	Implied Annual Trends		
2000-2005	1.9%	1.9%	3.9%
2005-2009	1.2%	5.8%	7.0%
2010-2014	0.2%	3.1%	3.3%

Claim numbers for weekly compensation have been increasing steadily since 2003, but have shown signs of falling in very recent years. As part of the service delivery model, a dedicated team has been created to focus on and reduce long-term weekly compensation claims pool. It is expected that the focus on reducing existing and new weekly compensation claims will result in a flattening of the frequencies.

Claim severities for non-fatal weekly compensation are driven by weekly compensation rates (indexed by LCI), and payment durations. Claim severities have been selected to grow at 3.1% per year. This is consistent with the long term AWE growth rate.

The estimated average payment lag for weekly compensation non-fatal is 24 years. Given that motor vehicle injuries tend to be more severe, it is not surprising that this average payment lag is much longer than that experienced by other accounts.

Applying the discount rate assumptions to the 2010/11 weekly compensation non-fatal estimated nominal cashflows (totalling \$377 million) results in a present value full funding estimate for 2010/11 of approximately \$142 million. This corresponds to a cost per licensed motor vehicle of about \$45.

1.26.6 Medical Treatment (excluding PHAS and Ambulance)

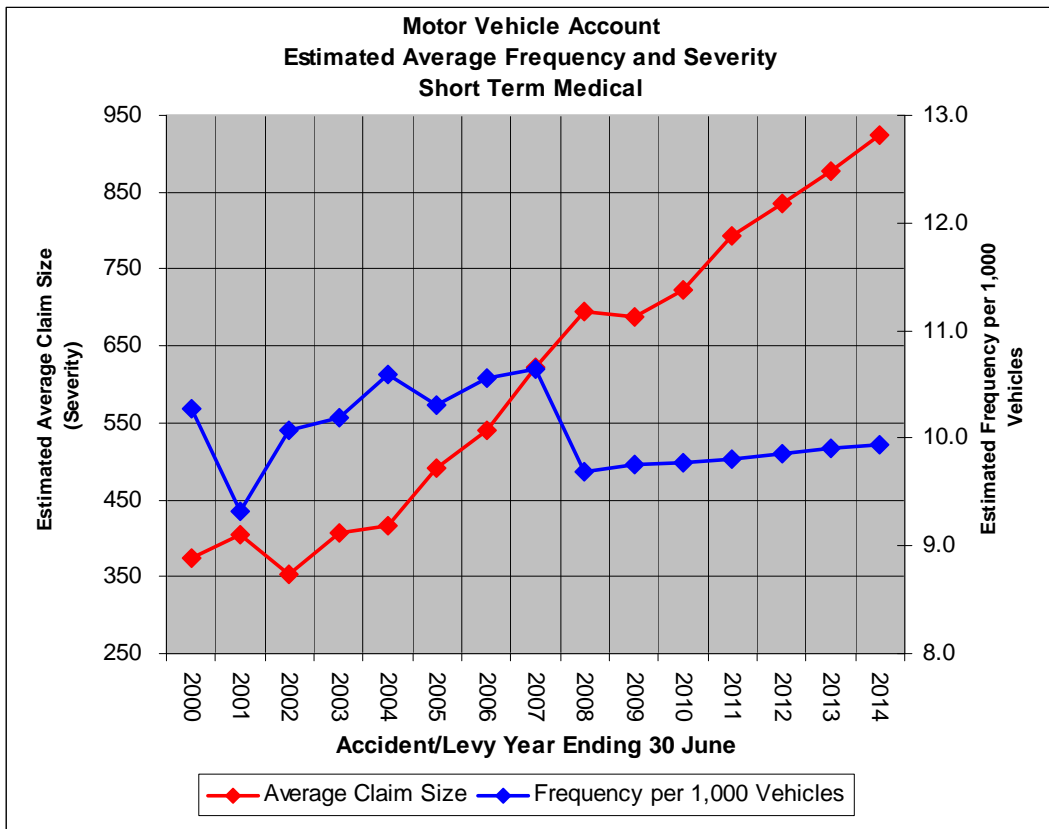
For modelling purposes, medical treatment is split between short-term medical (smed) and other medical (omed). Other medical now includes dental costs. Both short-term and other medical now include travel costs associated with medical treatment. Previously these were modelled with other rehabilitation.

1.26.6.1 Short-Term Medical

Short-term medical (smed) comprises payments to general practitioners, physiotherapists and radiologists. Most of the payments for smed occur shortly after the accident.

However, a small percentage of claims have on-going costs. Most of the claims are relatively minor (97%) and do not require any payments other than medical costs. Although the average costs are relatively small, there are a large number of claims each year (more than 30,000 projected for 2010/11).

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Short Term Medical

Accident Year ending 30 June	# Motor Vehicles	Projected		Indicated Statistics		
		Number of Claims	Ultimate Nominal Payments (\$000)	Frequency	Severity	Cost per Motor Vehicles
	[A]	[B]	[C]	[D]=[B]/[A]	[E]=[C]/[B]x1,000	[F]=[C]/[A]
2000	2,453	25,205	9,404	10.27	373	3.8
2001	2,476	23,096	9,356	9.33	405	3.8
2002	2,533	25,528	9,014	10.08	353	3.6
2003	2,637	26,860	10,900	10.18	406	4.1
2004	2,749	29,100	12,091	10.59	416	4.4
2005	2,846	29,349	14,434	10.31	492	5.1
2006	2,942	31,059	16,758	10.56	540	5.7
2007	3,013	32,040	19,924	10.64	622	6.6
2008	3,090	29,959	20,849	9.70	696	6.7
2009	3,112	30,353	20,869	9.75	688	6.7
2010	3,150	30,774	22,258	9.77	723	7.1
2011	3,188	31,284	24,825	9.81	794	7.8
2012	3,227	31,802	26,549	9.86	835	8.2
2013	3,266	32,329	28,392	9.90	878	8.7
2014	3,305	32,864	30,363	9.94	924	9.2

Period	Implied Annual Trends		
2000-2005	1.2%	4.7%	5.9%
2005-2009	-1.9%	9.7%	7.5%
2010-2014	0.4%	6.1%	6.6%

Accident year claim frequency was increasing towards 11 claims per 1,000 motor vehicles prior to 2008. From 2008 onwards, the claim frequency appears to have dropped back to about 10 claims per 1,000 motor vehicles. At this point in time we anticipate the frequency will continue to maintain itself around this level.

Indicated accident year nominal severities also appear to be relatively stable prior to 2005. We believe the aggressive increase from 2005 to 2008 in average claim size was due to a number of rate increases to treatment providers with the introduction of Endorsed Provider Network (EPN) Physiotherapy contract. Physiotherapists who met the requirements have signed up to this contract (currently the majority of providers have signed up and accounts for 85-90% of the total physiotherapy costs) and they were paid a higher contribution by ACC in exchange for not charging ACC clients a co-payment.

The EPN Physiotherapist Contract will be replaced on 16 November 2009. The replacement contract will reduce ACC's contribution and allow physiotherapists to charge a co-payment. The details of the replacement to the EPN Physiotherapist Contract were yet to be known at the time projecting future smed payments, so no allowance has been explicitly made in the projections.

Beyond the change for EPN, accident year severities are projected to stabilise for a couple of years and then increase in line with long term LCI +2.5% (5.2%) to reflect that health inflation typically runs higher than LCI.

The estimated average payment lag for short term medical is 27 years. Although almost all motor vehicle claims receive a short term medical payment straightaway, a number of these continue to receive payments throughout the duration of the claim. The main reason for this is that continuing weekly compensation requires ongoing certification by a general practitioner. Because the motor vehicle account tends to have more severe injuries, which can receive long periods of weekly compensation, there are many claims

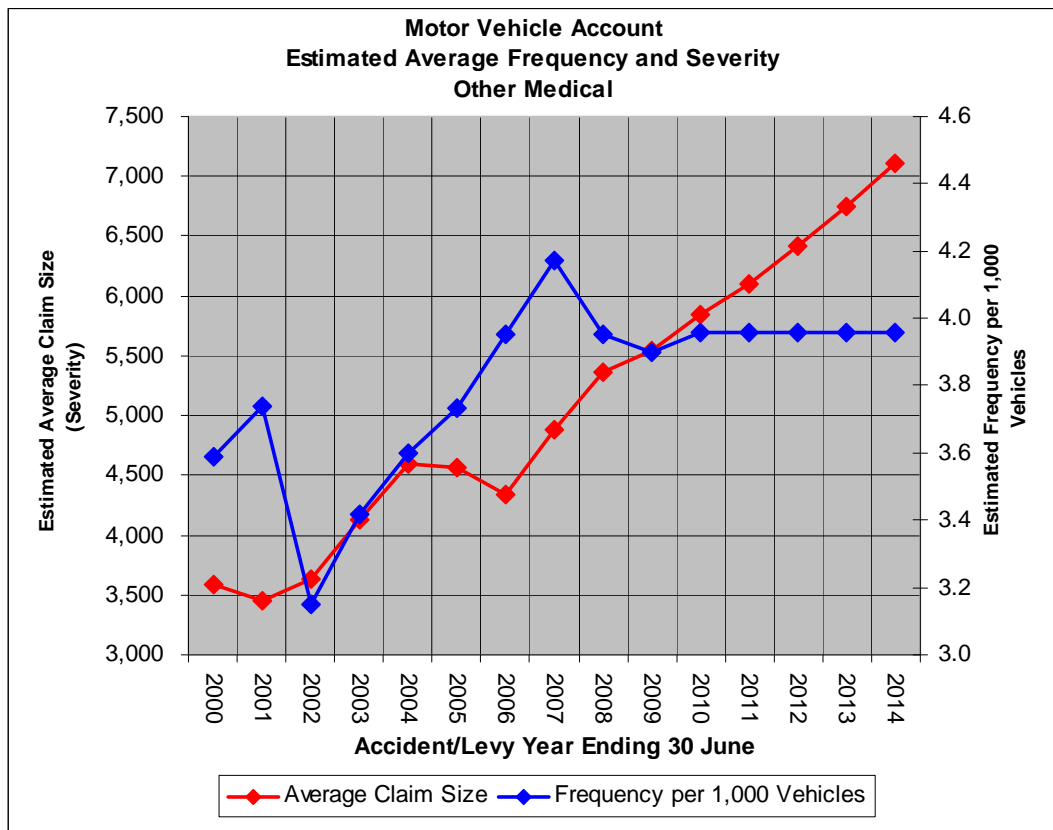
requiring recurring GP visits throughout the duration of the claim. Because fee rates paid to GPs are predicted to rise sharply over future years, this leads to a high average payment lag.

Applying the discount rate assumptions to the 2009/10 short term medical estimated nominal cashflows (totalling \$25 million) results in a present value full funding estimate for 2009/10 of approximately \$12 million. This corresponds to a cost per licensed motor vehicle of about \$4.

1.26.6.2 Other Medical (omed)

Other medical (omed) includes all medical costs except Bulk-Billed costs, smed (General Practitioners, Physiotherapists, Radiology) and Elective Surgery.

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



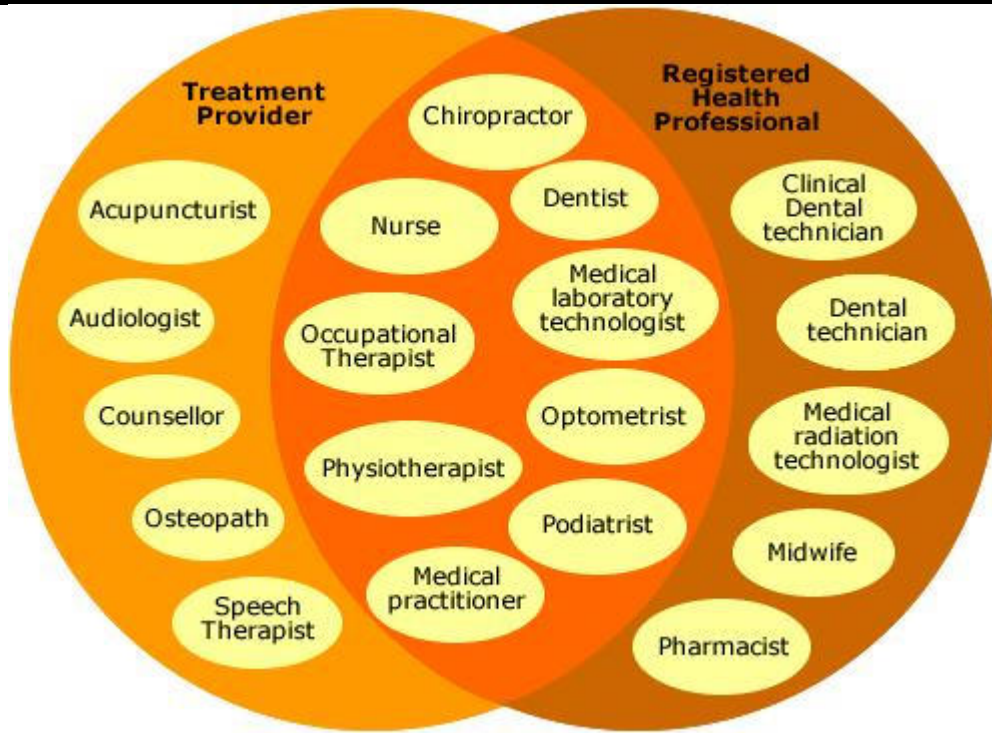
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Other Medical						
Accident Year ending 30 June	# Motor Vehicles	Projected		Indicated Statistics		
		Number of Claims	Ultimate Nominal Payments (\$000)	Frequency	Severity	Cost per Motor Vehicles
	[A]	[B]	[C]	[D]=[B]/[A]	[E]=[C]/[B]x1,000	[F]=[C]/[A]
2000	2,453	8,799	31,498	3.59	3,580	13
2001	2,476	9,257	31,970	3.74	3,454	13
2002	2,533	7,975	28,919	3.15	3,626	11
2003	2,637	9,020	37,185	3.42	4,123	14
2004	2,749	9,887	45,379	3.60	4,590	17
2005	2,846	10,618	48,534	3.73	4,571	17
2006	2,942	11,631	50,471	3.95	4,339	17
2007	3,013	12,572	61,395	4.17	4,883	20
2008	3,090	12,218	65,444	3.95	5,356	21
2009	3,112	12,139	67,318	3.90	5,546	22
2010	3,150	12,473	72,950	3.96	5,848	23
2011	3,188	12,624	77,030	3.96	6,102	24
2012	3,227	12,776	82,013	3.96	6,419	25
2013	3,266	12,930	87,319	3.96	6,753	27
2014	3,305	13,086	92,968	3.96	7,104	28

Period	Implied Annual Trends		
2000-2005	0.5%	6.5%	7.0%
2005-2009	0.9%	6.2%	7.1%
2010-2014	0.0%	5.0%	5.0%

Indicated accident year severities have been largely increasing since 2002, and especially since 2006. Similarly to smed, the increases in severities from 2005 are likely due to a number of increases in the ACC contributions to treatment providers. This was fuelled by the desire to comply with the International Labour Organisation (ILO) of which New Zealand is a member. Note comments above under smed.

In addition, ACC removed GPs as the sole gatekeeper in 1999. In particular (for this payment type) osteopaths and registered nurses were added as gatekeepers (those providers who can lodge claims). The diagram below summarises the health providers who can now lodge claims with ACC on behalf of a client. Easier access can result in greater volumes of claims. Claim frequencies have been volatile, but show signs of stabilising in recent years, and have been predicted to remain at current levels.



Severities are projected to continue increasing. ACC is currently attempting to control and rein back these increases. We have assumed future increases of 5.2% per annum (2.5% above long term LCI) to reflect health inflation historically running higher than LCI.

The estimated average payment lag for other medical is 37 years. Applying the discount rate assumptions to the 2010/11 other medical estimated nominal cashflows (totalling \$77 million) results in a present value full funding estimate for 2010/11 of approximately \$20 million. This corresponds to a cost per licensed motor vehicle of about \$6.50.

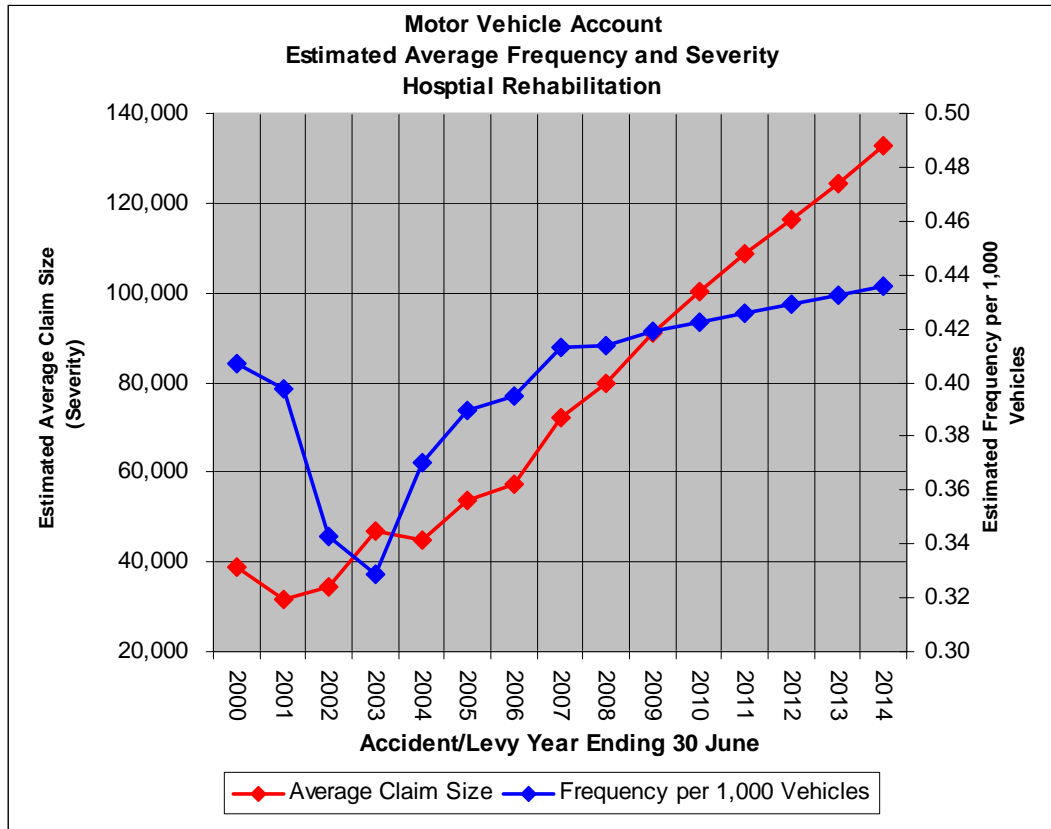
1.26.7 Public Health Acute Services

This covers costs relating to acute inpatient care; emergency department; outpatient; Miscellaneous Purchasing Units; Community trusts; Tertiary Adjusters; High Complex Burns; Extreme Complex Burns; Pharmaceuticals; and Laboratories for accidental injuries.

The Motor Vehicle Account funds around \$67m (15%) of total PHAS costs for 2010/11. This corresponds to a cost per licensed motor vehicle of about \$20.

1.26.8 Elective Surgery

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Hospital Rehabilitation

Accident Year ending 30 June	# Motor Vehicles [A]	Projected		Indicated Statistics		
		Number of Claims [B]	Ultimate Nominal Payments (\$000) [C]	Frequency	Severity	Cost per Motor Vehicles
				[D]=[B]/[A]	[E]=[C]/[B]x1,000	[F]=[C]/[A]
2000	2,453	998	38,682	0.41	38,752	16
2001	2,476	984	31,076	0.40	31,581	13
2002	2,533	868	29,785	0.34	34,328	12
2003	2,637	867	40,694	0.33	46,915	15
2004	2,749	1,018	45,769	0.37	44,948	17
2005	2,846	1,109	59,727	0.39	53,847	21
2006	2,942	1,161	66,594	0.39	57,357	23
2007	3,013	1,244	89,731	0.41	72,132	30
2008	3,090	1,279	102,202	0.41	79,928	33
2009	3,112	1,305	118,738	0.42	90,968	38
2010	3,150	1,331	133,707	0.42	100,434	42
2011	3,188	1,358	147,419	0.43	108,569	46
2012	3,227	1,385	161,319	0.43	116,483	50
2013	3,266	1,413	175,559	0.43	124,288	54
2014	3,305	1,441	191,056	0.44	132,615	58

Period	Implied Annual Trends		
2000-2005	-1.3%	9.0%	7.6%
2005-2009	2.0%	14.8%	17.1%
2010-2014	0.8%	7.2%	8.0%

Frequencies have risen from 2003 to 2007. Changes to the elective surgery process have reduced these recently and future frequencies are expected to flatten out. Although requests for surgery continue to grow, ACC's elective surgery unit has tightened requirements to better identify requests that are not injury related. This has resulted in a higher rate of claims being declined. The increase in the decline ratio is expected to partially offset the increased demand for surgery.

Over the past four years the rate of growth in the average elective surgery severity has run between 5%-8% per annum in excess of wage inflation. Investigations to understand these high growth rates led to the following information:

- Funding arrangements in place in 2006-2008 between hospitals, surgeons, and the ACC resulted in a sharp increase in average claim costs of over 10% each year. This was due to access to a supplementary budget for complex surgeries. The number of orthopaedic surgeries coded as "complex" increased over this period.
- Excluding the effect of the complex surgeries, the historical inflation averages remains high at 6% - 7% per annum.
- The majority of implants and other surgical parts are imported into New Zealand, therefore the cost of these purchases exposes ACC to currency exchange risk. Since 2003, the impact of changes in exchange rates on the cost of implants has averaged approximately 7% per annum above normal product rate changes.
- The demand for theatre space and surgeons creates a leveraged bias favouring the supplier rather than purchaser. It is not anticipated this imbalance will subside in the short term, and although not fully sustainable in the long term at 8% above wage inflation, it is anticipated in the long run the annual increases in surgery costs will maintain a reasonable margin above normal inflation.

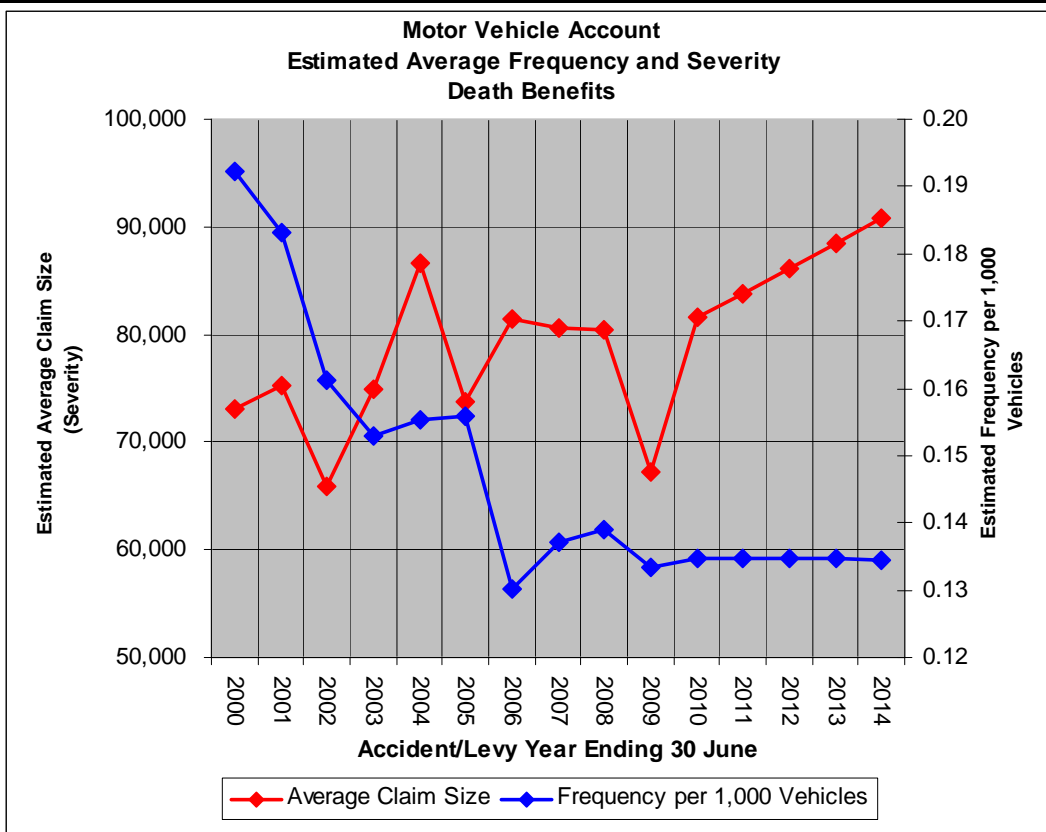
The long term inflation rate selected for elective surgery is anticipated to run 3% above long term LCI, eventually resulting in a "ground up" inflationary trend of 6.7%.

The estimated average payment lag for elective surgery is 40 years. Applying the discount rate assumptions to the 2010/11 elective surgery estimated nominal cashflows (totalling \$147 million) results in a present value full funding estimate for 2010/11 of approximately \$32 million. This corresponds to a cost per licensed motor vehicle of about \$10.

1.26.9 Death Benefits

The benefits provided under this payment type include funeral grants, survivor grants and fatal weekly compensation paid to spouse/partners and dependants.

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Death

Accident Year ending 30 June	# Motor Vehicles [A]	Projected		Indicated Statistics		
		Number of Claims [B]	Ultimate Nominal Payments (\$000) [C]	Frequency [D]=[B]/[A]	Severity [E]=[C]/[B]x1,000	Cost per Motor Vehicles [F]=[C]/[A]
2000	2,453	472	34,528	0.192	73,158	14.1
2001	2,476	453	34,102	0.183	75,239	13.8
2002	2,533	408	26,926	0.161	65,950	10.6
2003	2,637	403	30,216	0.153	74,919	11.5
2004	2,749	427	36,943	0.155	86,570	13.4
2005	2,846	443	32,666	0.156	73,697	11.5
2006	2,942	383	31,166	0.130	81,386	10.6
2007	3,013	413	33,316	0.137	80,614	11.1
2008	3,090	429	34,518	0.139	80,373	11.2
2009	3,112	415	27,895	0.133	67,201	9.0
2010	3,150	424	34,606	0.135	81,603	11.0
2011	3,188	429	35,966	0.135	83,806	11.3
2012	3,227	434	37,380	0.135	86,069	11.6
2013	3,266	440	38,850	0.135	88,393	11.9
2014	3,305	445	40,377	0.135	90,779	12.2

Period	Implied Annual Trends		
2000-2005	-4.5%	1.7%	-2.9%
2005-2009	-2.4%	-2.0%	-4.3%
2010-2014	0.0%	2.7%	2.7%

There has been a considerable decrease in the number of Motor Vehicle claims receiving death benefits over past years. It is believed that this is because motor vehicle accidents previously resulting in deaths are now resulting in serious injuries. This fall in claims receiving death benefits has lessened in recent years, so it is assumed that death benefits will increase with the number of vehicles from now on.

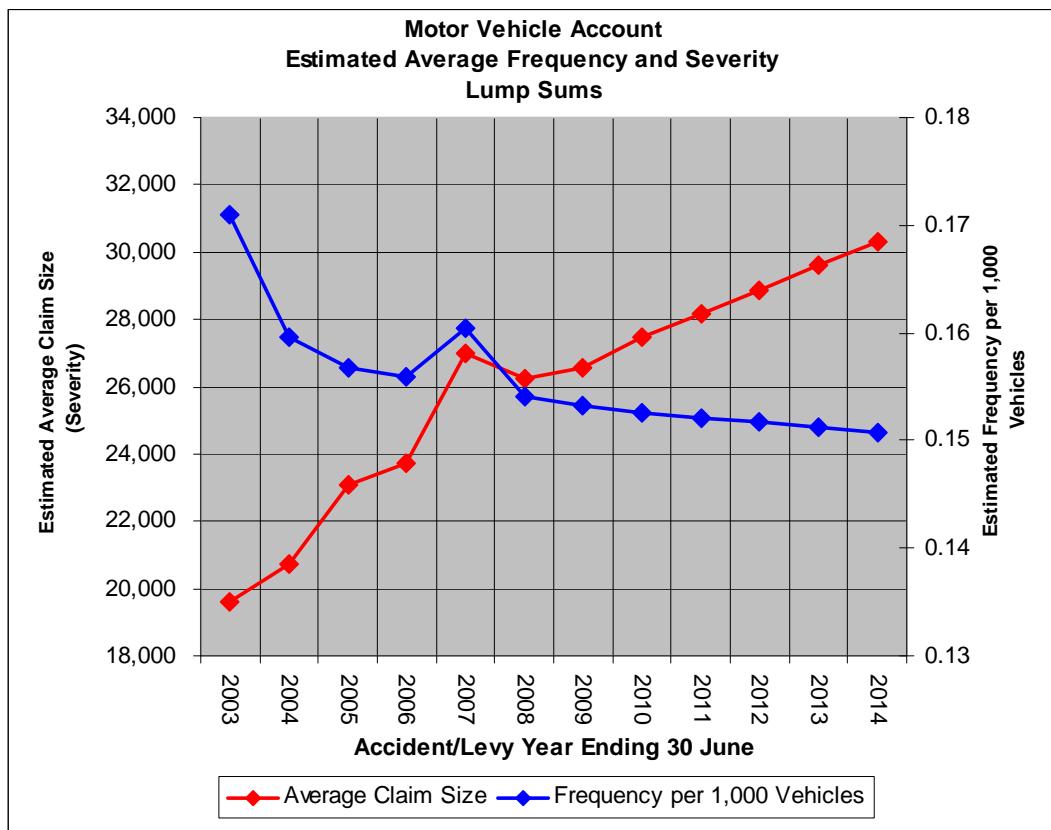
Severity, on the other hand, has been increasing. The growth in severity is below the long term AWE growth rate (3.5%) at which weekly compensation payments should be expected to grow. This is due to the mix of entitlements in this payment type including funeral grants, survivors grants and child care payments the rates for which are all indexed annually at CPI (2.5%).

The estimated average payment lag for death benefits is 9 years. Applying the discount rate assumptions to the 2010/11 death benefit estimated nominal cashflows (totalling \$36 million) results in a present value full funding estimate for 2010/11 of approximately \$25 million. This corresponds to a cost per licensed motor vehicle of about \$8.

1.26.10 Independence Allowance and Lump Sums

In 2002, legislation was introduced to replace the payment of a regular independence allowance with a lump sum benefit. Lump sum benefits apply for all claims with a date of injury after 31 March 2002.

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Independence Allowance & Lump Sums

Accident Year ending 30 June	# Motor Vehicles	Projected		Indicated Statistics		
		Number of Claims	Ultimate Nominal Payments (\$000)	Frequency	Severity	Cost per Motor Vehicles
	[A]	[B]	[C]	[D]=[B]/[A]	[E]=[C]/[B]x1,000	[F]=[C]/[A]
2000	2,453	461	34,441	0.188	74,730	14.0
2001	2,476	410	24,693	0.165	60,294	10.0
2002	2,533	418	21,216	0.165	50,806	8.4
2003	2,637	451	8,837	0.171	19,606	3.4
2004	2,749	439	9,099	0.160	20,747	3.3
2005	2,846	446	10,306	0.157	23,092	3.6
2006	2,942	459	10,889	0.156	23,741	3.7
2007	3,013	483	13,056	0.160	27,011	4.3
2008	3,090	476	12,485	0.154	26,217	4.0
2009	3,112	477	12,662	0.153	26,562	4.1
2010	3,150	481	13,211	0.153	27,473	4.2
2011	3,188	485	13,660	0.152	28,160	4.3
2012	3,227	489	14,125	0.152	28,864	4.4
2013	3,266	494	14,605	0.151	29,586	4.5
2014	3,305	498	15,102	0.151	30,326	4.6

Period	Implied Annual Trends		
2000-2005	-2.7%	-24.9%	-27.0%
2005-2009	-0.6%	3.9%	3.3%
2010-2014	-0.3%	2.5%	2.2%

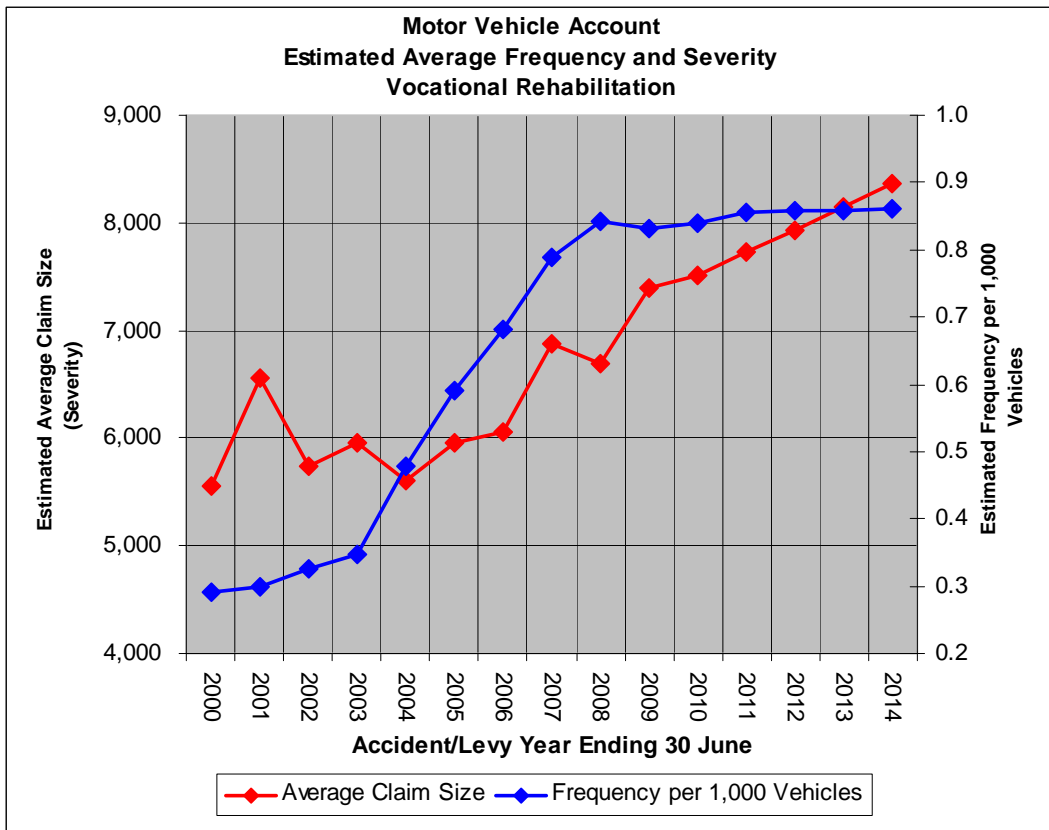
The combined independence allowance and lump sum frequencies have been slowly increasing since 2005, at a similar rate to the number of motor vehicles.

The payments are indexed each year by the CPI index. The large drop in severity from 2002 to 2003 is due to the switch from independence allowance to lump sum payments; given that motor vehicle injuries are often severe, independence allowance payments tend to be higher per claim as they may be received in perpetuity. Since 2003, severity has been increasing relatively quickly, but has stabilised in very recent years. Future severity has been projected to increase at the future rate of CPI.

The estimated average payment lag for lump sum and independence allowance combined is 5 years. Applying the discount rate assumptions to the 2010/11 lump sum and independence allowance combined estimated nominal cashflows (totalling \$14 million) results in a present value full funding estimate for 2010/11 of approximately \$10 million. This corresponds to a cost per licensed motor vehicle of about \$3.30.

1.26.11 Vocational Rehabilitation

The graph and table below show the indicated accident year frequencies and severities based on estimated historical and projected ultimate number of claims and ultimate nominal claim payments.



Vocational Rehabilitation

Accident Year ending 30 June	# Motor Vehicles [A]	Projected		Indicated Statistics		
		Number of Claims [B]	Ultimate Nominal Payments (\$000) [C]	Frequency [D]=[B]/[A]	Severity [E]=[C]/[B]x1,000	Cost per Motor Vehicles [F]=[C]/[A]
2000	2,453	714	3,969	0.29	5,555	1.6
2001	2,476	743	4,878	0.30	6,562	2.0
2002	2,533	823	4,728	0.33	5,743	1.9
2003	2,637	918	5,458	0.35	5,949	2.1
2004	2,749	1,313	7,360	0.48	5,603	2.7
2005	2,846	1,682	10,009	0.59	5,949	3.5
2006	2,942	2,008	12,154	0.68	6,052	4.1
2007	3,013	2,373	16,331	0.79	6,883	5.4
2008	3,090	2,600	17,395	0.84	6,690	5.6
2009	3,112	2,589	19,151	0.83	7,398	6.2
2010	3,150	2,641	19,853	0.84	7,517	6.3
2011	3,188	2,730	21,083	0.86	7,722	6.6
2012	3,227	2,767	21,944	0.86	7,931	6.8
2013	3,266	2,804	22,840	0.86	8,145	7.0
2014	3,305	2,842	23,773	0.86	8,365	7.2

Period	Implied Annual Trends		
2000-2005	15.4%	-0.3%	15.0%
2005-2009	9.3%	5.5%	15.4%
2010-2014	0.5%	2.7%	3.3%

Recent experience has shown a large increase in the number and severity of claims since 2003.

The increase in the frequency of vocational rehabilitation corresponds to the increase in the frequency of non-fatal weekly compensation, along with the subsequent stabilisation. This is expected, as vocational rehabilitation payments are closely related to weekly compensation payments. Future numbers of claims have been predicted to

remain around current levels, which is in line with projections of weekly compensation claim numbers.

It should also be noted that the increases in frequency and severity of claims include increases beyond 2005, when Work Hardening Programmes were introduced.

Work Hardening Programmes were formerly part of the activity-based programmes suite which is grouped under the Medical Treatment forecast group. Work Hardening Programmes were created as a distinct suite of programmes and were moved to the vocational rehabilitation entitlements in the system.

Despite the name, the programme is an exercise programme aimed at strengthening clients physically - either for work tasks or to achieve independence. It is used where pain is not a disabling factor.

This has contributed to increases in the past number and cost of Vocation Rehabilitation claims in the Motor Vehicle Account. In very recent experience, up to 60% of claimants who have received weekly compensation have also received vocational rehabilitation. This ratio appears high in terms of the proportion of injured workers requiring retraining for future employment. The projected stabilisation of claim numbers takes into account the current full use of vocational rehabilitation programme. It is not realistic to expect the claim rate in vocational rehabilitation will continue to grow without corresponding growth in the weekly compensation claim rate.

Costs for vocational rehabilitation are projected to increase in line with LCI at 2.7%.

The estimated average payment lag for vocational rehabilitation is 16 years. Applying the discount rate assumptions to the 2010/11 vocational rehabilitation combined estimated nominal cashflows (totalling \$21 million) results in a present value full funding estimate for 2010/11 of approximately \$10 million. This corresponds to a cost per licensed motor vehicle of about \$3.40.

1.26.12 Other Rehabilitation

Other rehabilitation costs previously comprised payments which do not fit into any of the other payment categories. These included:

- Death benefit grants and child care payments
- Dental treatment
- Transport costs to treatment (other than ambulance costs)
- Miscellaneous payments.

This group has now been split up and reallocated: death benefits are now being modelled separately; dental treatment is being modelled with other medical treatment; transport costs are modelled with the payment type they are associated with i.e. travel for either medical, social rehabilitation or vocation rehabilitation; miscellaneous payments (mainly

backdated attendant care) are now modelled separately and grouped with social rehabilitation.

This reallocation was made to better align the different costs with similar benefits.

Future Improvements

During the latest review there have been improvements in our analysis and methodology with an aim at better understanding the key trends driving the account's claim activity. We have performed an accident year analysis reviewing frequency separately from severity. This is a step in the right direction however, we indeed realize there are more improvements to be made. Below is a list of some of the improvements we would like to make in our analysis and methodology prior to our next review.

- Improve our understanding of changes in historical frequencies and severities in particular due to changes in legislation, rates, and material operational changes. This will improve our on levelling calculation.
- Where appropriate and credible, breakdown the analysis to lower levels of detailed components.
- Improve our projection of exposures by improving our understanding of potential changes in the population and economy and how changes in such affect claim frequency and severity.
- Improve our understanding of the causes of accidents resulting in serious injuries.
- Improve our analysis in projecting future inflationary trends and rate increases of medical and social rehabilitation services.
- Add more methods to our analysis at an aim of understanding the range of possible outcomes projected in the future.
- Improve our measurement of the variability around our expected estimates taking into account correlations between components of the analysis.