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CONSULTING ACTUARIES

19 March 2012

Actuarial Report as at 30 June 2011

Police Superannuation Scheme

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Executive Summary

1.1. We have prepared this report at the request of the Minister, to satisfy the requirements of Section 15 of the Police Superannuation Act, 1990. This Section of the Act requires an Actuary to provide a report to the Minister:

(a) on the cost of the Police Superannuation Scheme to the State Government at the time of the report and in the foreseeable future, and

(b) estimating the proportion of future benefits under this Act that can be met from the Fund.

1.2. This report continues the series of reports that have been prepared to address these issues in the past. These reports have been prepared on a regular basis, generally every three years, and have provided information about the funding and cost of the superannuation scheme which is used for members of the police force in South Australia.

1.3. The previous report was prepared by Stuart Mules of Mercer (Australia) Pty Ltd as at 30 June 2008, with that report dated 13 March 2009.

1.4. We have prepared this report with the assistance of Mr John Barrett, Actuarial Officer, Department of Treasury and Finance. We have used computer analyses prepared by Mr Barrett, which derive their information from the administration computer system that is used by the Police Superannuation Board. We have been grateful for the assistance provided in this exercise and for access to his extensive knowledge of the operations of the Scheme.

1.5. In this report, we have:

- provided information about the current funding status of the Scheme,
- commented on the funding proportion of benefit payments, and
- produced estimates of the future cost of the Scheme.

1.6. The major conclusions which we have made in this report are that -

(i) the funding proportion for the Scheme should be increased from 17.5% to 19.0%, and

(ii) the Government contribution for future service liabilities for the Scheme be maintained at 20.5% of contributors' salaries.

1.7. We confirm that this Report has been prepared to comply with Professional Standard PS400 of the Institute of Actuaries of Australia, relating to the Investigation of Defined Benefit Superannuation Funds. Where requirements of the Standard are not relevant or appropriate for the Scheme, we have omitted them.

2

Legislation Affecting the Scheme

Governing Legislation

2.1. The Police Superannuation Scheme is governed by the Police Superannuation Act, 1990 ("the Act"), which replaced the Police Pensions Act, 1971.

2.2. Under the Act, members who joined the Scheme before 1 June 1990 are able to receive benefits in pension form. Members who joined the Scheme on or after 1 June 1990 were transferred to the Triple S Scheme effective 1 July 2008. An overview of the benefits and contributions under the current legislation is provided in Appendix A.

Amendments to Legislation

2.3. Since the time of the previous report, there have been only minor technical amendments to the Act which had no impact on the liabilities of the Scheme.

Superannuation Surcharge

2.4. The "Superannuation Surcharge" is a tax which was introduced by the Federal Government from 20 August 1996. The Surcharge was applied to this Scheme in the form of a "debt account" for affected members. That debt account is accumulated with the long term (Federal) Treasury bond rate until the person becomes eligible for a benefit entitlement under the Act, at which time the accumulated balance is required to be paid to the Australian Tax Office.

2.5. Legislation was passed which has abolished the Surcharge with effect from 30 June 2005.

3

Funding of the Scheme

Member Contributions

3.1. Scheme members who joined after their 30th birthday contribute at 6% of salary, while members who joined before their 20th birthday contribute at 5% of salary. Contribution rates decrease from the level of 6% of salary to 5% of salary for members who joined between these ages.

3.2. The average rate of member contribution for current members at 30 June 2011 was 5.2% for the Scheme. These member contributions are paid by the Treasurer into the Police Superannuation Fund. This Fund is managed and invested by Funds SA (the business name of the Superannuation Funds Management Corporation of South Australia).

3.3. The Fund is required to meet its share of administration costs and benefit payments.

Funding of Public Sector Superannuation

3.4. Since 1 July 1994, the State Government has undertaken a program that is intended to progressively fund its accumulated superannuation liabilities. This program has been set out over a 40 year period, with the intention of achieving complete funding of accumulated superannuation liabilities by the year 2034.

3.5. This program will produce a specific pool of externally invested assets, which are currently managed by Funds SA. These assets are maintained in distinct accounts for each of the State schemes that are supported by the State Government. The assets of the Police Superannuation Scheme – Employer Contribution Account are shown in the table in paragraph 4.1 below.

3.6. The payments that are being made into the investment pool are intended to meet the cost of newly accruing benefits each year, as well as to meet a portion of the existing past service liability.

3.7. During the three years to 30 June 2011, total payments of $161,900,000 were made in respect of the past service liability for members of the Police Superannuation Scheme. These contributions are paid into Employer Account for the Scheme and are not taken into account in setting the future contribution levels or funding proportions.

Cost Sharing Proportion

3.8. The proportion of benefits met from the Fund is set by the Board under sub-section 14(3) of the Act. This is effectively the proportion of lump sum and pension benefits that must be funded out of the assets held in the Police Superannuation Fund. As mentioned in paragraph 1.1, this report must provide an estimate of the proportion.

3.9. The prescribed proportion is 100% for all resignations involving a return of the member's contribution account balance (with the balance of this benefit being fully met by the Government). For other types of entitlement, a different prescribed proportion applies.

3.10. The prescribed proportion is currently 17.5%. This means that the Government is responsible for meeting the remaining 82.5% of benefits at the time a member is paid their benefit. The Government's share of the benefit is met from the assets of the Employer Account.

Share of Administration Costs

3.11. Regulation 12, pursuant to Section 10(7)(b) of the Act, specifies the proportion of administration costs that must be met by the Fund. The balance of these costs is met by the Government. The prescribed percentage is 30%.

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Assets of the Fund

Details of Assets

4.1. At 30 June 2011, the assets of the Fund and the Employer Account were invested with Funds SA in the following major asset classes:

Asset Type	Fund ($'000)	Employer Account ($'000)	Total ($'000)
Inflation Linked Investments	31,574	46,982	78,556
Property	46,824	69,675	116,499
Equities – Australian	100,341	149,309	249,650
Equities – International	83,722	124,580	208,302
Long Term Fixed Interest	9,429	14,031	23,460
Short Term Fixed Interest	6,350	9,449	15,799
Diversified Strategies – Growth	18,753	27,905	46,658
Diversified Strategies – Income	34,056	50,676	84,732
Cash	12,633	18,798	31,431
Total Investments	**343,682**	**511,405**	**855,087**
Other Assets and Liabilities	239	918	1,157
NET ASSETS TO PAY DEFINED BENEFITS	**343,921**	**512,323**	**856,244**

4.2. At 30 June 2008 the net assets were $347.2 million for the Fund and $437.1 million for the Employer Account.

4.3. The amount held in the Employer Account is intended to be used for the purpose of paying the Government's share of the benefits as they fall due.

4.4. We have used the market value of the assets of the Fund for the purposes of our projections and assessment of the funding position of the Scheme. We consider that the market value is reasonable for this purpose, and this represents a continuation of the practice from previous reports.

Returns on Investments

4.5. One of the major objectives which Funds SA has for the management of the assets of the State's defined benefit public sector superannuation schemes is the achievement of long term returns which are 4.5% per annum in excess of inflation. The assumptions that we have used to assess the financial position and emerging cost of the Scheme are consistent with this objective.

4.6. The assets of the Scheme have a significant emphasis on "growth" investments, which is consistent with the objective of achieving a high real rate of return. One of the results of this emphasis on "growth" investments is that returns will be variable over different years, as Australian and international markets fluctuate over time.

4.7. Rates of return on the assets for the Scheme (money weighted), allowing for investment fees, for the last three years have been:

	2008/09	**2009/10**	**2010/11**
Investment return	-17.6%	12.2%	11.3%

These rates of return were used to credit member contribution accounts.

4.8. Over the three years ending 30 June 2011, the average rate of return on the assets has been 1.0% per annum. This compares with the expected return for the three years at the previous review of -1.9% per annum. Although investment returns were greater than expected, they are well below the expected long term return of 7.0%.

5

Valuation Assumptions

5.1. This actuarial investigation involves using a model to project the experience of the members of the Scheme and the balance of the Fund into the future. The model allows for demographic factors (including rates of mortality, retirement, invalidity and resignation) and economic factors (including rates of investment returns, crediting rates and inflationary increases in benefits) as well as other factors such as rates of pension commutation and preservation.

5.2. We have used a projection and funding method known as "aggregate funding", that involves calculating the present value of all liabilities relating to present contributors, pensioners and preserved members, and comparing the prescribed proportion of this with the present value of future member contributions together with the value of the Fund's investments.

Economic Assumptions

5.3. Assumptions are required to be made about future crediting rates, salary increases and CPI increases. These assumptions are inter-related, since it would be expected that crediting and earning rates should normally be higher than salary increases, which in turn should be higher than CPI increases.

5.4. For the purpose of this investigation, we have retained the same long-term assumptions as applied in the previous valuation as at 30 June 2008 for general salary increases, future investment returns and crediting rates and future CPI increases.

5.5. We have assumed a future general salary increase rate of 4% per annum. We have assumed that general salary increases will be 1.5% per annum in excess of CPI. We have assumed that investment returns will be 3.0% per annum in excess of general salary increases, resulting in a net investment return assumption of 7% per annum.

5.6. This "package" of assumptions produces an assumed real return of 4.5% above inflation in the long term and is consistent with the objectives of Funds SA and the real return used at the previous investigation. The main variation to the individual assumptions is an explicit assumption for the first two years of the projection.

Short Term Economic Assumptions

5.7. Based on actual investment returns to 31 January 2012, we have assumed a return of 3.0% in 2011-12; which assumes a return of 7.0% pa for the remainder of the year.

5.8. We have allowed for the actual indexation of pensions at 1 October 2011, using an increase in the pensions of 4.0% for 2011-12 and 3.0% for 2012-13.

5.9. We have allowed for the immediate general increase in salaries of 3.5% that occurred on 1 July 2011. Since member contributions are based on the contributor's salary at the 1 April preceding the financial year, this will not affect the member contributions paid during the year, but will have an immediate effect on benefit entitlements. Future general salary increases at the long term assumption of 4% are also assumed to occur on 1 July each year.

Promotional Salary Increases

5.10. In addition to an assumed level of general salary increases, allowance is also made for promotional salary increases throughout a member's career. A promotional salary scale is derived from prior experience. Promotional salary increases were very close to the level assumed during the three year period to 30 June 2011, and so no changes were made to the existing promotional salary scale.

5.11. We also note that we expect that promotional increases will become less important over time as the membership ages.

Demographic Assumptions

5.12. The demographic assumptions that we have used in the projections and valuations were set after considering the experience of contributors and pensioners over the three year period to 30 June 2011, as well as the experience for prior periods. As the amount of experience for the Scheme is generally significant, the assumptions that are derived from the experience could be regarded as being reliable for the purpose of the calculations.

5.13. The experience observed over the three year period is summarised in Appendices C and D, while the assumptions adopted are summarised in Appendix E.

5.14. In general, we have retained the assumptions that were used in the previous valuation. In some cases, we have retained the major features of the assumptions, but used updated population mortality rates, which are based on more recent census and population experience in Australia.

5.15. The changes in assumptions related to:

- rates of mortality,
- rates of invalidity retirement,
- rates of age retirement,
- proportions of resignations electing a preserved benefit,
- proportions married,
- rates of commutation, and
- the age difference between male members and spouses,

We have provided a brief discussion of the changes made to the assumptions below. Details of the experience and the rates adopted are given in Appendices C, D and E.

Mortality

5.16. Mortality rates in the past have been linked to percentages of the standard population mortality based on Australian Life Tables. We have retained this approach for this investigation. We have based our calculations on Australian Life Tables 2005-07, the most recent tables and we have recognised that the mortality applies at a date prior to the valuation date. As a result, we have made allowance for improvements in mortality up to 30 June 2011 where the mortality improvement factors have been set equal to the average of the 25 and 100 year factors in Appendix E of the Australian Life Tables 2005-07. These factors are less than those assumed in the 2008 review.

Age Retirements

5.17. During the investigation period the trend towards lower rates of age retirement has continued. As a result, we have now reduced these rates in line with the experience observed. Also the number of members over age 60 has more than doubled. The valuation now allows for members to continue in service up to age 70 instead of age 60.

Proportions Married

5.18. Proportions married have been changed to reflect changes in the mortality assumptions.

Commutations

5.19. Allowance is made for pensioners and spouses to commute the pensions that they become entitled to. It was previously assumed that 25% of age and invalidity retirements and 5% of eligible spouses would commute their pensions to lump sums. As a result of experience over the last three years, the rate for age retirements has been decreased to 20%, for invalidity retirements has been reduced to 7.5% and for spouses has been reduced to 0%.

Expenses

5.20. Fund administration expenses have been valued based on a cost of $164 per annum per member. It has been assumed that administration expenses increase at the same rate as general salary inflation.

Impact of Changes in Assumptions

5.21. Changes in economic assumptions are usually more significant in their impact than changes to demographic assumptions. We have provided information about the effect of the economic and other changes on the valuation results in the next Section of the report.

5.22. Allowing for members continuing in service up to age 70 and lower mortality improvement factors have contributed to the surplus whereas lower rates of commutation have had a negative impact.

6

Valuation Results

Calculation of Funding Proportion

6.1. To assess the financial position of the Scheme, we have projected the future experience of current contributors and pensioners, and then discounted these benefit payments to the current date. The resulting values are the present value of projected liabilities for members of the Pension Scheme, the prescribed proportion (17.5% in this analysis) of which must be compared with the value of the assets in the Fund and the present value of future member contributions.

6.2. We have set out below the results of the calculations using the current prescribed proportion of 17.5% of these liabilities.

1. Present Value of Prescribed Proportion of Liabilities

	$'000	**$'000**
Current Contributors		
Age Retirements	217,570	
Invalidity Retirements	11,680	
Spouse and Children's Benefits	20,309	
Resignations with Cash Payments	176	
Expenses	2,063	251,798
Current Pensioners		
Age Retirements	67,358	
Invalidity Retirements	17,173	
Spouses and Children	30,864	
Expenses	1,101	116,496
Total Liabilities		**368,294**

2. Present Value of Assets

	$'000	**$'000**
Future Member Contributions	52,557	
Fund Investments as at 30 June 2008	343,921	
Total Assets		396,478
Surplus (Deficit)		**28,184**

6.3. These results show that, if the Fund is used to meet the prescribed proportion (17.5%) of benefit costs, the Fund is expected to eventually have surplus to its obligations. The present day value of this surplus of assets over liabilities is $28,184,000. This compares to a surplus of $5,226,000 at 30 June 2008 assuming the Fund share was 17.5% at that time, or a deficit of $75,820,000 if the Fund share had remained at 22.0%.

6.4. We understand that it is preferable for administrative purposes to round the prescribed proportion to the nearest 0.5%. If the prescribed proportion is increased to 19.0% the Fund will have a small deficit of $3,097,000. We have therefore recommended that the proportion of benefits that can be met from the Fund be increased from 17.5% to 19.0%.

Projected Long Term Cost of the Scheme

6.5. We have also considered the long term cost of supporting the benefits in respect of service after 30 June 2011. (Past service liabilities are being progressively funded by the State Government, as discussed earlier in this Report).

6.6. For this purpose, we have projected the future benefit payments based only on the future service of current contributors, and then discounted the projected benefit payments to the current date. The resulting values are the present value of the future service benefit liabilities.

6.7. We have shown the results of the calculations in the following table.

Present Value of Future Service Liabilities

	$'000	$'000
Age Retirements	251,432	
Invalidity Retirements	10,076	
Spouse and Children's Benefits	21,428	
Resignations with Cash Payments	41	
Expenses	2,088	
Total Liabilities		**285,065**
Future Member Contributions		52,557
Liability to be Funded by Government Contributions		**232,508**
Required Government Contribution Rate		**20.3%**

6.8. This means that, if an amount equivalent to 20.3% of contributors' salaries is set aside as a provision or invested each year, the projected future service benefits would be able to be totally met by those future provisions or investments together with future member contributions, based on the projection assumptions. This the same as the contribution rate determined at the 30 June 2008 actuarial investigations. We therefore recommend that Government contribution rate of 20.5% of contributor salaries be retained.

6.9. The main reason why the contribution rate has not changed is that the extra cost for lower retirements from age 50 to 54 was offset by an increase in members continuing in service after age 60.

Explanation of Change in the Financial Position of the Fund

6.10. We have analysed the change in the financial position, by considering the main contributing factors. These factors relate to both experience and changes in the valuation assumptions. This analysis is set out below.

6.11. The following table sets out the major influences affecting the change in the financial position between 30 June 2008 and 30 June 2011. The starting point of this analysis is the deficit of $75,820,000 at 30 June 2008 which was based on the previous funding proportion of 22%. The surplus of $28,184,000 arising in this valuation results in a net change of surplus of $104,004,000.

Influence	*Impact $m*
Experience	
Change in fund proportion from 22.0% to 17.5%	81.0
Interest on surplus	1.2
Investment Returns	31.1
Salary and promotional increases	(1.0)
Higher pension increases	(1.6)
Commutation profit	(3.7)
Other	3.3
Total Experience	**110.3**
Change in Valuation Assumptions	
Assumed investment return for 2011-12 of 3.0%	(11.7)
Changes to mortality, spouse age differences and proportion married assumptions	4.2
New age retirement rates, including allowing for members to continue in service up to age 70 instead of age 60	9.3
Changes to commutation assumptions	(5.5)
Short term higher salary inflation and pension increases	(1.4)
Reduction in partial invalidity assumption from 40% to 20%	(1.2)
Total Change in Valuation Assumptions	**(6.3)**
Net Change in Surplus	**104.0**

Note that these values have been rounded to the nearer $100,000 and this may result in a minor rounding error compared to the actual change in surplus.

6.12. The major surplus items above are discussed below:

- Change in fund proportion. Reflects the decrease in prescribed proportion from 22.0% to 17.5% following the deficit identified at 30 June 2008.
- Higher than expected investment returns were achieved as discussed in paragraph 4.8.
- Assumed investment return of 3.0% for the year ending 30 June 2012. This impact recognises the shortfall compared with the long term return of 7.0%.

Sensitivity Analysis

6.13. We have assessed the financial position of the Scheme under alternative scenarios as part of a sensitivity analysis. The alternative scenarios are a discount rate 0.5% higher and 0.5% lower than the assumed discount rate of 7.0%, and mortality decrements 10% higher and 10% lower than the assumed mortality rates. The results are shown in the following table.

	Surplus	Government Contribution Rate	Fund Prescribed Proportion
Discount rate			
0.5% lower	166	22.3	17.5%
Valuation assumptions	28,184	20.3	18.9%
0.5% higher	53,010	18.5	20.2%
Mortality decrements			
10% lower	32,146	20.5	18.6%
Valuation assumptions	28,184	20.3	18.9%
10% higher	23,903	20.1	19.1%

7

Projected Cost to the State Government

7.1. We have projected the cost of the Scheme using the assumptions described in this Report, assuming that the recommended cost sharing arrangements apply in the future. We have recommended that the State Government be responsible for meeting 81.0% of the cost of benefits for members of the Scheme, relative to the current funding proportion of 82.5%.

7.2. In the following table we have set out these projected costs (expressed in current salary terms) as well as the total cost of the Scheme, including member contributions.

Year Ended 30 June	State Government Cost $ m	Total Cost (incl member contributions) $ m
2012	56.2	69.5
2013	59.7	73.8
2014	61.8	76.4
2015	64.7	80.0
2016	67.4	83.3
2017	70.6	87.2
2018	73.5	90.8
2019	76.5	94.5
2020	78.3	96.8
2025	81.3	100.5
2030	77.1	95.2
2035	66.3	81.9
2040	55.6	68.7
2045	44.1	54.5
2050	32.1	39.7

8

Conclusions

8.1. In this Report, we have set out our comments about the funding status of the Police Superannuation Scheme.

8.2. We have concluded that the funding proportion of 17.5% should be increased to 19.0%. The Government contribution required to fund future service liabilities remain 20.5% of contributor salaries.

Geoffrey Keen	**Laurie Brett**
Fellow of the Institute of Actuaries of Australia	Fellow of the Institute of Actuaries of Australia

19 March 2012

Appendix A

Benefits and Contributions

Overview

A.1.1. The Police Superannuation Scheme is closed to new members.

A.1.2. This description of the Scheme is intended to provide a general understanding of the benefit entitlements of contributors to the Scheme. It is not intended to be a complete summary of the legislation.

A.1.3. There were two distinct types of benefit payable under the Scheme, those payable to:

- Pension members (Old Scheme members), being members who were accepted as contributors before 1 June 1990 and are the only members remaining in the Scheme; and

- Lump sum members (New Scheme members), being members who were accepted as contributors on or after 1 June 1990, and before the Scheme was closed to new contributors. As from 1 July 2008, all New Scheme members have been transferred to the Triple S Scheme.

A.1.4. Benefits previously payable under the Police Occupational Superannuation Scheme are now paid as an additional lump sum benefit under the Police Superannuation Scheme. The merger of the occupational scheme into the Police Superannuation Scheme was effective from 1 July 2001. This additional benefit is equivalent to 2.275% of final salary for each year of service for Old Scheme members.

A.1.5. Benefits are based on contribution points. One contribution point is awarded for each month of contribution, with proportional points awarded for part-time employees.

A.1.6. Members contribute at a constant contribution rate, based on their age at the time of entry to the Scheme. Member contribution rates are:

Age at Commencement	Old Scheme Contribution Rate
less than 20	5.0%
20	5.1%
21	5.2%
22	5.3%
23	5.4%
24	5.5%
25	5.6%
26	5.7%
27	5.8%
28	5.9%
29 and over	6.0%

A.1.7. Members who hold the rank of senior sergeant or a lower rank and who have worked on rostered shifts during the contribution period will have their salary increased by 10% for the purpose of determining contributions and benefits.

Old Scheme - Pension Benefits

Retirement Benefits

A.2.1. The retirement age is 55 for most members. A contributor who has reached this age is entitled to a pension and a lump sum.

(i) The pension is calculated as:

$$P = FS \times A \times \frac{2}{3} \times \mathrm{K} \times \left(1 + \frac{X}{600}\right)$$

FS	is	the contributor's actual or attributed salary;
A	is	the lesser of 1.0 and the numerical value obtained by dividing the number of the contributor's accrued contribution points by 360 or, if the contributor has not reached age 60, the total of 300 and the number of months by which the contributor's age exceeds 55;
X	is	the number of months by which the contributor's age at retirement exceeds age 60;
K	is	a reduction factor which varies with the contributor's age at retirement.

(ii) The lump sum is calculated as:

$$LS = Pn\left(\frac{FS \times 0.91 \times M}{480}\right)$$

FS	is	the contributor's actual or attributed salary;
M	is	the number of months of the contribution period after 31 December 1987;
Pn	is	the proportion of full-time employment during that part of the contribution period after 31 December 1987.

Early Retirement Benefits

A.2.2. A contributor who retires between age 50 and 55 is entitled to a lump sum benefit calculated as follows:

$$LS = 5.4545 \times A \times FS \times \left(1 + \frac{0.1667 \times X}{100}\right) + Pn\left(\frac{FS \times 0.91 \times M}{480}\right)$$

FS	is	the contributor's actual or attributed salary;
A	is	the lesser of 1.0 and the numerical value obtained by dividing the number of the contributor's accrued contribution points by 360;
X	is	the number of months by which the contributor's age at retirement exceeds age 50.
M	is	the number of months of the contribution period after 31 December 1987;
Pn	is	the proportion of full-time employment during that part of the contribution period after 31 December 1987.

Retrenchment Benefits

A.2.3. A contributor who has contributed to the Old Scheme for more than five years is entitled on retrenchment to receive a pension equal to the member's accrued pension and a lump sum.

Disability Pensions

A.2.4. A contributor who is temporarily or permanently incapacitated for work, who is not eligible for weekly workers compensation payments and who has used all available sick leave credits, is entitled to a temporary disability pension. The pension will not be paid for periods of less than one week, and may not be paid if the incapacity is expected to last less than six months. Usually the temporary disability pension will be paid for a maximum of twelve months.

The amount of the pension is calculated as follows:

$$P = A \times \frac{2}{3} \times FS$$

FS	is	the contributor's actual or attributed salary;
A	is	calculated in the same manner as for the retirement benefit at age 60 but with prospective service to age 60 being included.

While a temporary disability pension is being paid, a contributor is not required to make contributions to the Scheme.

Invalidity Benefits

A.2.5. When a contributor's employment is terminated because of invalidity, an invalidity benefit is payable. Where the incapacity is assessed as being likely to be permanent and at a level of 60% or more, the contributor is entitled to:

(i) a pension at the same level as the age 60 pension entitlement; and
(ii) a lump sum benefit.

Where the contributor's condition does not satisfy this requirement, a lump sum benefit is paid, equal to:

$$LS = 5.4545 \times A \times FS \times \left(1 + \frac{0.1667 \times X}{100}\right) + Pn\left(\frac{FS \times 0.91 \times M}{480}\right)$$

with a minimum of twice actual or attributed salary.

FS	is	the contributor's actual or attributed salary;
A	is	the lesser of 1.0 and the numerical value obtained by dividing the number of the contributor's accrued contribution points by 360;
X	is	the number of months by which the contributor's age at invalidity retirement exceeds age 50.
M	is	the number of months of the contribution period after 31 December 1987;
Pn	is	the proportion of full-time employment during that part of the contribution period after 31 December 1987.

Pensions Payable on Death of a Contributor

A.2.6. When a contributor dies, a surviving eligible spouse is entitled to a pension equal to two-thirds of the deceased contributor's notional pension, and if employed at death, a lump sum equivalent to the lump sum payable on retirement.

Children of a deceased contributor who are under the age of sixteen years, or who are undertaking full-time study and are under the age of twenty five years, are eligible for children's pensions. The rate of pension paid is dependent on the number of eligible children and on whether a spouse's pension is also payable.

Where a spouse's pension is payable, children's pensions vary from one ninth of the contributor's notional pension for one child to a maximum of one third of the contributor's notional pension divided among three or more eligible children.

Where no spouse's pension is payable, an orphan's benefit is payable varying from 45% of the decreased contributor's notional pension for one child to a maximum equal to 100% of the deceased contributor's notional pension divided among three or more eligible children. If employed at death, a lump sum equal to the greater of the balance of the contributor's contribution account and twice the contributor's final salary plus a lump sum equivalent to the lump sum payable on retirement. Otherwise a lump sum is paid equal to the balance of the contributor's contribution account.

Where no spouse or child pension is payable, a lump sum is payable equal to 7 times the actual or attributed salary reduced by the factor 'A' as used for early retirement benefit calculations plus a lump sum equivalent to the lump sum payable on retirement. If the contributor dies in the course of duty the minimum benefit is 3 times the actual or attributed salary.

Resignation Benefits

A.2.7. On resignation, contributors may elect either to receive a cash lump sum equal to a return of their contributions with interest, or to preserve their benefit until retirement at or after age 55. Preserved benefits include full vesting of the employer share of benefits.

A.2.8. If contributors elect to receive a cash lump sum, they are also entitled on retirement to a preserved lump sum consisting of a Superannuation Guarantee Minimum Requisite Benefit, and a component calculated as:

$$Pn\left(AFS \times \frac{0.91}{480} \times M\right)$$

AFS	is	the contributor's actual or attributed salary on resignation adjusted for changes in the CPI since the date of resignation;
M	is	the number of months of the contribution period from 1 January 1988 to 30 June 1992;
Pn	is	the proportion of full-time employment during that part of the contribution period from 1 January 1988 to 30 June 1992.

This preserved lump sum may also transferred to an approved fund, or paid on resignation if less than $200 in value.

A.2.9. Where contributors elect to preserve their entitlements, the form of the benefit is determined by the contributor's length of contributory membership before resignation. For contributors with ten years or more membership, the benefit is in the form of a pension and lump sum, while for contributors with less than ten years membership, the benefit is in the form of a lump sum.

A.2.10. The lump sum preserved benefit for less than ten years membership consists of:

(i) an amount equivalent to the amount standing to the credit of the contributor's contribution account; and

(ii) an employer component equal to $2\,^{1}/_{3}$ times the balance of the contribution account; and

(iii) a lump sum calculated as:

$$LS = Pn\left(\frac{AFS \times 0.91 \times M}{480}\right)$$

AFS	is	the contributor's actual or attributed salary on resignation adjusted for changes in the CPI since the date of resignation;
M	is	the number of months of the contribution period after 31 December 1987;
Pn	is	the proportion of full-time employment during that part of the contribution period after 31 December 1987.

A.2.11. The preserved benefits for more than ten years membership consist of:

(i) a pension equal to:

$$P = 0.5181 \times A \times AFS$$

AFS	is	the contributor's actual or attributed salary at the date of resignation, adjusted for changes in CPI to the date of commencement of pension payment;
A	is	the numerical value obtained by dividing the number of the contributor's accrued contribution points by the greater of 300 and the number of months between the age at entry and 55.

and;

(ii) a lump sum equivalent to the benefit in part (iii) of A.2.10 above

Commutation

A.2.12. On commencement of an invalidity pension, up to 10% of the pension may be commuted for a lump sum, with further commutation available at age 55. Full commutation is available for retirement pensions. On attainment of age 55 in the case of invalidity or retrenchment pensioners, up to 50% of a pension entitlement may be commuted for a lump sum. The commutation basis is independent of sex or marital status, with the factor varying by age. The table below shows the amount of lump sum for each $1.00 of pension commuted.

Age	Factor
65	$9.50
64	$9.70
63	$9.90
62	$10.10
61	$10.30
60	$10.50
59	$10.70
58	$10.90
57	$11.10
56	$11.30
55 or less	$11.50

Spouses of deceased contributors have similar initial options to commute their pension entitlements. Commutation rates are $11.50 at ages below 50 reducing to $8.50 at age 65 and continuing to reduce progressively at older ages.

Indexation of Pensions

A.2.13. Indexation of pension payments occur at 1 October and 1 April each year, using the rate of change in the Consumer Price Index for Adelaide for the 6 month period to the last June and December quarter respectively. All pensions which commenced to be paid under the Police Pensions Act, 1971 are indexed at 1 1/3 times the change in the CPI index. Prior to April 2002, pensions were only adjusted in October.

Appendix B

Membership Information

B.1 BACKGROUND

We have been able to use the membership data that has been extracted from the administration system used by the Police Superannuation Board for the ongoing administration of the Schemes.

We have been able to satisfy ourselves that the data is sufficiently accurate for the purpose of our calculations, and consider that any errors in the recording of member information would not have a material impact on our conclusions.

A number of checks have been performed on the member data, to ensure consistency between years and to ensure that contributor and pensioner information is consistent.

We have set out information about the membership and movement in membership over the three year period. The data has been obtained from a number of sources and it is possible that the tables below may not be totally consistent, with minor variations in numbers. These variations do not have an effect on the calculations that we have performed and are not material in this process.

B.2 CONTRIBUTOR RECORD DETAILS

The following records were obtained for contributing members:

- Identification
- Date of birth

- Date started service
- Date of joining the Scheme
- Salary
- Sex
- Exit code
- Contribution rate
- Accrued points
- Contribution account balance
- Amount of any Lump Sum payment
- Disability date

B.3 PENSIONER RECORD DETAILS

The following records were obtained for current pensioners:

- Identification
- Pension type
- Sex
- Dates of birth for member and spouse
- Date pension started and date spouse pension started
- Exit code and date of exit
- Details of children
- Commutation details
- Basic pension
- Supplementation pension

B.4 SUMMARY OF CONTRIBUTOR MOVEMENTS FOR THE THREE YEARS TO 30 JUNE 2011

	Males	Females	Total
2008 Contributors	1,596	237	1,833
Age Retirements	176	2	178
Invalidity / disability	33	3	36
Deaths	7	1	8
Resignations (with refund)	4	1	5
Resignations (preserved)	14	2	16
Total departures	**234**	**9**	**243**
2011 Contributors	**1,362**	**228**	**1,590**

B.5 SUMMARY OF CONTRIBUTOR DETAILS AS AT 30 JUNE 2011

	Males	Females	Total
Contributors			
Number	1,362	228	1,590
	$'000	$'000	$'000
Annual salaries	127,706	20,771	148,477
Contributions	5,764	905	6,669
Account balances	198,729	24,560	223,289
Preserved members			
Number	124	22	146
	$'000	$'000	$'000
Annual salaries	8,611	1,459	10,070

B.6 SUMMARY OF CONTRIBUTORS BY AGE GROUPS

Males

Ages	2008 No.	2008 Average Salary $	2011 No.	2011 Average Salary $
30 - 34	—	—	—	—
35 - 39	131	75,235	7	95,390
40 - 44	273	79,097	186	88,885
45 - 49	509	80,000	314	93,864
50 - 54	404	80,712	507	93,814
55 - 59	242	84,685	270	94,491
60 - 64	35	90,431	72	101,386
65 - 70	—	—	6	109,318
Totals	**1,595**	**80,577**	**1,362**	**93,763**

Females

Ages	2008 No.	2008 Average Salary $	2011 No.	2011 Average Salary $
30 - 34	—	—	—	—
35 - 39	57	72,924	3	86,566
40 - 44	101	76,419	78	88,177
45 - 49	58	78,229	99	91,717
50 - 54	14	85,893	34	91,846
55 - 59	7	87,328	10	100,038
60 - 64	—	—	4	107,671
65 - 70	—	—	—	—
Totals	**237**	**76,903**	**228**	**91,102**

B.7 SUMMARY OF PENSIONER DETAILS AS AT 30 JUNE 2011

Type of Pension	Current Act		Repealed Act		Total	
	Number	Annual Pension $'000	Number	Annual Pension $'000	Number	Annual Pension $'000
Age	644	25,049	140	4,712	784	29,761
Invalidity	84	3,141	125	4,420	209	7,561
Spouses	102	2,292	255	6,437	357	8,729
Children	27	204	—	—	27	204
Total	857	30,686	520	15,569	1,377	46,255

There were 2 females and 3 males receiving a disability pension as at 30/6/2011

B.8 DETAILS OF PENSIONER MOVEMENT FOR THE THREE YEARS TO 30 JUNE 2011

Type	2008 In Force	New Pensioners	Exits	2011 In Force
Age	667	183	66	784
Invalidity	206	39	31	214
Spouse	335	61	39	357
Child	32	9	14	27
Total	**1,240**	**292**	**150**	**1,382**

Note: Disability pensions are included with invalids.

B.9 DETAILS OF AVERAGE PENSION AMOUNTS AS AT 30 JUNE 2011

Males

Ages	2008 No.	2008 Average Pension $	2011 No.	2011 Average Pension $
35 - 39	1	33,702	—	—
40 - 44	4	32,562	1	36,594
45 - 49	7	38,835	9	34,690
50 - 54	20	31,274	15	46,117
55 - 59	96	33,679	113	38,518
60 - 64	205	36,341	242	43,008
65 - 69	116	32,888	181	39,179
70 - 74	148	29,225	114	33,672
75 - 79	129	27,372	136	30,398
80 - 84	72	31,841	94	31,914
85 - 89	40	38,070	45	39,631
90 - 94	7	47,227	13	46,432
95 - 99	—	—	1	37,230
100 - 104	—	—	—	—
Totals	**845**	**32,617**	**964**	**37,645**

Excludes child and temporary disability pensions.

Females

Ages	2008 No.	2008 Average Pension $	2011 No.	2011 Average Pension $
35 - 39	2	18,884	1	38,028
40 - 44	6	19,844	5	19,229
45 - 49	10	24,790	10	25,434
50 - 54	13	20,258	13	25,780
55 - 59	40	23,332	30	27,005
60 - 64	32	24,774	42	24,923
65 - 69	32	21,591	35	26,645
70 - 74	52	21,114	53	23,962
75 - 79	52	20,282	55	21,851
80 - 84	59	24,374	63	24,366
85 - 89	48	25,998	52	28,165
90 - 94	12	23,234	21	27,826
95 - 99	2	13,789	6	32,099
100 - 104	2	15,565	—	—
Totals	**362**	**22,821**	**386**	**25,289**

Excludes child and temporary disability pensions.

Appendix C

Contributor Experience

C.1 As at 1 July 2008, all New Scheme members were transferred to the Triple S Scheme. The numbers transferred were:

New Scheme members transferred to Triple S	Number
Active	362
Preserved	135
Total	497

The remainder of this section will only relate to Old Scheme members.

C.2 The Old Scheme was closed to new entrants on 31 May 1990.

C.3 The total years of exposure during the period were as follows:

	Males	Females
Years of exposure	4,408	701

Deaths

C.4 The mortality experience was as follows, with expected deaths determined according to the assumptions used in the previous investigation.

	Males	Females
Actual deaths	7	1
Expected deaths	8	1

The mortality rates have been retained at various percentages of the Australian life tables for each age. The Australian life tables used are Australian Life Tables 2005-07 adjusted for mortality improvement at the rates used in this review.

Invalidity Retirements

C.5 The invalidity experience was as shown below.

	Males	Females
Actual invalids	33	3
Expected invalids	25	3

The existing assumptions have been retained but with rates ceasing at age 60 and the proportion of invalidity retirements that are in respect of partial invalidity reducing from 40% to 20%.

Resignations

C.6 Resignations in the period 2008-11 were less than expected. A comparison of actual and expected resignations and the rates of resignation, for the three years ending 30 June 2011, are shown below.

	Males			**Females**		
Age	Actual	Expected	Rate	Actual	Expected	Rate
30 - 34	—	—	—	—	—	—
35 - 39	1	4	0.007	—	2	—
40 - 44	7	12	0.010	2	5	0.007
45 - 49	5	8	0.004	—	2	—
50 - 54	5	1	0.003	1	0	0.014
Total	**18**	**25**		**3**	**9**	

New assumptions have been adopted which are lower than the previous rates below age 50. Rates from age 50 to 54 have increased slightly reflecting some members' preference for a preserved pension which is payable on resignation instead of a lump sum benefit payable on retirement.

Preservation

C.7 A summary of the numbers preserving and as a percentage of those eligible to preserve is as follows:

Age	Males		Females		Total	
	Actual	Percentage	Actual	Percentage	Actual	Percentage
30 - 34	—	—	—	—	—	—
35 - 39	1	100%	—	—	1	100%
40 - 44	4	57%	1	50%	5	56%
45 - 49	4	80%	—	—	4	80%
50 - 54	5	100%	1	100%	6	100%
Total	**14**	**78%**	**2**	**67%**	**16**	**76%**

Actual preservations are slightly less than expected and the existing assumptions have been retained.

Age Retirements — Current Contributors

C.8 Actual and expected age retirements for the three years to June 2011 were as follows:

	Males	Females
Actual retirements	176	2
Expected retirements	227	8

Actual age retirements were significantly less than expected. This reflects less members taking a lump sum benefit from age 50 to 54, offset by an increase in resignations between these ages, and an increase in the number of members over age 60 postponing retirement. The rates have been reduced at most ages.

Age Retirements — Preserved Contributors

C.9 Actual and expected age retirements for the three years to June 2011 were as follows:

	Males	Females
Actual retirements	25	2
Expected retirements	37	2

Promotional Salary Increases

C.10 Promotional salary increases were 0.1% pa less than expected while total salary increases were 0.4% pa more than expected. The average annual increase in salaries over the three year period was 5.3%. This does not include the 3.5% increase on 1 July 2011. Existing assumed rates of salary promotion have been retained.

Commutation

C.11 Contributors can commute up to 100% of their pensions on age retirement or up to 10% on invalidity retirement. Invalid pensioners may also commute up to 50% of their pension on attaining age 55. New spouse pensioners may also commute up to 50%.

For the three years ended 30 June 2011 the commutation experience was as follows:

	Percentage of pensioners who commuted %	Percentage of pension commuted by those who commuted %	Average Percentage of pension commuted %
Age retirements:			
Males	57%	36%	21%
Females	—	—	—
Invalidity retirements:			
At start of pension	44%	16%	8%
At age 55	21%	33%	7%
Spouses	4%	37%	1%

Details of the average percentage of all new pensions commuted over each of the three years are:

	2008-09 %	2009-10 %	2010-11 %
Age Retirements	24%	20%	19%
Invalidity retirements:			
at start of pension	—	9%	8%
at age 55	1%	15%	10%
Spouses	—	2%	1%

We have decreased the commutation assumption in relation to age retirement pensions from 25% to 20% and invalidity pensions from 25% to 7.5%. The proportions for spouses have continued to decline and therefore we have reduced the commutation assumption from 5% to 0%.

Appendix D

Pensioner Experience

D.1 The mortality experience of pensioners during the three years to 30 June 2011 has been examined and compared with that assumed in the previous actuarial investigation.

Where appropriate the previous assumptions have been modified in light of this experience. Mortality rates have been expressed as a proportion of the underlying population mortality. For the purposes of this review we have taken the population mortality to be the Australian Life Tables 2005-07 updated by the rates of mortality improvement used in this review (referred to as adjusted ALT 2005-07).

Comments on individual aspects of the experience are detailed in the following sections of this Appendix and summaries of the rates adopted for the current investigation are set out in Appendix E.

Age Retirement Pensioners

D.2 The mortality experience was as follows, with expected deaths determined according to the assumptions used in the previous investigation.

	Males	Females
Actual deaths	46	2
Expected deaths	48	1

The proportions of the population mortality have been modified slightly to those used in the previous review and rise from 50% at ages below 65 to 100% from age 90.

Invalidity Pensioners

D.3 It is to be expected that invalidity pensioners will suffer higher rates of mortality than age retirement pensioners will, particularly in the first few years after retirement. The mortality experience of invalidity pensioners is summarised below:

	Males			Females		
	Year 1	Year 2	Later Years	Year 1	Year 2	LaterYears
Actual deaths	1	1	19	—	—	—
Expected deaths	2	*	17	*	*	*

** less than one expected death.*

For durations over two years, the mortality rates have been set to 120% of population mortality with minimum value of 0.01. These proportions have been retained.

For early durations the mortality rate has been set at 0.075 in year one and 0.04 in year two for both males and females.

Spouse Pensioners

D.4 The mortality experience of spouse pensioners was as follows:

	Males	Females
Actual deaths	—	38
Expected deaths	*	33

** less than one expected death.*

Spouse rates of mortality have been set to be the same as age pensioner rates.

Mortality Improvement

D.5 The mortality improvement factors have been set equal to the average of the 25 and 100 year factors in Appendix E of the Australian Life Tables 2005-07.

CPI Increases

D.6 Pensions are increased each 1 October and 1 April, according to the change in the Adelaide Consumer Price Index for the 6 months to the previous 30 June and 31 December respectively. Where the increase in CPI is negative, no adjustment to pensions is made and the pension increase for the following 6 months is based on the increase in CPI for the period since the last adjustment.

During the period, pensions were increased as follows:

Month of Increase	Current Act	Repealed Act
October 2008	2.76%	3.68%
April 2009	1.01%	1.35%
October 2009	0.59%	0.79%
April 2010	1.41%	1.88%
October 2010	1.33%	1.78%
April 2011	1.20%	1.60%

Proportion Married

D.7 The proportions of members who are married have been set after analysing the experience of pensioners, determining a proportion married at around age 60 based on that experience and calculating the proportions at higher ages based on the mortality assumptions. Assumed proportions at younger ages from the previous review have been retained.

D.8 The age difference assumption for the 2008 review was 3 for all males over age 30. An analysis of all female spouse pensioners has shown an increase in the age difference from about age 85. The assumed age difference for ages over 85 has therefore been increased to 4 years.

Appendix E

Demographic Assumptions

E.1 CONTRIBUTOR MORTALITY RATES

Age	Males	Females
30	0.00053	0.00021
35	0.00063	0.00029
40	0.00080	0.00044
45	0.00111	0.00067
50	0.00163	0.00102
55	0.00243	0.00148
60	0.00385	0.00237

E.2 CONTRIBUTOR INVALIDITY RETIREMENT RATES

Age	Males & Females
30	0.00121
35	0.00174
40	0.00251
45	0.00361
50	0.00519
55	0.00746
60	—

20% of the above rates are in respect of partial invalidity benefits.

E.3 CONTRIBUTOR RESIGNATION RATES

Age	Males & Females
20	0.01670
25	0.01840
30	0.01940
35	0.01640
40	0.01210
45	0.00780
50	0.00350

E.4 PRESERVATION PROPORTIONS

Age	Proportion
20	0.04
25	0.16
30	0.28
35	0.50
40	0.69
45	0.89
50	1.00
55	1.00
60	1.00

E.5 RATES OF RETIREMENT

Age	Current Contributors (2011)	Current Contributors (2008)	Preserved Contributors
50	0.04	0.07	—
51	0.02	0.02	—
52	0.01	0.02	—
53	0.01	0.01	—
54	0.01	0.01	—
55	0.09	0.09	0.85
56	0.06	0.09	0.93
57	0.06	0.09	0.97
58	0.15	0.18	1.00
59	0.20	0.25	1.00
60	0.45	0.50	1.00
61	0.25	-	1.00
62 – 69	0.25	-	1.00

In the 2008 review, all members over age 60 were assumed to retire immediately.

E.6 RATES OF PROMOTIONAL SALARY INCREASES

Age	Males & Females
20	0.043
25	0.036
30	0.029
35	0.023
40	0.018
45	0.013
50	0.009
55	0.006
60	0.003

E.7 FAMILY STATISTICS — MALES

Age	Percentage Married %	Age of Husband less Age of Wife	No. of Dependent Children	Average Age of Dependent Children
20	2	—	—	—
25	26	2	1	1
30	51	3	2	4
35	72	3	2	7
40	85	3	2	10
45	95	3	2	13
50	97	3	1	15
55	97	3	—	—
60	96	3	—	—
65	96	3	—	—
70	94	3	—	—
75	91	3	—	—
80	86	3	—	—
85	76	4	—	—
90	60	4	—	—

E.8 FAMILY STATISTICS — FEMALES

Age	Percentage Married	Age of Husband less Age of Wife	No. of Dependent Children	Average Age of Dependent Children
20	9	4	—	—
25	39	4	1	2
30	66	4	2	7
35	76	4	2	10
40	84	4	2	12
45	86	3	1	14
50	87	3	1	15
55	86	3	—	—
60	85	3	—	—
65	83	3	—	—
70	79	2	—	—
75	73	2	—	—
80	61	2	—	—
85	43	2	—	—
90	20	2	—	—

E.9 PENSIONER MORTALITY RATES

	Age Retirements		Invalidity Pensioners After 2 Years		Spouse Pensioners	
Age	Females	Males	Females	Males	Females	Males
20	-	-	0.01000	0.01000	0.00012	0.00033
25	-	-	0.01000	0.01000	0.00013	0.00038
30	-	-	0.01000	0.01000	0.00017	0.00044
35	-	-	0.01000	0.01000	0.00024	0.00052
40	-	-	0.01000	0.01000	0.00036	0.00067
45	-	-	0.01000	0.01000	0.00056	0.00092
50	-	-	0.01000	0.01000	0.00085	0.00136
55	0.00123	0.00202	0.01000	0.01000	0.00123	0.00202
60	0.00197	0.00321	0.01000	0.01000	0.00197	0.00321
65	0.00307	0.00536	0.01000	0.01290	0.00307	0.00536
70	0.00671	0.00941	0.01213	0.02070	0.00671	0.00941
75	0.01368	0.01851	0.02169	0.03612	0.01368	0.01851
80	0.02839	0.03780	0.04053	0.06397	0.02839	0.03780
85	0.06135	0.07804	0.07996	0.11223	0.06135	0.07804
90	0.12563	0.15648	0.15076	0.18777	0.12563	0.15648
95	0.20323	0.22434	0.24387	0.26921	0.20323	0.22434
100	0.27775	0.27664	0.33330	0.33196	0.27775	0.27664

The mortality rate in the first year of an invalidity pension is assumed to be 7.5% and 4% in the second year.

E.10 RATES OF MORTALITY IMPROVEMENT

The table shows the annual rates of decrease of mortality rates at each age.

Age	Females %	Males %
60	1.995	2.303
70	1.948	2.121
80	1.598	1.538
90	0.824	0.796
100	0.360	0.387

E.11 COMMUTATION

Pension Type	Percentage Commuted
Age	20.0
Invalid	7.5
Spouse	—