Mercer

Super SA

SA Police Superannuation Scheme Actuarial Report as at 30 June 2020

30 June 2021

Prepared by Mercer Consulting (Australia) Pty Ltd

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Contents

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Executive Summary

1.1.   We have prepared this report at the request of the Minister for Finance, 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:

- on the cost of the Police Superannuation Scheme (the Scheme) to the State Government (the Government) at the time of the report and in the foreseeable future, and
- estimating the proportion of future benefits under this Act that can be met from the Fund (that is, the value of accumulated member contributions).

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 Scheme which provides benefits for members of the police force in South Australia and their dependants.

1.3.   The previous report was prepared by Geoffrey Keen and Bruce Watson of Brett & Watson Pty Ltd as at 30 June 2017, with that report dated 27 June 2018.

1.4.   The Police Superannuation Board in its annual report for 2018-19 advised that the recommendations of the previous report were adopted. That is, the employer contribution rate of 22.0% of salaries was adopted and the share of benefits to be met from the Fund was increased from 22% to 24%.

1.5.   We have prepared this report with the assistance of actuarial staff within the Department of Treasury and Finance. We have been able to use computer analyses prepared by the actuarial staff, which derive their information from the administration system that is used by the Police Superannuation Board.

1.6.   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.

1.7.   The major conclusions of this report are that:

- the funding proportion for the Scheme of 24.0% can be retained; and
- the Government contribution rate of 22.0% of salaries for future service liabilities can be retained.

2

Legislation Affecting the Scheme

Governing Legislation

2.1.   The Police Superannuation Scheme is governed by the Police Superannuation Act, 1990 ("the Act") and the Police Superannuation Regulations ("the Regulations").

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.

2.3.   The Scheme is a constitutionally protected and exempt public sector superannuation scheme. No tax is payable by the Scheme. Benefits are paid to members as 'untaxed benefits'.

Amendments to Legislation

2.4.   Since the time of the previous report, there have been no amendments to the Act.

The Regulations have been amended to allow for the:

- application of the flexibility allowance retrospectively making the definition of salary include the entire flexibility allowance; and
- enhancement of benefits for police officers on secondment.

The amendments are not expected to have a material impact on the valuation results.

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 2020 was 5.2% for the Scheme. These member contributions are paid by the Treasurer into the Police Superannuation Fund (the Fund). The Fund is managed and invested by Superannuation Funds Management Corporation of South Australia ("**Funds SA**").

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 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 has produced a 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 Government. The assets of the Police Superannuation Scheme – Employer Contribution Account are shown in the table in paragraph 4.1 below.

3.6.   The Government contributions 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 2020, total Government contributions of $191,621,000 were made in respect of the past service liability for members of the Police Superannuation Scheme. These contributions are paid into the Employer Account for the Scheme and are not taken into account in setting the future contribution levels or funding proportions.

3.8.   This report considers the cost of newly accruing benefits but does not consider the level of contributions which should be made to the Employer Account in respect of past service liabilities. These contributions are reviewed annually as part of the Government's budget process.

Cost Sharing Proportion

3.9. 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.

3.10. For all resignations involving a return of the member's contribution account balance the prescribed proportion is 100% of the member's contribution account balance (with the balance of this benefit being fully met by the Government).

3.11. The prescribed proportion for other types of entitlement is currently 24.0%. This means that the Government is responsible for meeting the remaining 76.0% 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

3.12. Regulation 17, pursuant to Section 10(7)(b) of the Act, specifies that the proportion of administration costs that must be met by the Fund is 30%. The balance of the administration costs is met by the Government.

4

Assets of the Fund

Details of Assets

4.1.   At 30 June 2020, 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)	Asset %
Inflation Linked Investments	-	-	-	-
Property	97,113	235,575	332,688	17.1%
Equities – Australian	116,627	282,914	399,541	20.6%
Equities – International	175,346	425,353	600,699	30.9%
Fixed Interest	-	-	-	-
Diversified Strategies – Growth	89,735	217,680	307,415	15.9%
Diversified Strategies – Income	73,192	177,549	250,741	12.9%
Cash	14,913	36,176	51,089	2.6%
Total Investments	**566,926**	**1,375,247**	**1,942,173**	**100.0%**
Other Assets and Liabilities	(572)	(446)	(1,018)	
Net assets to pay defined benefits	**566,354**	**1,374,801**	**1,941,155**	

4.2.   At 30 June 2020 the net assets were $566.4 million for the Fund and $1,374.8 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.

Investment Returns & Crediting Rates

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.

4.6.   The assets of the Fund 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. A review of the defined benefit investment strategy is undertaken every three years, with a view to ensuring that strategy remains appropriate to achieving the Government's objectives.

4.7.   Rates of return on the assets for the Fund (money weighted), allowing for the management fees applied by Funds SA, for the last three years (based on changes in underlying unit prices) are shown below:

	2017/18	2018/19	2019/20	3 Year Ave.
Investment return	11.6%	8.0%	-1.2%	6.0%

4.8.   These rates of return were used to credit member contribution accounts in accordance with the Board's crediting rate policy. There are no reserves held in the Fund. A detailed review of the crediting rate policy is outside the scope of this actuarial review. Based on the main features, we consider the current policy to be suitable.

4.9.   Over the three years ending 30 June 2020, the average rate of return on the assets has been 6.0% per annum. This compares with the assumed return for the previous review of 7.0% per annum. Investment returns fell short of assumed returns by 1.0% per annum.

4.10.   As detailed in Appendix D the average rate of CPI increase over the three years to 30 June 2020 was 2.0% per annum. Thus, the average return of 6.0% per annum represents a return of 4.0% per annum above inflation, which is 0.5% per annum below the long term objective (and the assumption adopted for the most recent review).

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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 the prescribed proportion of all liabilities and expenses relating to present contributors, pensioners and preserved members, and comparing this with the present value of future member contributions together with the value of the Fund's investments.

5.3.   It should be appreciated that in the long run the Government's liability will depend on the actual experience of the Scheme, not on the assumptions made.

Economic Assumptions

5.4.   The level of benefits paid by the Scheme depends on future increases in salaries for contributory members, because benefits are directly related to members' salaries prior to ceasing employment and depend on future Consumer Price Index (CPI) increases for preserved benefits and pension payments. The ability of the Scheme to meet these benefit payments depends, in part, on the actual investment earnings achieved by the assets of the Fund in the future. Accordingly, suitable financial assumptions need to be determined for investment returns, salary inflation and price increases.

5.5.   The relationships between the assumptions adopted for these factors have a greater bearing on the cost estimates of the Scheme than do the individual assumptions. This is due to the effect of some assumptions being used to project the liability into the future (future pension and salary increases) and the other assumption being used to discount that liability to current day values (discount rate). Of prime significance during the in-service period is the differential between the future rate of investment earnings on the one hand, and the rate of salary growth due to inflation on the other. This differential is referred to as the real return over salary inflation. For preserved members and pensioners, the differential between the future rate of investment earnings and the future rate of price increases is important.

5.6.   It is more important to consider long-term expectations than the experience since the previous actuarial investigation when setting assumptions for the future since investment returns, salary increases, and price increases can vary significantly in the short term. The impact of recent experience is outlined in Section 6.10 below.

5.7. We note that a major investment objective of Funds SA is to achieve long term returns of 4.5% per annum more than price inflation for the assets supporting defined benefits (see paragraph 4.5 above). We have adopted this real rate of return for this investigation over the long term.

5.8. We have adopted an assumed rate of CPI inflation of 2% per annum. We have assumed future inflationary salary increases of 2.5% per annum. We note that the expectation in the short term is for general salary increases to be below the longer term rate. For all of the assumptions there will be periods where actual experience is either above or below the long term average assumed. We do not believe the short term expectations are outside the normal range of variation and so will not materially impact the results of the valuation.

5.9. In addition to an assumed level of inflationary salary increases, allowance is also made for promotional salary increases throughout a member's career.

5.10. The key economic long term assumptions adopted for this investigation are as follows (assumptions adopted at the previous review are shown in brackets for comparison):

	Assumptions (%)
Long term investment earnings	6.5 (7.0)
Long term inflationary salary increases*	2.5 (4.0)
CPI increases	2.0 (2.5)
Long term "real return" over inflationary salary increases	4.0 (3.0)
"Real return" over CPI	4.5 (4.5)

*Although allowance is also made for promotional salary increases (as described in Appendix C) the impact of these has reduced as the remaining active membership has aged.

Demographic Assumptions

5.11. 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 2020, as well as the experience for prior periods and mortality experience of the broader population.

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

5.13. The changes in assumptions compared with the previous valuation related to:

- rates of mortality;
- rates of invalidity;
- rates of age retirement; and
- rates of commutation.

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.

Rates of Mortality

5.14. 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 but updated the underlying population mortality to the most recent Australian Life Tables, being Australian Life Tables 2015-17 (ALT 2015-17).

We have made allowance for improvements in mortality to 30 June 2020, based on the 25 year mortality improvement factors in ALT 2015-17.

For this review we have adopted spouse mortality rates equal to 100% of the ALT 2015-17 (adjusted for mortality improvement). While lower rates of mortality amongst spouses have been experienced over the three year investigation period, experience over the past six years for spouse pensioners is broadly consistent with standard population mortality.

Rates of Invalidity

5.15. During the investigation period, higher rates of invalidity have been experienced for males. As a result, we have adjusted these rates in line with the experience observed. No changes have been made to female invalidity rates.

Rates of Retirement

5.16. During the investigation period, higher rates of age retirement have been experienced for ages 60 to 65. As a result, we have adjusted these rates in line with the experience observed.

Rates of Commutation

5.17. Allowance is made for pensioners and spouses to commute the pensions that they become entitled to. It was previously assumed that 12.5% of age retirements, 7.5% of invalidity retirements and no eligible spouses would commute their pensions to lump sums. As a result of experience over the last three years, the assumed commutation rate for age retirements has been decreased to 10.0%. The other assumed rates of commutation remain unchanged.

Proportions married

5.18. The proportions of members who are married at each age is determined based on the assumed proportion of members who are married at age 50, adjusted to reflect expected mortality after that age; and not allowing for divorce or remarriage after retirement. These rates have been updated to reflect the 2020 mortality assumptions.

Expenses

5.19. Future Fund administration expenses have been valued based on a cost of $250 per annum per member, increasing in line with general salary inflation.

Impact of Changes in Assumptions

5.20. 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 assumption changes on the valuation results in Section 6.10 below.

Method for Attributing Benefits to Past Membership

5.21. The calculation of the accrued liabilities has been carried out using a method of apportionment of benefits between past and future membership that satisfies the requirements of Professional Standard No. 402 "Determination of Accrued Benefits for Defined Benefit Superannuation Funds" issued by the Institute of Actuaries of Australia.

5.22. The past membership components of all benefits payable in future from the Scheme in respect of current membership are projected forward allowing for future salary increases, credited investment earnings and pension indexation, and are then discounted back to the review date at the assumed investment earning rate. The past membership component of each type of benefit is calculated by adjusting the total expected benefit in proportion to the period of membership at the reporting date divided by the period of membership at the projected date of ceasing employment.

Material Risks

5.23. One of the key objectives of this report is to determine the share of benefits that can be met from the Fund assets.

5.24. Two of the main risks affecting whether this share of benefits can be maintained over the future life of the Scheme are:

- Investment market performance over the long term: in particular if investment objectives in real terms are not met; and
- Trends in mortality improvement which significantly exceed assumptions.

5.25. These same risks will also affect the level of contributions which need to be paid into the Employer Account in order for the Government to meet its objective of full funding by 2034.

Insurance Arrangements

5.26.   Death and invalidity benefits payable from the Scheme are self-insured. Benefits are met from the assets of the Fund and the Employer Account as required. The methodology used to calculate the accrued liability includes an allowance for the uninsured component of death and invalidity benefits.

5.27.   We consider the existing self-insurance arrangements to be suitable given the nature of the Scheme. The exposure to death and invalidity benefits is small given the age profile of members and the form of benefit entitlements.

6

Valuation Results

Calculation of Funding Proportion

6.1.   To assess the financial position of the Scheme, we have projected the future benefit payments and expenses in respect of current contributors and pensioners, and then discounted these payments to the current date. The resulting values are the present value of projected liabilities for members of the Scheme, the prescribed proportion 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 proportions of 24.0% of benefits and 30% of administration expenses.

Present Value of Prescribed Proportion of Liabilities

Current Contributors	$'000	$'000
Age Retirements	217,921	
Invalidity Retirements	8,548	
Spouse and Children's Benefits	16,446	
Resignations with Cash Payments*	-	
Expenses	1,189	244,104
Current Pensioners		
Age Retirements	242,282	
Invalidity Retirements	32,518	
Spouses and Children	58,795	
Expenses	2,150	335,745
Total Liabilities		**579,849**

* Assumed to be zero.

Present Value of Assets

	$'000	$'000
Future Member Contributions	17,596	
Fund Investments as at 30 June 2020	566,354	
Total Assets		**583,950**
Surplus (Deficit)		**4,101**

6.3.   These results show that based on the current prescribed proportions (24.0% of benefits and 30% of expenses), the Fund is expected to eventually have surplus to its obligations. The present day value of this surplus of assets over liabilities is $4,101,000, or approximately 0.7% of total liabilities and expenses. This compares to a deficit of $3,357,000 (or 0.7% of total liabilities and expenses) at 30 June 2017 assuming the Fund share was 24.0% at that time

6.4.   We therefore recommend that the prescribed proportion of benefits be retained at 24.0%.

Projected Long Term Cost of the Scheme

6.5.   We have also considered the Government contributions required to meet the cost of supporting the benefits in respect of service after 30 June 2020. (Past service liabilities are being progressively funded by the Government, as discussed earlier in this Report).

6.6.   For this purpose, we have projected the future benefit payments and expenses 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 liabilities. The amount to be financed by Government contributions is the present value of future service liabilities less the amount of those liabilities which can be met from future member contributions.

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

Present Value of Future Service Liabilities

	$'000	$'000
Age Retirements	99,925	
Invalidity Retirements	2,598	
Spouse and Children's Benefits	6,762	
Resignations with Cash Payments	-	
Expenses	908	
Total Liabilities		**110,193**
Future Member Contributions		17,596
Liability to be Funded by Government Contributions		**92,597**
Required Government Contribution rate (% of salaries)		**21.5%**

6.8.   This means that, if an amount equivalent to 21.5% of contributors' salaries were set aside as a provision or invested each year, and experience was in line with assumptions, the projected future service benefits and expenses could be met from those future provisions or investments together with future member contributions. This is in line with the contribution rate of 21.7% determined at the 30 June 2017 actuarial investigations. Therefore we recommend that the current contribution rate of 22.0% of salaries be retained.

Explanation of Change in the Financial Position of the Fund

6.9.   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.

6.10.   The following table sets out the major influences affecting the change in the financial position between 30 June 2017 and 30 June 2020. The starting point of this analysis is the surplus of $43,295,000 at 30 June 2017 which was based on the previous funding proportion of 22.0%. The surplus of $4,101,000 arising in this valuation results in a net reduction in surplus of $39,194,000.

Influence	$million
Experience	
Change in fund proportion from 22.0% to 24.0%	(46.7)
Interest on surplus	(0.8)
Investment Returns	(14.9)
Salary and promotional increases	11.5
Lower pension increases	5.2
Commutation profit	(7.6)
Other	9.4
Total Experience	**(43.9)**
Change in Valuation Assumptions	
New age retirement rates	(2.0)
New pensioner mortality	(2.5)
New 25 year mortality improvement	(5.0)
New proportion married	2.2
Changes to commutation assumptions	(2.3)
Changes to economic assumptions*	14.5
Total Change in Valuation Assumptions	**4.9**
Net Change in Surplus	**(39.0)**

*The decrease in the salary increase assumption (from 4% per annum to 2.5% per annum) and the decrease in the CPI increase assumption (from 2.5% per annum to 2.0% per annum) had a positive impact on the surplus, partially offset by the decrease in the investment return assumption (from 7.0% per annum to 6.5% per annum).

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

6.11. It can be seen that the major reason for the reduction in surplus was the increase in the prescribed proportion from 22.0% to 24.0% following the 30 June 2017 actuarial review.

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 discount rates 0.5% higher and 0.5% lower than the assumed discount rate of 6.5%, and mortality decrements 10% higher and 10% lower than the assumed mortality rates. The results are shown in the following table.

	Surplus $'000	Government Contribution Rate	Fund Prescribed Proportion
Discount rate			
0.5% lower	-32,129	23.3%	22.7%
Valuation assumptions	4,100	21.5%	24.2%
0.5% higher	36,909	19.9%	25.6%
Mortality decrements			
10% lower	-3,909	21.7%	23.8%
Valuation assumptions	4,100	21.5%	24.2%
10% higher	11,478	21.3%	24.5%

Experience after the Valuation Date

6.14   No allowance has been made for any aspect of Scheme experience since 30 June 2020. This will be reflected in the next actuarial review, which is due to be undertaken as at 30 June 2023.

7

Projected Cost to the 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 Government continue to be responsible for meeting 76.0% of the cost of benefits for members of the Scheme.

7.2.   In the following table we have set out the projected costs of the Government share of benefits and expenses, as well as the total cost of benefits payable from the Scheme and expenses (ie including the Fund share of benefits and expenses).

Year ended 30 June	Nominal Projected Costs $m		Today's Dollar Projected Costs^ $m	
	Government Share	Total (including Fund share)	Government Share	Total (including Fund share)
2021	95.2	125.3	94.0	123.7
2022	102.0	134.3	98.3	129.4
2023	108.4	142.7	101.9	134.1
2024	114.1	150.2	104.7	137.8
2025	118.9	156.6	106.4	140.1
2026	123.6	162.7	107.9	142.0
2027	128.1	168.6	109.1	143.6
2028	132.0	173.7	109.7	144.3
2030	138.2	181.9	109.3	143.8
2035	143.6	189.0	100.4	132.1
2040	143.9	189.4	88.9	117.0
2045	136.6	179.8	74.6	98.2
2050	118.5	156.0	57.2	75.3
2055	89.2	117.4	38.0	50.1

^Today's dollar figures represent the nominal figures deflated to 2020 in line with assumed salary inflation of 2.5% per annum.

8
Conclusions

8.1.   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.

8.2.   The major conclusions of this report are that:

- the funding proportion of 24.0% be retained, and
- the Government contribution required to fund future service liabilities be retained at 22.0% of contributor salaries.

9

Actuary's Certification

Professional standards and scope

9.1.   This report satisfies the requirements of Professional Standard No. 400 of the Institute of Actuaries of Australia. Professional Standard No. 400 relates to the preparation of reports commenting on the financial condition of defined benefit superannuation funds. Where requirements of the Standard are not relevant or appropriate for the Scheme, we have omitted them.

Use of report

9.2.   This investigation report should not be relied upon for any other purpose or by any party other than the Government. Mercer is not responsible for the consequences of any other use. This report should be considered in its entirety and not distributed in parts.

9.3.   The advice contained in this report is given in the context of Australian law and practice. No allowance has been made for taxation, accountancy or other requirements in any other country.

Actuarial Uncertainty and Assumptions

9.4.   An actuarial investigation provides a snapshot of a scheme's financial condition at a particular point in time, and projections of a scheme's estimated future financial position based on certain assumptions. It does not provide certainty in relation to a scheme's future financial condition or its ability to pay benefits in the future.

9.5.   Future funding and actual costs relating to a scheme are primarily driven by the scheme's benefit design, the actual rate of salary inflation and any discretions exercised by the Government. The scheme's actuary does not directly control or influence any of these factors in the context of an actuarial investigation.

9.6.   A scheme's future financial position and the estimated long term cost depend on a number of factors, including the amount of benefits the scheme pays, the cause and timing of member withdrawals, scheme expenses, the level of taxation and the amount earned on any assets invested to pay the benefits. These amounts and others are uncertain and unknowable at the valuation date, but are predicted to fall within a reasonable range of possibilities.

9.7.   To prepare this report, assumptions, as described in Section 5 and Appendix E, are used to select a single scenario from the range of possibilities. The results of that single scenario are included in this report.

9.8.   However, the future is uncertain and a scheme's actual experience will differ from those assumptions; these differences may be significant or material. In addition, different assumptions or scenarios may also be within the reasonable range and results based on those assumptions would be different. For this reason this report also shows the impact on the results of certain changes in assumptions.

9.9.   Actuarial assumptions may also be changed from one valuation to the next because of mandated requirements, scheme experience, changes in expectations about the future and other factors. We did not perform, and thus do not present, an analysis of the potential range of future possibilities and scenarios.

9.10.   Because actual scheme experience will differ from the assumptions, decisions about benefit changes, investment policy, funding amounts, benefit security and/or benefit related issues should be made only after careful consideration of alternative future financial conditions and scenarios, and not solely on the basis of a set of results.

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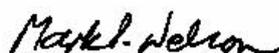
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Principal

30 June 2021

Appendix A
Benefits and Contributions

A.1 Overview

A.1.1 The Police Superannuation Scheme is closed to new members. The only members remaining in the Scheme are those who were accepted as contributors before 1 June 1990 (Pension Scheme or Old Scheme 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. Benefits previously payable under the Police Occupational Superannuation Scheme are now paid as an additional lump sum benefit under the Police Superannuation Scheme.

A.1.4. 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.1.5. 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.1.6. 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.

A.2. 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:

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

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 $2\frac{1}{3}$ 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 0 above

Commutation

A.2.12. On commencement of an invalidity pension, up to 20% of the pension may be commuted for a lump sum, with full commutation available at age 55. Full commutation is available for retirement pensions. On attainment of age 55 in the case 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 may commute their full pension entitlement. 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.

A.3. Police Occupational Superannuation Scheme – Additional Lump Sum Benefit

In addition to the above "Old Scheme" benefits, benefits previously payable under the Police Occupational Superannuation Scheme are now paid as an additional lump sum benefit under the Police Superannuation Scheme. This additional benefit is equivalent to 2.275% of final salary for each year of service.

A.4. Reductions to Benefits

The above benefits may be reduced where an amount has been paid (or is payable) in respect of Family Law, Superannuation Surcharge or Division 293 tax.

Appendix B
Membership Information

B.1. Background

We have used membership data extracted from the administration system used by the Police Superannuation Board for the ongoing administration of the Scheme.

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. Summary of Contributor Movements

	Males	Females	Total
2017 Contributors	**882**	**197**	**1,079**
Age Retirements	247	29	276
Invalidity / disability	22	3	25
Deaths	3	1	4
Resignations (with refund)	-	-	-
Resignations (preserved)	3	1	4
Total departures	**275**	**34**	**309**
2020 Contributors	**607**	**163**	**770**

B.3. Summary of Contributor Details As At 30 June 2020

	Males	Females	Total
Contributor			
Numbers	607	163	**770**
	$'000	**$'000**	**$'000**
Annual salaries	78,516	20,775	**99,291**
Contributions	3,233	994	**4,227**
Account balances	196,952	43,762	**240,714**
Preserved members			
Number	37	5	**42**
	$'000	**$'000**	**$'000**
Annual salaries	3,592	386	**3,978**

B.4. Summary of Contributors By Age Groups

Males

	2017		2020	
Age (Years)	No.	Average Salary ($)	No.	Average Salary ($)
<45	-	-	-	-
45 - 49	140	113,415	26	134,408
50 - 54	264	119,687	183	124,486
55 - 59	380	118,383	285	130,993
60 - 64	88	116,767	103	130,792
65 - 69	10	131,274	8	142,604
70 - 74	1	131,818	2	147,558
Totals	**883**	**117,985**	**607**	**129,351**

Females

Age (Years)	2017		2020	
	No.	Average Salary ($)	No.	Average Salary ($)
< 45	-	-	-	-
45 - 49	63	113,122	14	123,244
50 - 54	93	117,776	87	125,056
55 - 59	37	114,275	57	132,334
60 - 64	4	150,908	4	121,275
65 - 69	37	114,275	1	141,890
Totals	**234**	**115,982**	**163**	**127,456**

B.5. Summary of Pensioner Details As At 30 June 2020

Type of Pension	Current Act		Repealed Act		Total	
	No.	Annual Pension $'000	No.	Annual Pension $'000	No.	Annual Pension $'000
Age	1,335	76,390	40	1,645	1,375	78,035
Invalidity	152	8,030	72	3,210	224	11,240
Spouses	196	5,383	200	6,153	396	11,536
Children	23	184	-	-	23	184
Total	**1,706**	**89,987**	**312**	**11,008**	**2,018**	**100,995**

There were 4 males receiving a disability pension as at 30 June 2020.

B.6. Details of Pensioner Movements

Type	2017 in Force	New pensioners	Exits	2020 In Force
Age	1,150	300	75	1,375
Invalidity	220	26	22	224
Spouses	372	73	49	396
Children	28	4	9	23
Total	**1,770**	**403**	**155**	**2,018**

Note: Disability pensions are included with invalidity pensioners.

B.7. Details of Average Pension Amounts As At 30 June 2020

Males

Age (Years)	2017		2020	
	No.	Average Pension ($)	No.	Average Pension ($)
40 - 44	1	33,589	-	-
45 - 49	8	59,021	3	63,006
50 - 54	13	50,539	15	60,884
55 - 59	149	45,885	121	52,304
60 - 64	341	55,160	418	63,067
65 - 69	308	54,932	380	61,501
70 - 74	203	46,339	245	54,171
75 - 79	103	40,514	138	46,182
80 - 84	105	35,484	92	41,916
85 - 89	62	36,563	70	36,445
90 - 94	25	44,853	19	45,891
95 - 99	4	52,978	5	51,886
100 - 104	25	44,853	1	46,567
Totals	**1,347**	**48,816**	**1,507**	**56,001**

Excludes child and temporary disability pensions.

Females

Age (Years)	2017		2020	
	No.	Average Pension ($)	No.	Average Pension ($)
35 - 39	7	33,156	1	62,831
40 - 44	-	-	-	-
45 - 49	7	33,156	3	31,936
50 - 54	17	30,066	14	37,858
55 - 59	31	34,162	50	42,775
60 - 64	41	33,874	54	41,270
65 - 69	52	34,654	53	36,631
70 - 74	42	26,841	59	35,639
75 - 79	65	27,391	61	28,214
80 - 84	62	25,207	77	27,334
85 - 89	55	29,232	59	28,324
90 - 94	40	32,523	40	30,739
95 - 99	8	29,557	16	35,110
100 - 104	40	32,523	1	28,017
Totals	**467**	**30,282**	**488**	**33,640**

Excludes child and temporary disability pensions.

Appendix C
Contributor Experience

C.1.   The experience of contributors during the three years to 30 June 2020 has been examined and compared with that assumed at the previous actuarial investigation.

C.2.   The total years of exposure during the period were as follows:

	Males	Females
Years of exposure	2,155	537

Deaths

C.3.   The mortality experience was as follows, with expected deaths determined according to the assumptions used in the previous investigation.

	Males	Females
Actual deaths	3	1
Expected deaths	5	1

The mortality rates have been retained at 60% of the Australian life tables for each age. The Australian life tables used have been updated to Australian Life Tables 2015-17 adjusted for mortality improvement at the rates used in this review.

Invalidity Retirements

C.4.   The invalidity experience was as shown below.

	Males	Females
Actual invalids	22	3
Expected invalids	14	3

The invalidity assumptions for males have been increased in line with the observed experience. The existing assumptions for females have been retained.

Resignations

C.5. A comparison of actual and expected resignations and the rates of resignation, for the three years ending 30 June 2020, are shown below.

Age	Males			Females		
	Actual	Expected	Rate	Actual	Expected	Rate
<45	-	-	-	-	-	-
45 - 49	-	1	-	-	0	-
50 - 54	3	2	0.004	1	1	0.004
Total	3	3		1	1	

The resignation rate equal to 0.003 for all ages adopted at the previous investigation has been retained.

Preservation

C.6. A summary of the number of members preserving their benefit, and as a percentage of those eligible to preserve, is as follows:

Age	Males		Females		Total	
	Actual	Percentage	Actual	Percentage	Actual	Percentage
< 50	-	-	-	-	-	-
50 - 54	3	100%	1	100%	4	100%
Total	3	100%	1	100%	4	100%

The existing assumptions have been retained.

Age Retirements — Current Contributors

C.7.   Actual and expected age retirements for the three years to June 2020 were as follows:

	Males	Females
Actual retirements	246	29
Expected retirements	228	18

Actual age retirements were higher than expected for most ages. The rates have been adjusted to reflect those changes.

Age Retirements — Preserved Contributors

C.8.   Actual and expected age retirements for the three years to June 2020 were as follows:

	Males	Females
Actual retirements	21	11
Expected retirements	20	10

The rates of preserved age retirement of 95% at age 55 and reducing between age 56 and 59 have been retained. All preserved members are assumed to retire at ages over 60.

Promotional Salary Increases

C.9.   Promotional salary increases were 0.2% p.a. less than expected while total salary increases were 1.7% p.a. less than expected. The average annual increase in salaries over the three year period was 2.9% pa. Existing assumed rates of salary promotion have been retained.

Commutation

C.10.   Contributors can commute up to 100% of their pensions on age retirement. Contributors can commute up to 20% on invalidity retirement before age 55. Invalid pensioners may commute up to 100% of their pension on retirement after age 55 or on attaining age 55. New spouse pensioners may also commute up to 100%.

For the three years ended 30 June 2020 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	45%	19%	9%
Females	43%	28%	12%
Invalidity retirements:			
At start of pension	40%	12%	6%
At age 55	43%	22%	10%
Spouses	4%	45%	2%

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

	2017-18 (%)	2018-19 (%)	2019-20 (%)
Age retirements	10%	9%	10%
Invalidity retirements			
At start of pension	20%	-	5%
At age 55	11%	12%	5%
Spouses	-	6%	-

We have decreased the commutation assumption in relation to age retirement pensions from 12.5% to 10.0%. The proportions for invalid and spouse pensioners have been retained at 7.5% and nil respectively.

Appendix D: Pensioner Experience

D.1.   The mortality experience of pensioners during the three years to 30 June 2020 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 2015-17 updated by the rates of mortality improvement used in this review (referred to as adjusted ALT 2015-17).

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	76	-
Expected deaths	73	2

The proportions of the population mortality are 60% at ages below 65 and 100% from age 90. These proportions are the same as the 2017 review and increase smoothly between ages 65 and 90 to reflect the experience.

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	Later Years
Actual deaths	-	1	21	-	-	0
Expected deaths	2	1	20	*	*	1

Less than one expected death.

The mortality rates for females have been retained while those for males have been appropriately adjusted to reflect experience.

Spouse Pensioners

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

	Males	Females
Actual deaths	-	52
Expected deaths	*	59

* Less than one expected death.

Spouse pensioner mortality was previously assumed to be the same as age pensioner mortality (ie a proportion of the Australian Life Tables). Although actual deaths were lower than expected, experience over the six year period ending 30 June 2020 was slightly above expected, and broadly in line with population mortality. Accordingly spouse pensioner mortality has been assumed to be in line with ALT 2015-17 (adjusted for mortality improvements). In practice this change has very little impact as the vast majority of deaths are expected to occur after age 90, at which point the two sets of assumptions converge.

Mortality Improvement

D.5.   The mortality improvement factors have been set equal to the 25 year factors in Australian Life Tables 2015-17.

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 2017	0.46%	0.61%
April 2018	1.83%	2.44%
October 2018	0.81%	1.08%
April 2019	0.80%	1.07%
October 2019	0.62%	0.83%
April 2020	1.50%	2.00%
Average increase	**2.01% per annum**	**2.69% per annum**

Proportion married

D.7.   The proportion married at each age is derived from the assumed proportion married at age 50, adjusted to reflect assumed mortality after age 50. The experience of proportions married was lower than expected across most ages. However, we have retained the proportion of 94% for males at age 50 and 81% for females at age 50. Therefore the change in the proportions married adopted in this investigation relate to the updates to the mortality assumptions as mentioned in section D.1 above.

Married age differences

D.8.   Experience of age differences was not significantly different to those previously assumed and therefore the assumed age differences from the previous review have been retained.

Appendix E
Demographic Assumptions

E.1. Contributor Mortality Rates

Age	Males	Females
40	0.00080	0.00045
45	0.00116	0.00068
50	0.00162	0.00100
55	0.00237	0.00144
60	0.00353	0.00206

E.2. Contributor Invalidity Retirement Rates

Age	Males	Females
40	0.00307	0.00251
45	0.00481	0.00361
50	0.00752	0.00519
55	0.01178	0.00746
60	-	-

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

E.3. Contributor Resignation Rates

Age	Males & Females
40	0.00300
45	0.00300
50	0.00300

E.4. Preservation Proportions

Age	Proportion
40	0.69
45	0.89
50	1.00

E.5. Rates of Retirement

Age	Current Contributors (2020)	Current Contributors (2017)	Preserved Contributors
50	0.001	0.001	-
51	0.001	0.001	-
52	0.001	0.001	-
53	0.001	0.001	-
54	0.001	0.001	-
55	0.060	0.060	0.950
56	0.060	0.060	0.900
57	0.070	0.070	0.900
58	0.090	0.090	0.900
59	0.120	0.120	0.900
60	0.500	0.450	1.000
61	0.350	0.300	1.000
62	0.350	0.300	1.000
63	0.350	0.300	1.000
64	0.350	0.250	1.000
65	0.350	0.250	1.000
66 – 69	0.250	0.250	1.000

E.6. Rates of Promotional Salary Increases

Age	Males & Females
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 dependant children
40	81	3	2	10
45	90	3	2	13
50	94	3	1	15
55	94	3	-	-
60	92	3	-	-
65	91	3	-	-
70	89	3	-	-
75	85	3	-	-
80	80	3	-	-
85	70	4	-	-
90	55	4	-	-

E.8. Family Statistics — Females

Age	Percentage Married (%)	Age of Husband less age of Wife	No. of dependent children	Average age of dependant children
40	77	4	2	12
45	80	3	1	14
50	81	3	1	15
55	79	3	-	-
60	77	3	-	-
65	73	3	-	-
70	69	2	-	-
75	62	2	-	-
80	51	2	-	-
85	35	2	-	-
90	17	2	-	-

E.9. Pensioner Mortality Rates

Age	Age Retirements		Invalidity Pensioners after 2 years		Spouse Pensioners	
	Females	Males	Females	Males	Females	Males
40	-	-	0.01500	0.01500	0.00074	0.00134
45	-	-	0.01500	0.01500	0.00113	0.00194
50	-	-	0.01500	0.01500	0.00167	0.00269
55	0.00145	0.00237	0.01500	0.01500	0.00241	0.00395
60	0.00206	0.00353	0.01500	0.01500	0.00343	0.00588
65	0.00308	0.00514	0.01500	0.01500	0.00513	0.00857
70	0.00565	0.00893	0.01500	0.01644	0.00867	0.01370
75	0.01090	0.01680	0.01830	0.02822	0.01525	0.02352
80	0.02304	0.03378	0.03493	0.05122	0.02911	0.04268
85	0.05244	0.07200	0.07108	0.09760	0.05923	0.08133
90	0.11821	0.14660	0.14185	0.17592	0.11821	0.14660
95	0.20149	0.21960	0.24179	0.26352	0.20149	0.21960
100	0.30832	0.30175	0.36998	0.36210	0.30832	0.30175

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

Age	Females (%)	Males (%)
60	2.163	2.553
70	2.396	2.986
80	2.029	2.350
90	0.801	0.889
100	-	0.081

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

E.11. Commutation

Pension Type	Percentage Commuted
Age	10.0
Invalid	7.5
Spouse	-