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CONSULTING ACTUARIES

SOUTH AUSTRALIAN  
SUPERANNUATION SCHEME

ACTUARIAL REPORT  
AS AT  
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Prepared by: Geoff Keen FIAA

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**Deborah Jones FIAA - Geoff Keen FIAA - Bruce Watson FIAA**

Ground Floor, 157 Grenfell Street, Adelaide SA 5000

**Telephone:** (08) 8232 1333

**Email:** [contact@brettandwatson.com.au](mailto:contact@brettandwatson.com.au)

**Website:** [www.brettandwatson.com.au](http://www.brettandwatson.com.au)

## Executive Summary

### Terms of Reference

- ES1 We have prepared this report at the request of the South Australian Department of Treasury and Finance, to satisfy the requirements of Section 21 of the Superannuation Act, 1988. This Section of the Act requires an Actuary to provide a report to the Minister —
- on the cost of the Scheme to the State Government at the time of the report and in the foreseeable future; and
  - estimating the proportion of future benefits under Part 5 that can be met from the Fund.

### Assumptions

- ES2 In setting the economic assumptions for the valuation we have considered the very long term historical investment returns, the investment objectives of Funds SA and the current economic environment. The assumptions adopted are summarised below along with the long-term assumptions adopted at the previous review:

	This review	Previous review
Long Term Investment Earnings:	6.5% p.a.	7.0% p.a.
Investment Earnings in 2019-20	Negative 4.0% p.a.	
Long Term Inflationary Salary Increases:	2.5% p.a.	4.0% p.a.
CPI Increases:	2.0% p.a.	2.5% p.a.
Long term “Real Return” over inflationary salary increases	4.0% p.a.	3.0% p.a.
“Real Return” over CPI	4.5% p.a.	4.5% p.a.

- ES3 As Pensions linked to CPI represent most of the liability, the most important economic assumption above is the long-term Real Return over CPI. This has remained unchanged since the previous review, albeit with both CPI and investment returns at lower levels than previously.
- ES4 We also reviewed the demographic assumptions of the Scheme. The most significant changes in assumptions were:
- higher rates of spouse pensioner mortality, closer to population mortality than previously, reflecting the long-term experience of the Scheme;
  - lower rates of mortality improvement partly arising from the adoption of an average of the 25-year and 125-year mortality improvement rates instead of the 25-year rates; and
  - lower proportions of contributor pensioners with a spouse or putative spouse, reflecting the long-term experience of the Scheme.

## ES2

**Results**

- ES5 The employer contribution rate as a percentage of salary to cover Lump Sum Scheme future service benefits on our best estimate assumptions and with changes in assumptions is:

<b>Future Contribution Rate for Lump Sum Scheme</b>	
Change in assumption	Employer Contribution Rate
Base	13.3%
Discount rate reduced by 1%	13.8%
Discount rate increased by 1%	12.8%
Salary inflation reduced by 1%	12.8%
Salary inflation increased by 1%	13.8%

We recommend that the current employer contribution rate of 14.75% of contributors' salaries be maintained. Given that the declining membership and fluctuating economic assumptions could lead the calculated contribution rate to show fluctuation in future reviews, a change in contribution rate is not warranted.

- ES6 For the Pension Scheme, the maximum possible Fund share of benefits and the employer contribution rate to cover future service benefits on our best estimate assumptions and with changes in assumptions is:

**Maximum Fund Share and Future Contribution Rate for Pension Scheme**

Assumption	Fund Share (Excluding surplus)	Employer Contribution Rate
Base	18.8%	23.9%
Discount rate reduced by 1%	17.2%	27.5%
Discount rate increased by 1%	20.4%	20.9%
CPI Inflation rate reduced by 1%	20.4%	21.4%
CPI Inflation rate increased by 1%	17.1%	26.9%
Mortality rate reduced by 10%	18.4%	23.6%
Mortality rate increased by 10%	19.2%	24.3%

- ES7 Given the current volatility in the investment markets which appears to be heightened due to the impact of the COVID-19 pandemic it would be reasonable to maintain a reserve in the order of 20% which means the Prescribed Portion can be increased to 15% and employer share reduced to 85%.
- ES8 As the employer contribution rate only applies to 303 remaining members, the contribution reduction is relatively small and the rate is highly variable depending on economic assumptions, it would be reasonable to maintain an employer contribution rate of 26.0% of contributors' salaries.

## ES3

**Risks**

- ES9 The major risks that would adversely impact the future service cost and Fund Share of the Schemes are:
- a. reduced investment returns;
  - b. an increase in CPI inflation (Pension Scheme) or Salary Inflation (Lump Sum Scheme);
  - c. a significant drop in mortality (Pension Scheme); or
  - d. a significant increase in rates of marriage or reduction in age of spouse (Pension Scheme).

**Lump Sum Scheme Member Contribution Accounts**

- ES10 It is my understanding that:
- a. there is currently a deficit of \$3.2m, or 0.5% of member accounts to Assets held for these accounts;
  - b. the asset allocation of the Scheme approximately matches the asset allocation Members have chosen for their contribution accounts; and
  - c. earnings are allocated to Members via changes in the unit price of the selected investment option.
- ES11 This shortfall will increase or decrease where there is a difference in return between the asset allocations selected and the actual assets of the Scheme. If the Scheme assets remain in the same allocation as Members' Accounts, then this difference will remain unless action is taken to address the matter. If the investment returns of the Scheme assets are below those of Member Accounts, then this deficit will increase.

**Impact of COVID-19 Pandemic**

- ES12 The likely main financial impact of the COVID-19 pandemic on the Schemes is if future investment returns were to be significantly reduced. We have reduced the assumed salary inflation rate to allow for the likely impact of the COVID-19 pandemic and have reduced the assumed investment return both in the long term and for the year ending 30 June 2020. While the assumed CPI inflation rate has been reduced, the assumed investment return has also been reduced by the same amount, offsetting the impact of the reduced CPI inflation rate. Increased mortality rates reduce the cost of the Pension Scheme and we consider are very unlikely to significantly impact the Lump Sum Scheme.
- ES13 We note that all current contributors are permanent employees and we are not aware of any having been stood down due to the COVID-19 Pandemic. The Act does not permit the release of their defined benefits on hardship and compassionate grounds including COVID-19. However, they can take money from their rollover accounts under these circumstances. I note that allowance is currently made to reduce benefits in respect of Family Law benefits, Superannuation Surcharge and Division 293 Tax payments.

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# 1 Introduction

- 1.1 We have prepared this report at the request of the South Australian Department of Treasury and Finance, to satisfy the requirements of Section 21 of the Superannuation Act, 1988. This Section of the Act requires an Actuary to provide a report to the Minister —
  - a. on the cost of the 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 Part 5 that can be met from the Fund.
- 1.2 This report continues the series of reports which have been prepared to address these issues in the past. These reports have been prepared at three yearly intervals, and in addition to the requirements of Section 21 of the Act have provided information about the funding and cost of the superannuation scheme which is used for employees in the public sector in South Australia.
- 1.3 The previous actuarial valuation was prepared as at 30 June 2016 by Catherine Nance of PricewaterhouseCoopers and dated June 2017.
- 1.4 We have prepared this report with the assistance of the 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 computer system which is used within the State Superannuation Office (Super SA) in the Department of Treasury and Finance.
- 1.5 The purpose of this report, is to —
  - a. examine the economic and demographic experience of the Scheme;
  - b. provide information about the funding status of the Scheme;
  - c. recommend any changes to the Prescribed Proportion of Pension Division benefits met by the Pension Division assets;
  - d. recommend contribution rates to apply for both the Lump Sum and Pension Divisions in respect of future service benefits; and
  - e. produce estimates of the emerging cost of the Scheme.
- 1.6 This Report excludes the liabilities and assets relating to TransAdelaide, which relate to members of the Scheme under the provisions of the Superannuation (STA Employees) Regulations 2005. These liabilities and assets should be reviewed separately.
- 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 South Australian Superannuation Scheme (SASS) is governed by the Superannuation Act 1988. The Scheme is closed to new entrants.
- 2.2 Under the Act, members who joined the Scheme before 31 May 1986, can receive benefits in pension form, while those members who joined on or after that date but before 4 May 1994, receive benefits in lump sum form.
- 2.3 Pension members receive benefits under the Pension Division of the Act, while lump sum members receive benefits under the Lump Sum Division of the Act. An overview of the benefits and contributions under the current legislation is provided in Appendix A.
- 2.4 The government's current share of the cost of the SASS benefits are:
  - a. 86% of benefits paid to pension scheme members (excluding retrenchment pensioners);
  - b. 100% of benefits paid to retrenchment pensioners until age 60; and
  - c. 100% of the employer component of lump sum scheme benefit payments.

For Pension Scheme members, the cost of the remaining 14% of their benefits (the Prescribed Proportion) is provided from the assets of the Fund which comprise member's own contributions accumulated with interest. This Prescribed Proportion will vary over time in line with the change in the financial position of the Scheme.

- 2.5 As the Scheme is a constitutionally protected scheme, no tax is payable by the Scheme and members' benefits are paid as untaxed benefits.

### Amendments to Legislation

- 2.6 Since the time of the previous report, there have been two amendments to the Act. The first amended the definition of putative spouse to provide for registered relationships under the Relationship Register Act 2016. The second related to the jurisdiction and procedures of the South Australian Civil and Administrative Tribunal.
- 2.7 The amendments should have negligible impact on the valuation.

## 3 Funding of the Scheme

### Member Contributions

- 3.1 Members make contributions to the Scheme at varying rates, according to their desired benefit levels. An amount equal to these contributions is paid by the Treasurer into the South Australian Superannuation Fund (the "Fund"). This Fund is managed and invested by Funds SA.
- 3.2 The Fund retains separate divisions for the Pension and Lump Sum Scheme contributors. The amount of assets in the two divisions should generally correspond with the total of individual contribution accounts maintained for the members of the respective Schemes.
- 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 which 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 will be maintained in distinct accounts for each of the State schemes. In particular the assets for the SASS scheme are held in the SASS Employer Contribution Account.
- 3.6 The payments which are being made into the investment pool (by both the State Government and the employing agencies) 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. During the twenty-five years ending 30 June 2019, payments made in respect of the unfunded past service liability for all the public sector schemes totalled around \$8.0 billion.
- 3.7 The scope of this report does not include assessing the funding program for the Scheme's Past Service Liability.

### Balance of Costs for this Scheme

- 3.8 The employer share of benefit costs is initially totally met by the Treasurer, in respect of both the Pension Scheme and Lump Sum Scheme. The Treasurer is generally reimbursed for a portion of the benefit cost from employer accounts (established to meet employer liabilities) managed by Funds SA. Separate employer accounts are maintained with Funds SA for all Authorities which are liable for the superannuation costs for their employees. Contributions by employing agencies in respect of both Pension Scheme and Lump Sum Scheme members are paid into this Employer Contribution Account.

The only benefits which are now reimbursed from other sources are those in respect of former employees of the Universities, where the employer costs are shared with the Commonwealth Government.

- 3.9 Under the current "cost sharing" arrangements, the Pension division of the Fund meets a Prescribed Proportion of benefit payment costs, currently 14%, except:



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- (a) benefits involving a return of members' contributions, where the Fund meets 100% of the payment, and the employer meets 100% of the Superannuation Guarantee, and
- (b) the cost of retrenchment pension paid between the time of the retrenchment and age 60 is totally met by the employing department or agency.

As a result, the employing department or agency is generally required to meet 86% of benefit payments. This cost sharing arrangement has been in place without significant amendment since 1 July 1988. The last change was a decrease in the Prescribed Proportion from 20.4% to 14% with effect from January 2011, following the 2010 actuarial review.

- 3.10 For the Lump Sum Scheme, the member financed benefit is met from the Lump Sum division of the Fund. The employer component of benefits is financed from the SASS Employer Contribution Account maintained by Funds SA.

## 4 Assets of the Fund

### Details of Assets

- 4.1 At 30 June 2019, the assets of the Fund which were invested by Funds SA for the two divisions were comprised as follows (by market value):

Asset Type	Pension Scheme Division (old scheme) (\$'000)	Lump Sum Scheme Division (new scheme) (\$'000)	Total (\$'000)
Australian Equities	363,879	130,027	493,906
International Equities	466,372	167,189	633,562
Property	276,840	79,103	355,943
Diversified Strategies Growth	268,433	60,043	328,476
Diversified Strategies Income	216,578	96,394	312,972
Inflation Linked Securities	—	37,925	37,925
Fixed Interest	—	26,422	26,422
Short Term Fixed Interest	—	9,751	9,751
Cash	23,898	18,667	42,565
Socially responsible investment	—	1,788	1,788
<b>Total Assets</b>	<b>1,616,001</b>	<b>627,309</b>	<b>2,243,310</b>
Plus adjustment to Scheme accounts	5,131	-15,788	-10,657
<b>Net Assets</b>	<b>1,621,132*</b>	<b>611,521</b>	<b>2,232,653</b>

*\*The Pension Scheme Division assets are higher than those shown in the financial statements as at 30 June 2019 as these assets were understated by \$18.6 million.*

The adjustment to Scheme accounts shown in this table comprises such items as cash and deposits with the Department of Treasury and Finance, contributions receivable and benefits payable.

- 4.2 The Funds SA investment product which covers the South Australian Superannuation Scheme is the Defined Benefit portfolio (see paragraph 4.3 below).

As at 30 June 2019, the actual asset allocation and target allocation for the Defined Benefit Portfolio is set out below:

	Actual (%)	Target (%)
(a) Australian Equities	23	20
(b) International Equities	29	30
(c) Property	17	18
(d) Diversified Strategies Growth	17	16
(e) Diversified Strategies Income	13	14
(f) Inflation Linked Securities	—	—
(g) Fixed Interest	—	—
(h) Short Term Fixed Interest	—	—
(i) Cash	1	2
(j) Socially responsible investment	—	—

The allocation to growth assets (shares and property) at 30 June 2019 was 86%.

Member investment choice for the Lump Sum Scheme Division commenced as from 5 August 2004 in respect of member contributions. The default allocation for this Division remains the Growth Portfolio.

#### Returns on Investments

- 4.3 From 1 January 2017, a, customised Defined Benefit investment portfolio was established in addition to the then existing portfolios. The objective of this portfolio is a long-term return of CPI + 4.5% which is the same as High Growth portfolio but includes a higher allocation to unlisted assets rather than increasing the exposure to listed equities.
- 4.4 The assets of the Pension and Lump Sum divisions 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 from year to year, as Australian and international economies fluctuate over time.
- 4.5 Rates of return on the assets held in the Pension and Lump Sum divisions, allowing for the management fees applied by Funds SA, for the last three years (based on changes in underlying unit prices) have been —

2016/17	2017/18	2018/19
12.5%	11.7%	8.2%

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4.6 For the 3 year intervaluation period, the actual investment return compared to the expected assumptions used in the 2016 valuation are as below:

	Salary increases	Pension increases	Investment return	Real return actives	Real return pensioners
Actual Increase (p.a.)	2.6%	1.7%	10.6%	8.0%	8.9%
Expected increase (p.a.)	4.2%	2.5%	7.0%	2.8%	4.5%
Difference (p.a.)	(1.6)%	(0.8)%	3.6%	5.2%	4.4%

4.7 As such the actual real returns exceeded the expected real returns by 5.2% per annum over salary inflation and by 4.4% per annum over CPI.

## 5 Valuation Assumptions

### Introduction

- 5.1 This actuarial valuation applies a model to project the expected amount of each item of income and expenditure in each future year. These expected cash flows are then discounted to the valuation date to determine the present values of these amounts. These calculations require assumptions to be made regarding:
- a. economic assumptions relating to the future rates of investment earnings, inflationary salary increases and CPI inflation;
  - b. demographic assumptions relating to the future rates of retirement, death, invalidity and resignation, and including the proportion of pension commuted and promotional salary increases; and
  - c. valuation of the assets which is, as far as possible, consistent with the valuation of the Scheme's liabilities.
- 5.2 Once the present value of the Scheme's liabilities and assets has been calculated, the contribution rate for each Division is then determined by allocating the cost over future years in accordance with an appropriate funding method.
- 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 their retirement, death, etc. and depends on future 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 Scheme in the future. Accordingly, suitable financial assumptions need to be determined for investment returns, salary inflation and price increases.
- 5.5 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. Accordingly, these elements of the actuarial assumptions were chosen to not only reflect long-term trends but also to ensure that their combined effects would be mutually consistent. Therefore, 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 The financial elements of the experience were examined in Section 4. However, as investment returns, salary increases, and price increases can vary significantly in the short term it is more important to consider long-term expectations than the experience since the previous actuarial investigation, when setting assumptions for the future.

- 5.7 We note that a major investment objective by Funds SA is to achieve long term returns of 4.5% per annum more than price inflation for the Defined Benefit investment product (see paragraph 4.3 above). I have adopted this real rate of return for this investigation over the long term. Based on investment returns to the date this assumption was set, we have assumed rate of return of negative 4% per annum for the year ending 30 June 2020.
- 5.8 We have adopted an assumed rate of CPI inflation of 2% per annum.
- 5.9 We have assumed inflationary salary increases of 2.5% per annum over average future scheme membership. No allowance for known short term salary increases for some groups has been made.
- 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. New rates of promotional salary increases have been adopted with rates reduced by about 0.2% for Teachers and Others from the previous review.
- 5.11 Set out below is a summary of the economic assumptions used in this valuation.

Long Term Investment Earnings:	6.5% per annum
Investment Earnings in 2019-20	A loss of 4.0%
Long Term Inflationary Salary Increases:	2.5% per annum
Promotional Salary Increases:	Teacher 0.4%
	Non-teacher 0.6%
	(for a member of average age of 59 years)
	Refer Appendix E.7 for detailed rates
CPI Increases:	2.0% per annum
Long term "Real Return" over inflationary salary increases	4.0%
"Real Return" over CPI	4.5%

### Expenses

- 5.12 Fund administration expenses have been valued based on a cost per member, projected membership of each Division and assuming expenses increase at the same rate as salary inflation. As per the regulations, 30% of expenses are met by the Fund.
- 5.13 We note that as the scheme is closed, and as membership falls, the approach to projecting these expenses may need to be changed.

### Demographic Assumptions

- 5.14 The demographic assumptions which were used in the projections and valuations were set after considering the experience of contributors, preserved members and pensioners over the three-year period as well as the trends in the experience observed in previous valuations. The Scheme is sufficiently large that this experience is statistically significant, that is, the assumptions which are derived from the experience could be regarded as being reliable for the calculations.

- 5.15 Details of the experience and the rates adopted are given in Appendices C, D and E.
- 5.16 The most significant changes in assumptions related to —
- higher rates of spouse pensioner mortality;
  - lower rates of mortality improvement partly arising from the adoption of an average of the 25-year and 125-year mortality improvement rates instead of the 25-year rates; and
  - lower proportions of contributor pensioners with a spouse or putative spouse.
- 5.17 The rates of mortality for age pensioners, spouse pensioners and invalid pensioners (over 2 years in duration) have been set by adjusting the Australian Life Tables 2015-17. Details of the adjustments are given in Appendix D.

**Value of Pension Scheme Assets**

- 5.18 We have adopted the market value of assets for the Pension Scheme, which amounted to \$1,621,132,000. The use of a market value of assets is consistent with general industry practice.

**Value of Lump Sum Assets**

- 5.19 The liabilities of the Lump Sum Division are the balances of member accounts and so no adjustment is necessary for the assets of this Division. Accordingly, the market value of \$611,521,000 was used in the valuation.

**Funding Method**

- 5.20 We have used a projection and funding method known as “aggregate funding” which 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 Scheme’s investments.

## 6 Valuation Results — Lump Sum Scheme

- 6.1 There are two measures which we have used to assess the adequacy of the Fund for the Lump Sum Scheme, being —
- (i) comparison of Fund investments against member contribution accounts; and
  - (ii) projected long-term cost of the employer financed benefits of the Scheme in respect of future service only (past service costs are met from contributions paid into the Employer Account).

### **Comparison of Fund Investments against Member Contribution Accounts**

- 6.2 For the Lump Sum Scheme, the assets held by the Fund are intended to meet the employee component of the benefits payable from the Scheme. Provided that the investment returns which are allocated to employee contribution accounts are equal to the actual earning rate on the investments of the Fund (less the appropriate share of administrative costs), then the value of the investments will increase or decrease in line with the total of member contribution accounts. As a result, the liabilities of the employer should not be affected by the return on the Fund investments.
- 6.3 At 30 June 2019, the total of member accounts was \$614.8 million representing contribution accounts of \$585.7 million plus roll-in accounts of \$29.1 million, which compares with the total assets held in the Fund of \$611.6 million. This represents a deficit of \$3.2m, or 0.5% of member accounts. It is my understanding that the asset allocation of the Scheme approximately matches the asset allocation Members have chosen for their contribution accounts and that earnings are allocated to Members via changes in the unit price of the selected investment option. As a result, this shortfall will increase or decrease where there is a difference in return between the asset allocations selected and the actual assets of the Scheme. If the Scheme assets remain in the same allocation as Members' Accounts, then this difference will remain unless alternative action is taken to address the matter. If the investment returns of the Scheme assets are below those of Member Accounts, then the deficit will grow.

### **Projected Long Term Cost of the Scheme**

- 6.4 We have also considered the long-term cost of supporting the employer financed benefits in respect of future service for members of the Lump Sum Scheme. (Past service liabilities are being progressively funded by the State Government, as discussed in paragraph 3.6 of the Report).
- 6.5 For this purpose, we have projected the future experience of current contributors, and then discounted the projected future benefit payments to the valuation date. The resulting values are the present value of the employer financed portion of future service liabilities for contributory members of the Lump Sum Scheme.



6.6 The results of the calculations are as follows —

Present Value of Employer Financed Future Service Liabilities

<b>Current Contributors</b>	<b>\$'000</b>
Age Retirements	121,750
Disability	181
Invalidity	76
Deaths	1,146
Transfers	660
Resignations	354
Expenses	4,278
<b>Total Liability</b>	<b>128,445</b>

6.7 The total liability represents the present-day cost of providing employer financed benefits for the current members of the Lump Sum Scheme, based on their service after 30 June 2019. This is referred to as the “future service liability”.

6.8 The future service liability is equivalent to future employer contributions of 13.3% of contributors’ salaries.

6.9 This means that, if an amount equivalent to 13.3% of contributors’ salaries is set aside as a provision which is notionally accumulated with interest at 6.5% per annum, or invested each year, the projected future service benefits would be able to be totally met by those future provisions or investments, based on the projection assumptions.

6.10 The corresponding contribution rate at the 2016 review was 14.1%. The reduction in the contribution rate is largely due to the real discount rate over assumed salary inflation increasing from 3.0% to 4.0%.

6.11 We recommend that the current employer contribution rate of 14.75% of contributors’ salaries be maintained. Given that the declining membership could lead the calculated contribution rate to show fluctuation in future reviews, a change in contribution rate is not warranted.

### Sensitivity Analysis

6.12 The impact on the employer contribution rate as a percentage of salary from changes in the assumed discount and salary inflation rates is:-

<b>Impact of Changes to the Assumptions</b>	
Change in assumption	Employer Contribution Rate
Base	13.3%
Discount rate reduced by 1%	13.8%
Discount rate increased by 1%	12.8%
Salary inflation reduced by 1%	12.8%
Salary inflation increased by 1%	13.8%

**Risks**

- 6.13 The major risk that would impact the future service cost of the Scheme as shown above is reduced investment returns. As the Scheme is mature other changes, such as an increased rate of mortality or change in retirement ages are not expected to have a significant impact on these costs.
- 6.14 The likely main financial impact of the COVID-19 pandemic on the future cost of the Scheme is if future investment returns were to be significantly reduced. Due to the mature nature of the Scheme we consider that an increased rate of deaths would be very unlikely to have a material adverse impact on this cost. We have also reduced the assumed salary inflation rate to allow for the likely impact of the COVID-19 pandemic.
- 6.15 We note that all current contributors are permanent employees and we are not aware of any having been stood down due to the COVID-19 Pandemic. The Act does not permit the release of their defined benefits on hardship and compassionate grounds including COVID-19. However, they can take money from their rollover accounts under these circumstances. I note that allowance is currently made to reduce benefits in respect of Family Law benefits, Superannuation Surcharge and Division 293 Tax payments

## 7 Valuation Results — Pension Scheme

- 7.1 The processes which are followed to assess the financial position of the Pension Scheme are more complex than that of the Lump Sum Scheme, because of the operation of the cost sharing proportion.

### **Ability of Fund to Meet Prescribed Proportion of Costs**

- 7.2 To assess the financial position of the Pension Scheme, we have projected the future experience of current contributors, preserved members and pensioners, and then discounted these future benefit payments to the current date. The resulting values are the present value of current and future liabilities for members of the Pension Scheme, the prescribed proportion (14.0%) of which must be compared with the value of the assets of the Pension division of the Fund and the present value of future member contributions.

- 7.3 We have set out below the results of the calculations using the prescribed proportion of these liabilities —

<b>Present Value of Liabilities representing 14.0% of Prescribed Proportion</b>		
	\$'000	\$'000
<b>Current and Preserved Contributors</b>		
Age Retirements	51,119	
Invalidity Retirements	87	
Spouse and Children's Benefits	3,252	
Resignations with Cash Payments	0	
Expenses	408	54,866
<b>Current Pensioners</b>		
Age Retirements	754,379	
Invalidity Retirements	30,303	
Retrenchment Pensioners	56,347	
Pensioner Spouses	163,608	
Contributor Spouses and Children	25,364	
Expenses	7,836	1,037,837
<b>Total Liabilities</b>		<b>1,092,703</b>
 Present Value of Assets		
	\$'000	\$'000
Future Member Contributions	2,086	
Fund Investments	1,621,132	
<b>Total Assets</b>		<b>1,623,218</b>
<b>Surplus</b>		<b>530,515</b>
Less adjustment for expected negative return in 2019-20	(159,830)	
<b>Assets less liabilities ("reserve") at 30 June 2019</b>		<b>370,685</b>

- 7.4 If the current Prescribed Proportion is retained (14%), based on the projection assumptions applied in this valuation, assets are expected to exceed liabilities by \$370.7 million. This compares with a reserve of \$257.4 million at 30 June 2016.
- 7.5 The reserve of \$370.7 million represents 33.9% of total liabilities. This reserve has been built up from better than expected investment experience over the past three years even after allowing for a negative return in 2019-20. Given the high growth nature of the investment portfolio (86% in growth assets) investment returns are expected to be volatile from year to year and better than expected investment years can be followed by poorer than expected years.

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- 7.6 If no reserve is maintained for future investment losses, the Prescribed Proportion could be increased from 14% to 18.8% and the employer share reduced from 86% to 81.2%. However, it would then be likely that the employer share would increase at some future time and possibly increase to more than the current 86%.
- 7.7 A reasonable reserve to be maintained for an investment portfolio with 86% in growth assets would typically be 10% to 20% of liabilities. Maintaining this level of reserve, the Prescribed Proportion could be increased as follows:
- a. From 14% to 15.6% with a 20% reserve and employer share reducing to 84.4%; or
  - b. From 14% to 17.1% with a 10% reserve and employer share reducing to 82.9%.
- 7.8 Given the current volatility in the investment markets which appears to be heightened due to the impact of the COVID-19 pandemic it would be reasonable to maintain a reserve in the order of 20% which means the Prescribed Portion can be increased to 15% and employer share reduced to 85%.

#### **Explanation of Change in the Financial Position of the Fund**

- 7.9 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.

- 7.10 The following table sets out the major influences affecting the change in the financial position between 30 June 2016, and 30 June 2019 —

Influence	Impact \$m
<b><i>Experience</i></b>	
Interest on surplus	57.9
Investment earnings greater than expected	174.7
Salary increases lower than expected	2.3
CPI increases lower than expected	23.6
Age retirement lower than expected	1.7
Expenses higher than expected	(0.4)
Commutation higher than expected	(1.9)
Untraced	(3.0)
<b>Total Experience</b>	<b>254.9</b>
<b><i>Change in Valuation Assumptions</i></b>	
Allow for Teacher enterprise agreements before 30 June 2019 not in the member data	(0.4)
Revised age retirements	0.4
Revised salary promotion	0.2
Revised pensioner mortality assumptions	8.9
Revised pensioner proportion married	6.2
Revised pensioner commutation	(1.3)
Revised economic assumptions	4.2
Adjustment for negative return in 2019-20	(159.8)
<b>Total Change in Valuation Assumptions</b>	<b>( 141.6)</b>
<b>Net Change in reserve</b>	<b>113.3</b>

- 7.11 The major contributing factors to the change in surplus were as follows:—

*(i) Investment Earnings*

Investment returns were 3.6% per annum more than assumed over the 3-year period. However, this has been largely offset by allowing for the expected return in 2019-20 of 9.9% less than expected.

*(ii) Pension increases*

Pension increases were 0.8% per annum less than assumed over the 3-year period.

**Projected Cost of Pension Scheme**

- 7.12 The cost sharing arrangements apply to past service liabilities. For liabilities which accrue based on service after 30 June 2019, employing agencies contribute at a rate which if accumulated with interest is expected to fully meet the cost of these future liabilities (after allowing for expected future member contributions which also fund future service liabilities).

- 7.13 The results of the calculations are as follows:

### Present Value of Employer Share of Future Service Liabilities

	\$'000
<b>Current Contributors</b>	
Total Benefits	21,041
Plus Expenses	135
Less Member Contributions	-2,086
<b>Total Future Service Liabilities as at 30 June 2019 to be paid by Employer</b>	<b>19,090</b>

- 7.14 Our calculations produce a future service liability which is equivalent to future contributions of 23.9% of contributors' salaries. This means that, if an amount equivalent to 23.9% of contributors' salaries is set aside as a provision which is notionally accumulated with interest at 6.5% per annum, or invested each year, the projected future service benefits would be able to be totally met by those future provisions or investments, based on the projection assumptions. This represents a decrease from the contribution rate of 25.8% of contributor salaries calculated as at the 2016 review. About half this reduction is due to the reduction in assumed future salary increases. Changes in membership profile and assumed rates of retirement, mortality for spouses and proportion married also reduced the rate.
- 7.15 As the employer contribution rate only applies to 303 remaining members and the reduction is relatively small, it would be reasonable to maintain an employer contribution rate of 26.0% of contributors' salaries.

### Sensitivity Analysis

- 7.16 The impact on the Fund share of benefits and the employer contribution rate as a percentage of salary from changes in the assumed discount rate is:-

#### Impact of Changes to the Assumptions

Assumption	Fund Share (Excluding surplus)	Employer Contribution Rate
Base	18.8%	23.9%
Discount rate reduced by 1%	17.2%	27.5%
Discount rate increased by 1%	20.4%	20.9%
CPI Inflation rate reduced by 1%	20.4%	21.4%
CPI Inflation rate increased by 1%	17.1%	26.9%
Mortality rate reduced by 10%	18.4%	23.6%
Mortality rate increased by 10%	19.2%	24.3%

**Risks**

7.17 The major risks that would impact the future service cost of the Scheme are:

- a. reduced investment returns;
- b. an increase in CPI inflation;
- c. a significant drop in mortality; and
- d. a significant change in rates of marriage or age of spouse.

Should the percentage of members married be much higher than assumed, or spouses be much younger than assumed, then the costs would increase.

7.18 The likely main impact of the COVID-19 pandemic on the future cost of the Scheme is if future investment returns were to be significantly reduced. We have reduced the assumed salary inflation rate to allow for the likely impact of the COVID-19 pandemic and have reduced the assumed investment return for the year ending 30 June 2020. While the assumed CPI inflation rate has been reduced, the assumed investment return has also been reduced, offsetting the impact of the reduced CPI inflation rate.

7.19 While an increase in mortality would reduce the cost of the Scheme, it is possible that because of the COVID-19 Pandemic more attention will be paid to disease control, reducing mortality rates and increasing the cost to the Scheme. We do not expect that this will have a significant impact on the Scheme.

7.20 We note that all current contributors are permanent employees and we are not aware of any having been stood down due to the COVID-19 Pandemic. The Act does not permit the release of their defined benefits on hardship and compassionate grounds including COVID-19. However, they can take money from their rollover accounts under these circumstances. I note that allowance is currently made to reduce benefits in respect of Family Law benefits, Superannuation Surcharge and Division 293 Tax payments.

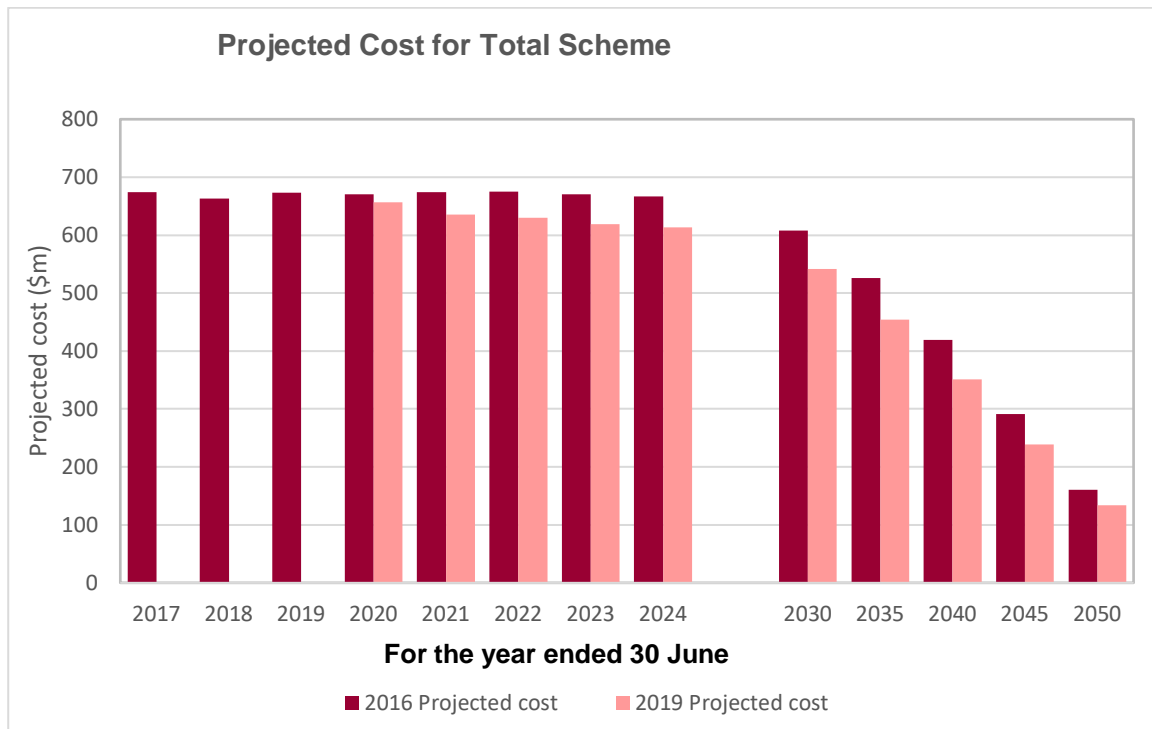


## 8 Projected Cost to The State Government

- 8.1 We have projected the cost of the Lump Sum and Pension Schemes using the assumptions described in this Report, assuming the recommended cost sharing arrangements (refer paragraph 7.12) will apply in the future.
- 8.2 The State Government costs include the employer share of benefits for all Departments and Agencies except those classified as Commercial. Also, the share of benefits met by the Commonwealth Government in respect of University are excluded.
- 8.3 The projected costs to the State Government (expressed in current salary and dollar terms as well as nominal dollars) are set out in the table below —

Year Ended 30 June	In current salary and dollar terms			In nominal dollar terms		
	Pension Scheme \$ m	Lump Sum Scheme \$ m	Total Cost \$ m	Pension Scheme \$ m	Lump Sum Scheme \$ m	Total Cost \$ m
2020	506	145	651	511	146	657
2021	493	119	612	512	123	635
2022	481	112	593	511	119	630
2023	468	100	568	510	109	619
2024	455	94	549	508	105	613
2030	370	48	418	480	62	542
2035	293	18	311	429	25	454
2040	209	2	211	347	4	351
2045	128	—	128	239	—	239
2050	63	—	63	134	—	134
2055	23	—	23	57	—	57

- 8.4 The graph below shows the projected costs to the State Government in 2016 compared with the projected costs now (both in nominal terms).



8.5 The graph shows the projected costs have declined three years on. The reasons for the decline are reductions in past and assumed future CPI increases, mortality improvement rates and proportion married along with an increase in assumed spouse mortality.

### Risks

8.6 The major risks that would impact the projected cost of the Scheme are:

- a. reduced investment returns;
- b. an increase in CPI inflation;
- c. a significant drop in mortality; and
- d. a significant change in rates of marriage or age of spouse.

As most members are retired, or close to retirement, we consider that higher than expected salary increases are not a significant risk. Should the percentage of members married be much higher than assumed, or spouses be much younger than assumed, then the costs would increase.

8.7 The likely main impact of the COVID-19 pandemic on the future cost of the Scheme is if future investment returns were to be significantly reduced. We have reduced the assumed salary inflation rate to allow for the likely impact of the COVID-19 pandemic and have reduced the assumed investment return for the year ending 30 June 2020. While the assumed CPI inflation rate has been reduced, the assumed investment return has also been reduced, offsetting the impact of the reduced CPI inflation rate.

## 9 Membership Data

- 9.1 We have been able to use the membership data which has been extracted from the administration system used by the Superannuation Office for the ongoing administration of the Schemes. We have been able to satisfy ourselves that the data is sufficiently accurate for our calculations, and consider that any errors in the recording of member information would not have a material impact on our conclusions.
- 9.2 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.
- 9.3 The quality of the administration records is being continually enhanced, and the amount of information which has been able to be used about preserved members has been of assistance in the projection process.
- 9.4 While we would expect that there will be adjustments to the member data after 30 June 2019, we would not expect that it would have a material impact on our calculations and conclusions.
- 9.5 We have provided details of membership and its changes during the three-year period in Appendix B of this Report.

## 10 Conclusion and Review of Recommendations

- 10.1 In this Report, we have set out our comments about the funding status of the South Australian Superannuation Scheme, in the Lump Sum and Pension sections.
- 10.2 We recommend that the employer contribution rate for the employer share of the future service cost of the Lump Sum Scheme be maintained at 14.75% of contributors' salaries.
- 10.3 We recommend that the employer contribution rate for the employer share of the future service cost of the Pension Scheme be maintained at 26.0% of contributors' salaries.
- 10.4 Given the current volatility in the investment markets, it would be reasonable to maintain a reserve in the order of 20% in the Pension Scheme which means the Prescribed Portion can be increased to 15% and employer share reduced to 85%.
- 10.5 The next review should be completed with an effective date of 30 June 2022.



Geoff Keen FIAA

June 2020

## APPENDIX A — BENEFITS AND CONTRIBUTIONS

### A1 Overview

- A1.1 The State Superannuation Scheme is closed to new members. State Government employees who are not members are automatically covered by the Southern State Superannuation Scheme. This scheme provides for both non-contributory and contributory members.
- A1.2 This description of the Scheme is intended to provide a good general understanding of the benefit entitlements of active contributors to the Scheme who are in full-time employment, but it should not be used as a substitute for the actual legislation.
- A1.3 There are two distinct types of benefit payable under the Scheme namely those payable to old scheme or pension benefit members, being members who were accepted as contributors before 31 May 1986; and those payable to new scheme or lump sum benefit members, being members who were accepted as contributors before 4 May 1994. The new scheme benefits are split into two components, an employee component and an employer component.
- A1.4 Benefits are based on contribution points. One contribution point is awarded for each month of contribution at the Standard Contribution Rate. Proportional contribution points are awarded for higher or lower contribution rates and for part-time employees. The Standard Contribution Rate is 6% of salary but members may elect, from time to time, to contribute at 3%, 4.5%, 6%, 7.5% or 9%. Contributors may also elect to cease contributing. The maximum number of points that count towards benefits is an average of one per month of membership. No contribution points accrue during periods of cessation of contribution payments.

### A2 Old Scheme or Pension Benefit Member Entitlements

#### A2.1 Retirement Benefits

The normal retirement age is 60 for most members. A contributor who has reached this age is entitled to a pension calculated in the following manner:

$$P = FS \times A \times \frac{2}{3} \times \left(1 + \frac{X}{E}\right) + \frac{FS}{100} + FS \times \frac{7.4}{100} \times \frac{n}{420}$$

where

FS is the contributor's final salary;

A is the lesser of unity and the numerical value obtained by dividing the number of the contributor's accrued contribution points by the larger of 360 and the number of months between the contributor's date of acceptance and the age of retirement;

X is the number of months by which the contributor's age at retirement exceeds the age of retirement, as defined in the Superannuation Act 1988;

E is (a) in relation to a contributor whose contribution period at the age of retirement was 360 months or more — 600;

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(b) in relation to a contributor whose contribution period at the age of retirement was 300 months or more but less than 360 months — 1200.

$n$  is 420 or the aggregate number of contribution points that accrued to the contributor between 1 July 1992, and the date of retirement whichever is the lesser (contribution points are taken to accrue at the rate of one per month where a contributor has attained the maximum number of points for the purpose of calculating  $A$  above).

The retirement pension is subject to a maximum of 75% of the contributor's salary immediately before retirement.

## A2.2 Early Retirement Benefits

A contributor who retires after reaching age 55 but before the age of retirement is entitled to a pension calculated as follows:

$$P = FS \times A \times \left( \frac{50}{100} + \frac{17.6}{100} \times \frac{n_2}{60} \right) + FS \times \frac{n_1}{420} \times \left( \frac{6}{100} + \frac{1.4}{100} \times \frac{n_2}{60} \right)$$

where

$FS$  is the contributor's final salary;

$A$  is the lesser of unity and the numerical value obtained by dividing the number of the contributor's accrued contribution points by the larger of  $(300 + n_2)$  and the number of months between the contributor's date of acceptance and the date of retirement;

$n_1$  is 420 or the aggregate number of contribution points that accrued to the contributor between 1 July 1992, and the date of retirement whichever is the lesser (contribution points are taken to accrue at the rate of one per month where a contributor has attained the maximum number of points for the purpose of calculating  $A$  above);

$n_2$  is the number of months between the day on which the contributor reached the age of 55 years and the day of retirement.

## A2.3 Retrenchment Benefits

Two forms of retrenchment benefits are payable.

1. A contributor, who is aged over 45 and has belonged to the pension scheme for five years or more, is entitled to a pension and lump sum calculated as follows:

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

$$LS = FS \times \frac{0.85}{450} \times M$$

where

$FS$  is the contributor's final salary;

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A is calculated in the same manner as for the retirement benefit at age 60 but with prospective service to age 60 being included;

M is the number of months of the contributor's contribution period occurring after 31 December 1987.

2 Where a contributor is not entitled to a retrenchment pension, a lump sum benefit is payable, consisting of the two components:

- (a) an amount equivalent to the amount standing to the credit of the contributor's contribution account; and
- (b) an amount equal to:

$$2 \frac{1}{3} \times A - P + FS \times \frac{0.85}{450} \times M$$

where

FS is the contributor's final salary;

A is the lesser of the aggregate of the contributor's contributions and an amount that would have been equal to the aggregate of the contributor's contributions if the contributor had contributed throughout at the standard contribution rate;

P is the amount of any pension paid under the Act to the contributor;

M is the number of months of the contributor's contribution period occurring after 31 December 1987.

Alternatively, a contributor who is not entitled to a retrenchment pension may:

- (a) if the contributor has not reached the age of 55, preserve, or
- (b) if the contributor has reached the age of 55, receive age retirement benefits.

#### A2.4 Disability Pensions

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:

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

where

FS is the contributor's final 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.

#### A2.5 Invalidity Pensions

When a contributor's employment is terminated because of invalidity, an invalidity pension is payable. The amount of the pension is calculated as follows:

$$P = FS \times A \times \frac{2}{3} + \frac{FS}{100} + FS \times \frac{7.4}{100} \times \frac{n}{420}$$

where

FS is the contributor's final 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;

n is calculated in the same manner as for the retirement benefit

#### A2.6 Minimum Pension at age 60 but with prospective service to age 60 being included

The minimum amount paid in respect of a contributor who commences a pension is the amount of pension that would be payable for a period of 4.5 years.

#### A2.7 Pensions payable on death of a contributor

When a contributor dies a surviving eligible spouse is entitled to a pension equal to two-thirds of the deceased contributor's notional pension.

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 pension is also payable.

Where a spouse 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 pension is payable, an orphan's benefit is payable varying from 45% of the deceased contributor's notional pension for one child to a maximum equal to 100% of the deceased contributor's notional pension divided among four or more eligible children. A lump sum is also paid equal to the greater of the balance of the contributor's contribution account and twice the contributor's final salary.

Where no spouse or child pension is payable, a lump sum is payable which is similar to the age retirement benefit under the Lump Sum scheme.

#### A2.8 Resignation Benefits

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.

The form of the preserved benefit is determined by the contributor's length of contributory membership before resignation. For contributors with less than ten



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years membership, the benefit is in the form of a lump sum, while for contributors with ten years or more membership, the benefit is in the form of a pension.

The lump sum preserved benefit consists of the two components:

- (a) an amount equivalent to the amount standing to the credit of the contributor's contribution account; and
- (b) an amount equal to:

$$2 \frac{1}{3} \times A + AFS \times \frac{0.85}{450} \times M$$

where

- A is the lesser of the balance of the contributor's contribution account and an amount that would have been equal to the balance of the contributor's contribution account if the contributor had contributed throughout at the standard contribution rate;
- AFS is the contributor's salary on resignation adjusted to reflect changes in the CPI since the date of resignation;
- M is the number of months of the contributor's contribution period occurring after 31 December 1987.

The preserved pension is calculated as if the member had remained in employment until retirement but had not paid any contributions from the date of resignation. The contributor's salary on resignation is adjusted for changes in the CPI.

If a contributor elects to receive an immediate cash payment of the balance of their contribution account, the contributor will also be entitled to a preserved benefit equal to the aggregate of:

$$AFS \times \frac{0.85}{450} \times M$$

and

a preserved amount equal to the superannuation guarantee benefit in respect of service after 30 June 1992 accumulated with interest.

where

- AFS is the contributor's salary on resignation adjusted to reflect changes in the CPI since the date of resignation;
- M is the number of months of the contributor's contribution period occurring between 31 December 1987, and 1 July 1992.

## A2.9 Commutation

On retirement, or attainment of age 60 in the case of invalidity or age 55 for retrenchment pensioners, the whole or part of pension entitlements may be commuted for a lump sum. The commutation basis is independent of sex or marital status. At age 65 an amount of \$9.50 is paid for each dollar of pension commuted and this amount increases linearly to \$11.50 at or below age 55. The limits on amounts that may be commuted were removed as from 1 July 2001 except that retrenchment pensioners who are subject to a reduction in pension can only commute the pension actually being paid.

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

## A2.10 Voluntary Separation Package Benefits

Contributors aged less than 55 who accept voluntary separation packages can elect to take their normal preserved resignation benefits. Alternatively, they are entitled to receive cash lump sum benefits, while those aged 45 or more at resignation may instead choose to receive a pension.

The cash lump sum benefits are equal to

- (a) an employee component equal to their contribution accounts balance, plus
- (b) an amount equal to the lesser of 2.5 times the employee component or 2.5 times the amount that would have constituted the employee component if the contributor had contributed throughout at the standard contribution rate. A part of this component equal to the minimum superannuation guarantee amount needs to be preserved to age 55.

The pension benefit for those aged 45 or more at resignation is calculated as follows:

$$P = FS \times \left[ \frac{A \times \{22 + [(2.1 + 0.07 \times (X - 45)) \times (X - 45)]\}}{100} \right] \times \left[ 1 + \left( \frac{n}{420} \times \frac{6}{A} \times \frac{1}{50} \right) \right]$$

where

- FS is the contributor's final salary;
- A is the lesser of unity and the numerical value obtained by dividing the number of the contributor's accrued contribution points by the larger of the number of months between the date of acceptance as a contributor and the date of resignation, and the number of months between the contributor's 30<sup>th</sup> birthday and the date of resignation;
- X is the contributor's age at resignation in years and completed months expressed to two decimal places;
- n is the lesser of 420 and the number of contribution points that accrued to the contributor between 1 July 1992, and the date of resignation.

Contributors who accept voluntary separation packages with a pension benefit are entitled to commute those pensions.

These benefits are also known as Targeted Separation Packages or TSP's.

#### A2.11 Ceasing of Member Contributions

Member contributions cease when a member has attained the age of retirement and where the number of accrued contribution points equals the larger of 360 and the number of months between the contributor's date of acceptance and the age of retirement. Members who joined prior to the Repealed Act cease contributions when 360 points are accrued on or after the age of retirement.

#### A3 New Scheme or Lump Sum Benefit Member Entitlements

A3.1 As mentioned earlier new scheme benefit entitlements are split into two components.

A3.2 The employee component is simply the member's own contributions accumulated with interest at the rates of return credited to new scheme contributors' contribution accounts by the Board. This component is paid in addition to any employer component (EC) of a benefit.

#### A3.3 Retirement Benefits

A retirement benefit may be paid after age 55 and the employer component is equal to the lesser of:

$$EC = FS \times A \times 4.5 + FS \times \frac{0.85}{300} \times M$$

and

$$EC = FS \times 4.5 \times \left(1 - \frac{X}{420}\right) + FS \times \frac{0.85}{300} \times M$$

where

FS is the contributor's final salary;

A is the lesser of unity and the numerical value obtained by dividing the number of the contributor's accrued contribution points by 420;

M is the number of months of the contributor's contribution period occurring after 30 June 1992;

X is the number of months by which the contributor's age falls short of 60 years.

#### A3.4 Resignation Benefits — Without Preservation

If on resignation prior to age 55 contributors elect not to preserve their entitlements but to receive immediate cash payments of the balances of their contribution accounts, they are also entitled to a preserved amount equal to the superannuation guarantee benefit in respect of service after 30 June 1992 accumulated with interest.

### A3.5 Resignation Benefits — With Preservation

If on resignation prior to age 55 contributors elect to preserve their entitlements, the employee components remain in the Fund and benefits are only paid on death, becoming incapacitated and on age retirement. The benefits paid are calculated as if the member had remained in employment until retirement but had not paid any contributions from the date of resignation. The contributor's salary on resignation is adjusted for changes in the CPI.

### A3.6 Transfers

On transfer to an approved superannuation scheme the amount transferred is the balance of the contributor's contribution account plus an employer component equal to the aggregate of:

- (a) an amount equal to the lesser of twice the above employee component or twice the amount that would have constituted the employee component if the contributor had contributed throughout at the standard contribution rate; and
- (b) an amount equal to:

$$FS \times \frac{0.85}{300} \times M$$

where

FS is the contributor's final salary;

M is the number of months of the contributor's contribution period occurring after 30 June 1992.

### A3.7 Retrenchment Benefits

On retrenchment a member can elect either to receive an immediate lump sum equal to the amount of the transfer benefit, or to take a preserved resignation benefit.

### A3.8 Invalidation Benefits

A member aged less than 55 who is incapacitated is entitled, in the first instance, to a temporary disability pension of 2/3rds of salary for a period of up to 12 months. This may be extended to 18 months in special circumstances.

If a member's employment is terminated because of invalidity before age 55 the temporary disability pension ceases and a lump sum is paid. The employer component of the benefit is as follows:

$$EC = (FS \times A \times 3.86) + X + \left( FS \times \frac{0.85}{300} \times M \right)$$

where

FS is the contributor's final salary;

A is the lesser of unity and the numerical value obtained by dividing "p" by 360, where

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- p is the contributor's accrued contribution points plus a proportion of the number of months from the date of invalidity to age 55. The proportion equals one minus the extent of incapacity for workers' compensation purposes;
- X is the amount (if any) by which the employee component falls short of twice the contributor's final salary;
- M is the number of months of the contributor's contribution period occurring after 30 June 1992.

### A3.9 Death Benefits — for Surviving Spouses

The lump sum paid to a surviving spouse on death is the same as the invalidity benefit except that:

- (a) the multiple of 3.86 is replaced by a multiple of 3.0; and
- (b) in the calculation of "p", months are taken to age 60 instead of to age 55.

### A3.10 Death Benefits — for Eligible Children

Pensions payable to each eligible child are calculated as follows.

- (1) Where a spouse pension is payable and there are less than 4 eligible children:

$$P = A \times .05 \times FS$$

- (2) Where a spouse pension is payable and there are 4 or more eligible children:

$$P = \frac{A \times .15 \times FS}{\text{number of children}}$$

- (3) Where there is no spouse pension payable and there are less than 4 eligible children:

$$P = A \times .15 \times FS$$

- (4) Where there is no spouse pension payable and there are 4 or more eligible children:

$$P = \frac{A \times .45 \times FS}{\text{number of children}}$$

where

A is the lesser of unity and the numerical value obtained by dividing the number of the contributor's extrapolated contribution points by 420

FS is the contributor's final salary.

In (3) and (4) above a lump sum is also paid to the estate of the contributor. The amount of this lump sum equals the aggregate of:

- (a) the greater of the balance of the deceased contributor's contribution account or twice the deceased contributor's salary; and
- (b) an amount equal to:

$$FS \times \frac{0.85}{300} \times M$$

where

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FS is the contributor's final salary;

M is the number of months of the contributor's contribution period occurring after 30 June 1992.

#### A3.11 Death Benefits — with neither spouses nor eligible children

On death where there is neither a surviving spouse nor any eligible children the employer benefit is the same as the age retirement benefit.

#### A3.12 PSESS Benefits

Where a contributor is entitled to a benefit from the new scheme, the contributor is also entitled to an amount equal to the balance of the contributor's account in the Public Sector Employees Superannuation Scheme as at 30 June 1992 plus investment earnings credited to that balance at the same rate as for the new division of the Fund.

#### A3.13 Voluntary Separation Package Benefits

Contributors aged less than 55 who accept voluntary separation packages can elect to take their normal preserved resignation benefits. Alternatively, they are entitled to receive cash lump sum benefits equal to:

- (a) an employee component equal to their contribution account balance, plus
- (b) an amount equal to the lesser of twice the above employee component or twice the amount that would have constituted the employee component if the contributor had contributed throughout at the standard contribution rate. A part of this component equal to the minimum superannuation guarantee amount needs to be preserved to age 55.

These benefits are also known as Targeted Separation Packages or TSP's.

## APPENDIX B — MEMBERSHIP INFORMATION

### B.1 Contributor Record Details

Department  
Date of birth  
Date started service  
Actual and notional dates of joining the Scheme  
Salary  
Sex  
Scheme code  
Exit code  
Full or limited benefits indicator  
Contribution rate  
Accrued points  
Contribution account balance  
Other factors for special benefit modifications

### B.2 Pensioner Record Details

Department  
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 child pensioners  
Commutation details  
Basic pension  
Supplementation pension

## B.3 Summary of Contributor Movements for the Three Years to 30 June 2019

<b>Pension Scheme</b>	<b>Teachers</b>		<b>Other Employees</b>		<b>Total</b>
	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>	
New Entrants	—	—	—	—	—
Age retirements	104	66	173	29	372
Invalidity / disability	1	1	—	—	2
Deaths	2	—	3	—	5
Resignations (with refund)	—	—	—	—	—
Resignations (preserved)	—	—	1	—	1
Resignations (transfer)	—	—	—	—	—
Retrenchments	—	—	—	1	1
Targeted Separation Packages	—	—	—	1	1
Other	—	—	—	—	—
<b>Total Exits</b>	<b>107</b>	<b>67</b>	<b>177</b>	<b>31</b>	<b>382</b>

<b>Lump Sum Scheme</b>	<b>Teachers</b>		<b>Other Employees</b>		<b>Total</b>
	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>	
New Entrants	—	—	—	—	—
Age retirements	87	233	243	294	857
Invalidity / disability	—	1	1	—	2
Deaths	—	—	5	4	9
Resignations (with refund)	—	—	—	—	—
Resignations (preserved)	—	7	6	9	22
Resignations (transfer)	2	7	13	11	33
Retrenchments	—	—	—	—	—
Targeted Separation Packages	—	—	—	—	—
Other	—	—	—	—	—
<b>Total Exits</b>	<b>89</b>	<b>248</b>	<b>268</b>	<b>318</b>	<b>923</b>



## B.4 Summary of Contributor Details as at 30 June 2019

<b>Pension Scheme</b>	<b>Teachers</b>		<b>Other Employees</b>		<b>Total</b>
	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>	
<b>Contributors</b>					
Number	51	59	145	48	303
	\$'000	\$'000	\$'000	\$'000	\$'000
Annual salaries	5,793	6,233	15,750	5,051	32,827
Contributions	100	232	353	144	829
Account balances	20,443	20,479	50,584	15,999	107,505
<b>Preserved members</b>					
Number	11	4	67	27	109
	\$'000	\$'000	\$'000	\$'000	\$'000
Account balances	1,584	523	10,739	2,864	15,710
Number of SG preserved contributors	16	8	83	24	131
<b>Lump Sum Scheme</b>					
<b>Lump Sum Scheme</b>	<b>Teachers</b>		<b>Other Employees</b>		<b>Total</b>
	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>	
<b>Contributors</b>					
Number	186	426	733	761	2,106
	\$'000	\$'000	\$'000	\$'000	\$'000
Annual salaries	21,264	44,374	84,989	71,047	221,674
Contributions	1,310	2,543	5,086	3,835	12,774
Account balances	55,400	107,069	207,080	158,994	528,543
<b>Preserved &amp; Disability Contributors</b>					
Number	24	82	276	303	685
	\$'000	\$'000	\$'000	\$'000	\$'000
Account balances	3,019	7,394	23,835	22,957	57,205
Number of SG preserved contributors	11	20	144	146	321

In addition to the above, the lump sum scheme includes rollover accounts of \$29.1 million.

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## B.5 Summary of Contributors by Age as at 30 June 2019

Pension Scheme	Teachers		Other Employees		Total
	Males	Females	Males	Females	
40 – 44	—	—	—	—	—
45 – 49	—	—	—	—	—
50 – 54	1	1	16	10	28
55 – 59	11	20	47	14	92
60 – 64	21	29	57	16	123
65 and over	18	9	25	8	60
<b>Total</b>	<b>51</b>	<b>59</b>	<b>145</b>	<b>48</b>	<b>303</b>

Lump Sum Scheme	Teachers		Other Employees		Total
	Males	Females	Males	Females	
45 – 49	6	19	36	71	132
50 – 54	29	91	143	154	417
55 – 59	76	123	227	224	650
60 – 64	57	127	243	205	632
65 – 69	16	52	68	82	218
70 and over	2	14	16	25	57
<b>Total</b>	<b>186</b>	<b>426</b>	<b>733</b>	<b>761</b>	<b>2,106</b>

## B.6 Summary of Pensioner Details as at 30 June 2019

	Number	Annual Pensions \$'000	
<b>Age retirements</b>			
Males	8,063	412,027	
Females	1,986	83,946	
Total	10,049		495,973
<b>Retrenchments</b>			
Males	878	36,745	
Females	60	2,993	
Total	938		39,738
<b>Invalidity retirements</b>			
Males	422	17,791	
Females	143	5,280	
Total	565		23,071
<b>Spouses of deceased members</b>			
Male pensioners	107	2,474	
Female pensioners	2,831	73,800	
Total	2,938		76,274
<b>Non-member spouses</b>			
Male pensioners	—	—	
Female pensioners	43	975	
Total	43		975
<b>Children of deceased members</b>			
Total	11		77
<b>Total</b>	<b>14,544</b>		<b>636,108</b>

*Note: The table above includes 3 children of deceased member pensions paid under the Lump Sum scheme*

## B.7 Summary of Pensioners by Age as at 30 June 2019

Age	Age		Invalidity		Spouse		Total		Total
	M	F	M	F	M	F	M	F	
45 – 49	—	—	—	—	—	4	—	4	4
50 – 54	1	—	—	2	2	11	3	13	16
55 – 59	61	19	5	3	1	17	67	39	106
60 – 64	773	219	27	11	1	84	801	314	1,115
65 – 69	1,869	430	64	23	12	209	1,945	662	2,607
70 – 74	2,337	461	126	40	23	399	2,486	900	3,386
75 – 79	1,686	354	81	27	18	453	1,785	834	2,619
80 – 84	1,060	263	52	13	19	543	1,131	819	1,950
85 – 89	709	169	44	14	19	595	772	778	1,550
90 – 94	353	88	20	8	9	413	382	509	891
95 – 99	86	39	3	1	3	123	92	163	255
100 – 104	6	4	—	1	—	23	6	28	34
105 – 109	—	—	—	—	—	—	—	—	—
<b>Total</b>	<b>8,941</b>	<b>2,046</b>	<b>422</b>	<b>143</b>	<b>107</b>	<b>2,874</b>	<b>9,470</b>	<b>5,063</b>	<b>14,533</b>

*Note: Table above excludes 11 child pensioners*

## APPENDIX C — CONTRIBUTOR EXPERIENCE

### C.1 Introduction

The experience of contributors during the three years to 30 June 2019 has been examined and compared with that assumed in the previous actuarial investigation. The total years of exposure during the period were as follows:

		Years of Exposure	
		Pension Scheme	Lump Sum Scheme
Males	Teachers	279	699
	Other	676	2,598
	Total	955	3,297
Females	Teachers	255	1,637
	Other	183	2,734
	Total	438	4,371
Total		1,393	7,668

During the three years to 30 June 2019, there has been a significant reduction in members of both the Pension and Lump Sum schemes.

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.

### C.2 Contributor Mortality

The mortality assumptions used in the 2016 investigation of the State Scheme were based the Australian Life Tables 2010-12 with adjustments for mortality improvement for five years. The Australian Life Tables 2015-17, with adjustments for mortality improvement for three years, have been used to produce the 2019 mortality assumptions.

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

	Pension Scheme		Lump Sum Scheme	
	Males	Females	Males	Females
Actual deaths	5	—	5	4
Expected deaths	2	1	6	5

The mortality rates adopted have been set at 35% of the Australian Life Tables 2015–17 adjusted for 5 years of mortality improvement. This proportion is the same proportion adopted as in the 2016 investigation.

### C.3 Invalidity Retirement

The invalidity experience was as shown below. The numbers include invalidity retirements and temporary disablements where members have not returned to work.

	Pension Scheme		Lump Sum Scheme	
	Males	Females	Males	Females
Actual invalids	1	1	1	1
Expected invalids	1	0	1	2

The existing rates have been retained.

### C.4 Resignation

The rates of resignation experienced in the three years to 30 June 2019 are shown below, subdivided by scheme, age, sex and teacher / non-teacher status.

Age	Resignations			
	Teachers		Other	
	Males	Females	Males	Females
<b>Pension Scheme</b>				
45 – 49	—	—	—	—
50 – 54	—	—	0.013	0.028
<b>Lump Sum Scheme</b>				
45 – 49	—	0.035	0.014	0.015
50 – 54	0.016	0.027	0.028	0.027

A comparison of actual and expected resignations for the period is as follows:

	Teachers		Other	
	Males	Females	Males	Females
<b>Pension Scheme</b>				
Actual resignations	—	—	1	1
Expected resignations	0	0	2	1
<b>Lump Sum Scheme</b>				
Actual resignations	2	14	19	20
Expected resignations	3	8	22	25

The number of resignations in the last three years is low and reasonably close to expected for Lump Sum and Pension Schemes. The existing rates have been retained.

### C.5 Pension Scheme members Preservation

Two Pension Scheme members have resigned since 2016 and one preserved their entitlements.

The assumed proportions in the 2016 basis have been retained.

## C.6 Lump Sum Scheme Members Transfer and Preservation

### *Current Contributors*

The following table shows the percentages of resigning contributors who preserved or transferred their entitlements to an approved superannuation fund during 2016-19.

Age	Preserved	Transfer
Up to 45	0.00	1.00
46	1.00	0.00
47	0.75	0.25
48	0.33	0.67
49	0.33	0.67
50 and over	0.36	0.64

The withdrawal experience has shown that no members took a cash refund over the three years to 30 June 2019 and we expect this trend to continue. The assumptions have thus been revised to reflect no cash refunds and an increase in the percentage of transfers to 70% across all ages.

### *Preserved Contributors*

A rate of 2% of preserved members per annum are assumed to transfer their entitlements to an approved superannuation fund.

## C.7 Age Retirement

Actual and expected age retirements for the three years to 30 June 2019 were as follows:

	Teachers		Other	
	Males	Females	Males	Females
<b><i>Pension Scheme</i></b>				
Actual retirements	104	66	173	29
Expected retirements	107	82	210	49
<b><i>Lump Sum Scheme</i></b>				
Actual retirements	87	233	243	294
Expected retirements	83	235	316	355

Contributors may choose to retire after age 55, although the scheme is designed around a normal retiring age of 60. Age retirement rates are higher for Pension Scheme members than for Lump Sum Scheme members. The Pension Scheme experience over the last three years has shown less retirements than expected for both males and females. For Lump Sum Scheme members, there were less retirements except for male Teachers. New rates have been adopted for both scheme members with separate rates for Teachers and Others. There are now 60 Pension Scheme members and 275 Lump Sum Scheme members over age 65.

### C.8 Age Retirement of Preserved Contributors

Actual and expected age retirements for the three years to 30 June 2019 were as follows:

	Teachers		Other	
	Males	Females	Males	Females
<b><i>Pension Scheme</i></b>				
Actual retirements	8	9	46	11
Expected retirements	27	14	141	44
<b><i>Lump Sum Scheme</i></b>				
Actual retirements	6	12	64	60
Expected retirements	26	39	169	163

Pension and Lump Sum Scheme experience over the last three years have shown less retirements than expected. The 2019 rates have been adjusted accordingly.

### C.9 Retrenchment

The numbers of retrenchments during the three years to 30 June 2019 were as follows:

Males	—
Females	1

Because of the unpredictable nature of retrenchment, no allowance has been made in this investigation for future retrenchments.

### C.10 Voluntary Separation Packages

The Superannuation Act was first amended in May 1993 to provide the option of an additional cash benefit payable to contributors who resign pursuant to a voluntary separation package (VSP).

No allowance has been made for future VSP benefits.



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**C.11 Promotional Salary Increases**

Promotional salary increases experienced were lower than expected as follows:

<i>Promotional</i> Salary Increases	Teachers		Other	
	Males	Females	Males	Females
	% pa	% pa	% pa	% pa
Actual increase	0.3	0.5	0.9	0.6
Expected increase	0.7	0.7	0.9	1.0

These promotional increases, along with inflationary increases, were reflected in the Total salary increases as follows:

<i>Total</i> Salary Increases	Teachers		Other	
	Males	Females	Males	Females
	% pa	% pa	% pa	% pa
Actual increase	2.0	2.1	3.0	2.8
Expected increase	4.0	4.1	4.3	4.3

New promotional salary scales for Teachers and Other members have been adopted as set out in Appendix E.7.

**C.12 Commutation**

For the three years ended 30 June 2019 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	27	26	7
Females	17	31	6
Invalidity retirements			
At start of pension	—	—	—
At age 60	4	80	3
Spouses	22	61	12

Commutation rates for the last three years have been lower than expected. The percentage adopted for age retirements has been reduced from 7.5% to 6.0%; from 10.0% to 9.0% for invalid retirements and from 15.0% to 13% for spouses.

### C.13 Family Statistics

The family statistics experience over the period from 1 July 2014 until the date of data extraction is as follows:

	Proportion Married		Age Difference	
	Males	Females	Males	Females
Actual	0.57	0.19	4.35	-1.36
Expected	0.64	0.27	4.29	-1.57

To value benefits payable to spouses and children, assumptions are needed regarding:

- (a) the proportions of contributors married at each age;
- (b) the age differences between contributors and their spouses; and
- (c) details of the children of contributors.

The proportions married have largely been reduced for males and females. At age 65, the proportion has been reduced from 83% to 78% for males and from 61% to 56% for females.

**C.14 Contribution Rates**

The distribution of contribution rates as at 30 June 2019 was as follows:

<b>Pension Scheme Contribution Rates (% of salary)</b>								
Age	0	1.5	3	4.5	6	7.5	9	Total
<b>Male</b>								
45 – 54	—	—	—	—	17	—	—	17
55 – 59	—	—	—	—	56	1	1	58
60 – 64	74	—	—	—	3	—	1	78
65 –	41	—	—	1	1	—	—	43
Total	115	—	—	1	77	1	2	196
<b>Female</b>								
45 – 54	—	—	1	1	8	1	—	11
55 – 59	—	—	2	—	30	—	2	34
60 – 64	21	—	1	—	20	1	2	45
65 –	15	—	—	—	2	—	—	17
Total	36	—	4	1	60	2	4	107

<b>Lump Sum Scheme Contribution Rates (% of salary)</b>								
Age	0	1.5	3	4.5	6	7.5	9	Total
<b>Male</b>								
45 – 54	3	—	13	5	130	23	40	214
55 – 59	7	—	30	8	181	19	58	303
60 – 64	5	—	42	4	175	18	56	300
65 –	3	—	15	3	57	3	21	102
Total	18	—	100	20	543	63	175	919
<b>Female</b>								
45 – 54	5	—	51	8	176	29	66	335
55 – 59	6	—	46	17	180	23	75	347
60 – 64	1	—	49	12	176	25	69	332
65 –	2	—	34	5	89	8	35	173
Total	14	—	180	42	621	85	245	1,187

The standard rate of 6 percent shown in the tables above includes members whose standard rate is between 5 and 6 percent. Lump Sum Scheme members show more variation from the standard than Pension Scheme members. Lump Sum Scheme members have tended to increase their contribution rate to the Scheme. Most of the Pension Scheme members with zero contributions will be members whose contributions have ceased because they have attained age 60 and maximum contribution points.

The percentages at standard rates for each Scheme are as follows:

<b>Percentage Contribution at Standard Rate</b>		
	Males	Females
Pension Scheme	39	56
Lump Sum Scheme	59	52

## APPENDIX D — PENSIONER EXPERIENCE

### D.1 Introduction

The mortality experience of pensioners during the three years to 30 June 2019 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. 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.

### D.2 Age Retirement Pensioners

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

	Males	Females
Actual Deaths	841	173
Expected Deaths	843	163

The rates of mortality have shown a further decline, which is at roughly the same rate as the anticipated improvement in mortality rates in the Australian population. New rates have been based on the Australian Life Tables 2015-17 adjusted for 3 years mortality improvement, which rise from 55% at age 60 to 100% from age 95. These proportions are the same as those in 2016.

### D.3 Invalidity Pensioners

Invalidity pensioners are expected to suffer higher rates of mortality than age retirement pensioners, 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	—	—	64	—	—	12
Expected Deaths	0	0	60	0	0	16

Invalidity rates have been set for durations over two years using a similar method as in 2016. The male rates commence at 0.007 for ages to 55 and reduce as a multiple of the Australian Life Tables 2015-17 (adjusted for 3 years mortality improvement) to 1.0 times at age 90. The female rates commence at .008 for ages to 55 and reduce as a multiple to 1.0 times at age 80.

For early durations the mortality rate has been retained at 0.05 in year one and 0.02 in year two for both males and females.

**D.4 Spouse Pensioners**

The mortality experience of spouse pensioners was as follows:

	Males	Females
Actual Deaths	21	581
Expected Deaths	20	564

Rates of mortality have been set as a multiple of the Australian Life Tables 2015-17 (adjusted for 3 years mortality improvement). The multiples of the Tables have been set at 0.85 (0.70 in 2016) for ages below 65 rising to 1.0 at age 90.

**D.5 Mortality Improvement**

The 25-year mortality improvement rates for ages 40 to 75 in the Australian Life Tables 2015-17 are mostly less than those in Australian Life Tables 2010-12. The 125-year mortality improvement rates in the same age range are similar or higher.

The 125-year improvement rates are mostly less than the 25-year rates. New mortality improvement rate assumptions have been set to equal the average of the 25- and 125-year rates to be in line with changes in mortality over the longer term and consistent with the recent trend of reducing mortality improvement.

## APPENDIX E — DEMOGRAPHIC ASSUMPTIONS

**E.1 Contributor Mortality Rates**

Age	Males	Females
45	0.00068	0.00040
50	0.00096	0.00059
55	0.00143	0.00086
60	0.00215	0.00124
65	0.00317	0.00187

**E.2 Contributor Invalidation Rates**

For Lump Sum Scheme members disability income has been assumed to be 0.15% of salary, in line with recent experience.

The rates of invalidity retirement adopted are:

Age	Pension Scheme	Lump Sum Scheme
45	0.00088	0.00088
50	0.00123	0.00123
55	0.00167	—
60	—	—
65	—	—

**E.3 Contributor Resignation Rates**

Age	Teachers		Other Employees	
	Pension Scheme	Lump Sum Scheme	Pension Scheme	Lump Sum Scheme
45	0.01244	0.01781	0.02042	0.02210
50	0.01014	0.01748	0.02108	0.02600

**E.4 Preservation Proportions — Pension Scheme**

Age	Teachers and Others
Up to 45	0.80
46	0.84
47	0.88
48	0.92
49	0.96
50 and over	1.00

**E.5 Withdrawal Benefit Option Proportions — Lump Sum Scheme**

Age	Preserved	Transfer
Up to 45	0.30	0.70
46	0.30	0.70
47	0.30	0.70
48	0.30	0.70
49	0.30	0.70
50 and over	0.30	0.70

A rate of transfer of 2% per annum has been assumed for preserved members up to age 55.

**E.6 Rates of Retirement**

Age	Current Contributors				Preserved Contributors	
	Pension Scheme		Lump Sum Scheme		Pension	Lump Sum
	Teachers	Others	Teachers	Others	Scheme	Scheme
55	0.07	0.08	0.08	0.06	0.25	0.20
56	0.09	0.10	0.06	0.06	0.25	0.07
57	0.12	0.13	0.06	0.06	0.25	0.07
58	0.15	0.17	0.09	0.08	0.25	0.07
59	0.20	0.20	0.10	0.08	0.25	0.07
60	0.50	0.43	0.18	0.21	0.50	0.12
61	0.35	0.30	0.14	0.13	0.25	0.12
62	0.35	0.30	0.16	0.13	0.25	0.12
63	0.35	0.30	0.17	0.13	0.25	0.12
64	0.35	0.30	0.22	0.20	0.37	0.12
65	0.35	0.30	0.35	0.35	0.50	0.50
66	0.45	0.30	0.25	0.30	0.50	0.50
67	0.35	0.30	0.25	0.30	0.50	0.50
68	0.35	0.30	0.25	0.30	0.50	0.50
69	0.35	0.30	0.25	0.30	0.50	0.50

**E.7 Rates of Promotional Salary Increases**

Age	Teachers	Other Employees
45	0.014	0.012
50	0.010	0.010
55	0.006	0.008
60	0.003	0.006
65	0.001	0.005

**E.8 Family Statistics — Males**

Age	Percentage Married	Age of Member less Age of Spouse	No. of Dependent Children	Average Age of Dependent Children
45	80	3	2	13
50	80	3	1	15
55	80	3	—	—
60	79	3	—	—
65	78	3	—	—
70	77	3	—	—
75	75	3	—	—
80	71	3	—	—
85	64	4	—	—
90	53	6	—	—



**E.9 Family Statistics — Females**

Age	Percentage Married	Age of Member less Age of Spouse	No. of Dependent Children	Average Age of Dependent Children
45	60	-3	1	14
50	60	-3	1	15
55	59	-3	—	—
60	58	-3	—	—
65	56	-3	—	—
70	54	-2	—	—
75	49	-2	—	—
80	42	-2	—	—
85	30	-1	—	—
90	16	—	—	—

**E.10 Pensioner Mortality Rates****Pensioner Mortality**

a proportion of ALT (adjusted for mortality imp), varying from 55% up to age 60 to 100% at age 95.

**Spouse Pensioner Mortality**

a proportion of ALT (adjusted for mortality imp), varying from 85% up to age 65 to 100% at age 90.

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## Invalidity Pensioner Mortality

Males: A rate of 0.007 to age 55 reducing to 100% times ALT (adjusted for mortality imp) at age 90.

Females: A rate of 0.007 to age 55 reducing to 100% times ALT (adjusted for mortality imp) at age 70.

Age	Invalidity Pensioners					
	Age Retirements		Spouses		After 2 years	
	Males	Females	Males	Females	Males	Females
20			0.00043	0.00017	0.00700	0.00700
25			0.00050	0.00019	0.00700	0.00700
30			0.00061	0.00027	0.00700	0.00700
35			0.00080	0.00042	0.00700	0.00700
40			0.00113	0.00062	0.00700	0.00700
45	0.00107	0.00062	0.00165	0.00096	0.00700	0.00700
50	0.00150	0.00093	0.00232	0.00144	0.00700	0.00700
55	0.00224	0.00135	0.00346	0.00209	0.00700	0.00700
60	0.00338	0.00195	0.00523	0.00301	0.00993	0.00790
65	0.00535	0.00315	0.00770	0.00454	0.01370	0.00862
70	0.00923	0.00575	0.01260	0.00785	0.02044	0.00903
75	0.01711	0.01096	0.02214	0.01418	0.03242	0.01587
80	0.03357	0.02266	0.04116	0.02779	0.05381	0.03014
85	0.06900	0.04994	0.08022	0.05806	0.09242	0.06067
90	0.13478	0.10829	0.14890	0.11963	0.14890	0.11963
95	0.22146	0.20218	0.22146	0.20218	0.22146	0.20218

The mortality rate in the first year of an invalidity pension is assumed to be 5% and 2% in the second year.

**E.11 Rates of Mortality Improvement**

Age	Annual rates of decrease of age specific mortality rates	
	Males	Females
	%	%
60	1.956	1.817
70	2.139	1.880
80	1.650	1.561
90	0.671	0.673
100	0.127	0.083

**E.12 Commutation**

Pension Type	Percentage Commuted
Age	6.0
Invalid	9.0
Spouse	13.0