

Retirement System for Members of the General Assembly of the State of South Carolina (GARS)

Actuarial Valuation Report
as of July 1, 2018



December 6, 2018

Public Employee Benefit Authority
South Carolina Retirement Systems
P.O. Box 11960
Columbia, SC 29211-1960

Subject: Actuarial Valuation as of July 1, 2018

Dear Members of the Board:

This report describes the current actuarial condition of the Retirement System for Members of the General Assembly of the State of South Carolina (GARS), determines the calculated employer contribution requirement, and analyzes changes in the System's financial condition. In addition, the report provides various summaries of the data.

A separate report is issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of July 1, the first day of the plan year for GARS. This report was prepared at the request of the Board of Directors of the South Carolina Public Employee Benefit Authority (Board) and is intended for use by the Public Employee Benefit Authority (PEBA) staff and those designated or approved by the Board.

Under South Carolina State statutes, the Board must certify the employer contribution annually. This amount is determined actuarially, based on the Board's funding policy. The Board certified contribution is determined by this actuarial valuation and to become effective twelve months after the valuation date. In other words, the contribution determined by this July 1, 2018 actuarial valuation was certified to be the employer contribution amount for the fiscal year beginning July 1, 2019. If new legislation is enacted between the valuation date and the date the certified contribution becomes effective, the Board may adjust the certified contribution to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

FINANCING OBJECTIVES AND FUNDING POLICY

The principle objectives in the funding policy that is maintained by the Board include:

- Establish a contribution amount that remains relatively level over time.
- To set an amount so that the measures of the System's funding progress which include the unfunded actuarial accrued liability, funded ratio, and funding period will be maintained or improved.
- To set a contribution amount that will result in the unfunded actuarial accrued liability (UAAL) to be amortized over a period from the current valuation date that does not exceed 30 years (as of the valuation date there are 9 years remaining in the funding period).

For GARS, the Board's funding policy is to determine an employer contribution amount equal to the sum of the employer normal cost (which pays the current year's cost) and an amortization amount which will result in the UAAL to be funded by June 30, 2027.

PROGRESS TOWARD REALIZATION OF FINANCING OBJECTIVES

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. In the absence of benefit improvements, it should increase over time, until it reaches at least 100%. The funded ratio of the retirement system increased from 46.6% to 47.8% since the last actuarial valuation. This increase was primarily due to the State's contributions to finance the unfunded liability and favorable liability experience. We expect the funded ratio to improve each year as the State's contribution effort continues to finance the existing unfunded actuarial accrued liability. If the market value of assets had been used in the calculation instead of actuarial (smoothed) value of assets, the funded ratio for the System would have increased from 42.5% to 45.7%. The increase in the funded ratio on a market value basis is primarily due to the State's contributions to finance the unfunded liability and favorable liability experience.

The market value of assets earned a 7.91% return determined using the method specified by GASB 67 and reported in the financial statement of the South Carolina Retirement Systems for the year ending June 30, 2018. The 7.6% return documented in this report was determined on a dollar-weighted basis and is net of expenses and assumed mid-year cash flows. This return resulted in the market value of assets being \$99 thousand more than expected based on the 7.25% investment return assumption.

ASSUMPTIONS AND METHODS

There were no assumption changes since the prior actuarial valuation. It is our opinion that the current assumptions are internally consistent and reasonably reflect the anticipated future experience of the System. These assumptions are based on an experience study conducted as of June 30, 2015. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can, and almost certainly will, differ as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rate, and funding periods. The actuarial calculations are intended to provide information for rational decision making.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2018. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

DATA

Member data for retired, active and inactive members was supplied as of July 1, 2018, by the PEBA staff. The staff also supplied asset information as of July 1, 2018. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. GRS is not responsible for the accuracy or completeness of the information provided to us by PEBA.

CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of GARS as of July 1, 2018.

All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of South Carolina Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

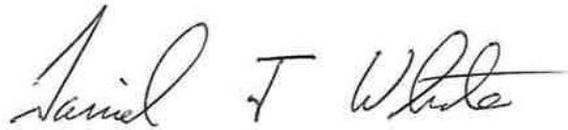
The undersigned are independent actuaries and consultants. Mr. Newton and Mr. White are Enrolled Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. Both are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.



Joseph P. Newton, FSA, MAAA, EA
Senior Consultant



Daniel J. White, FSA, MAAA, EA
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SECTION A

EXECUTIVE SUMMARY

Executive Summary

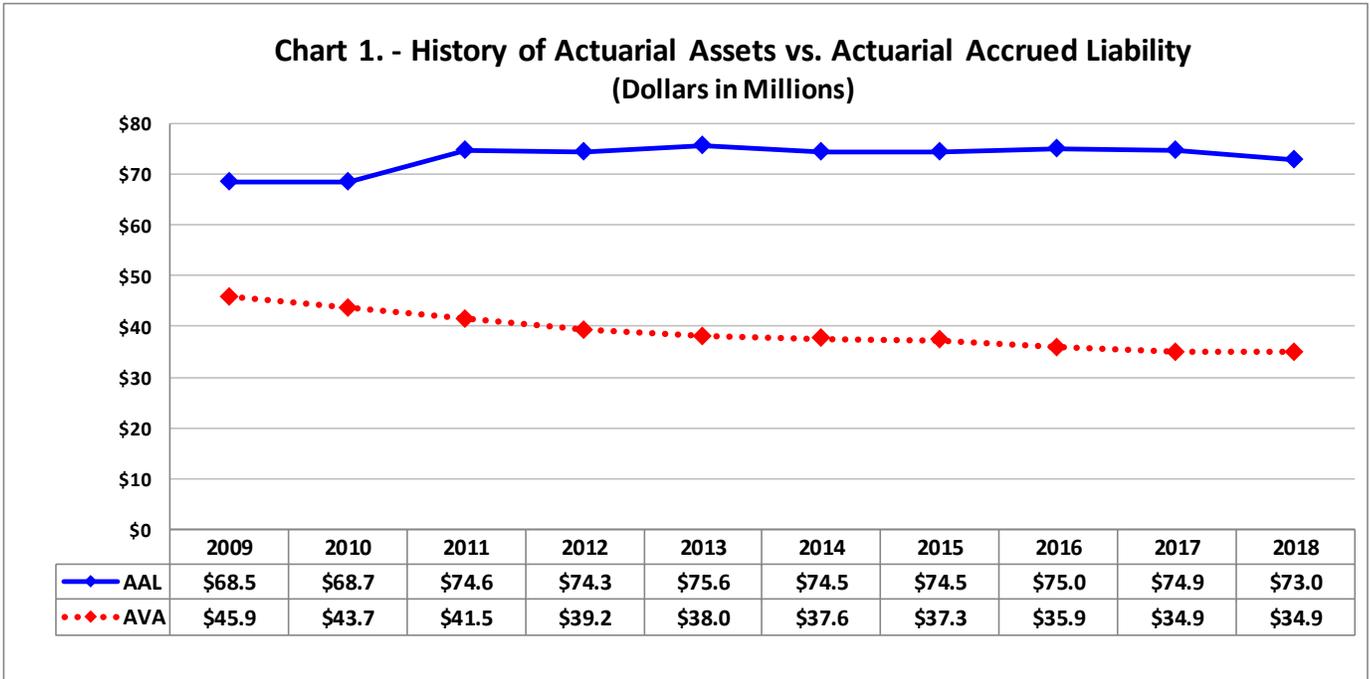
(Dollar amounts expressed in thousands)

Valuation Date:	July 1, 2018	July 1, 2017
Membership <ul style="list-style-type: none"> • Number of <ul style="list-style-type: none"> - Active positions 83 - Special contributors 17 - Retirees and beneficiaries 343 - Inactive members 37 - Total 480 • Projected payroll \$1,866 		<ul style="list-style-type: none"> 87 19 354 35 495 \$1,961
Contribution Requirement <ul style="list-style-type: none"> • Member contribution rate 11.00% • Employer contribution requirement ¹ \$6,329 		<ul style="list-style-type: none"> 11.00% \$5,804
Assets <ul style="list-style-type: none"> • Market value \$33,394 • Actuarial value 34,902 • Return on market value 7.6% • Return on actuarial value 2.3% • Ratio - actuarial value to market value 104.5% • External cash flow % -2.3% 		<ul style="list-style-type: none"> \$31,789 34,887 10.5% 1.8% 109.7% -5.5%
Actuarial Information <ul style="list-style-type: none"> • Normal cost % 23.68% • Actuarial accrued liability (AAL) \$73,004 • Unfunded actuarial accrued liability (UAAL) 38,102 • Funded ratio 47.8% • Funding period from the valuation date 9 Years 		<ul style="list-style-type: none"> 23.77% \$74,855 39,968 46.6% 10 Years
Reconciliation of UAAL <ul style="list-style-type: none"> • Beginning of Year UAAL \$39,968 - Interest on UAAL 2,898 - Amortization payment (5,421) - Assumption change 0 - Asset experience 1,715 - Liability experience (1,058) - Legislative changes 0 • End of Year UAAL 38,102 		<ul style="list-style-type: none"> \$39,070 2,930 (4,593) 1,510 1,851 (800) 0 \$39,968

¹ The contribution requirement determined by the July 1, 2018 valuation is effective for the fiscal year beginning July 1, 2019. The contribution requirement determined by the July 1, 2017 valuation was adopted by the Board to be effective for the fiscal year beginning July 1, 2018.

Executive Summary (Continued)

The unfunded actuarial accrued liability decreased by \$1.9 million since the prior year’s valuation to \$38.1 million. The single largest source of this decrease is due to the State’s contribution to finance the unfunded actuarial accrued liability. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for GARS.



There remains \$1.5 million in deferred investment losses as of the valuation date. Absent favorable investment experience to offset the existing balance of deferred investment losses, these deferred losses will be reflected in the actuarial value of assets over the next two years.

The recommended employer contribution requirement determined by the July 1, 2018 actuarial valuation increased from the prior year’s contribution requirement by \$0.525 million to \$6.329 million. Absent legislative changes or demographic or investment experience that is significantly different than assumed, we expect the recommended contribution to increase for the next two years as existing deferred investment losses become recognized in the actuarial value of assets. Also, due to level of the current contributions, we expect the funded ratio (on an actuarial value of asset basis) to increase and the dollar amount of the unfunded actuarial liability to decrease in future years.

SECTION B

DISCUSSION

Discussion

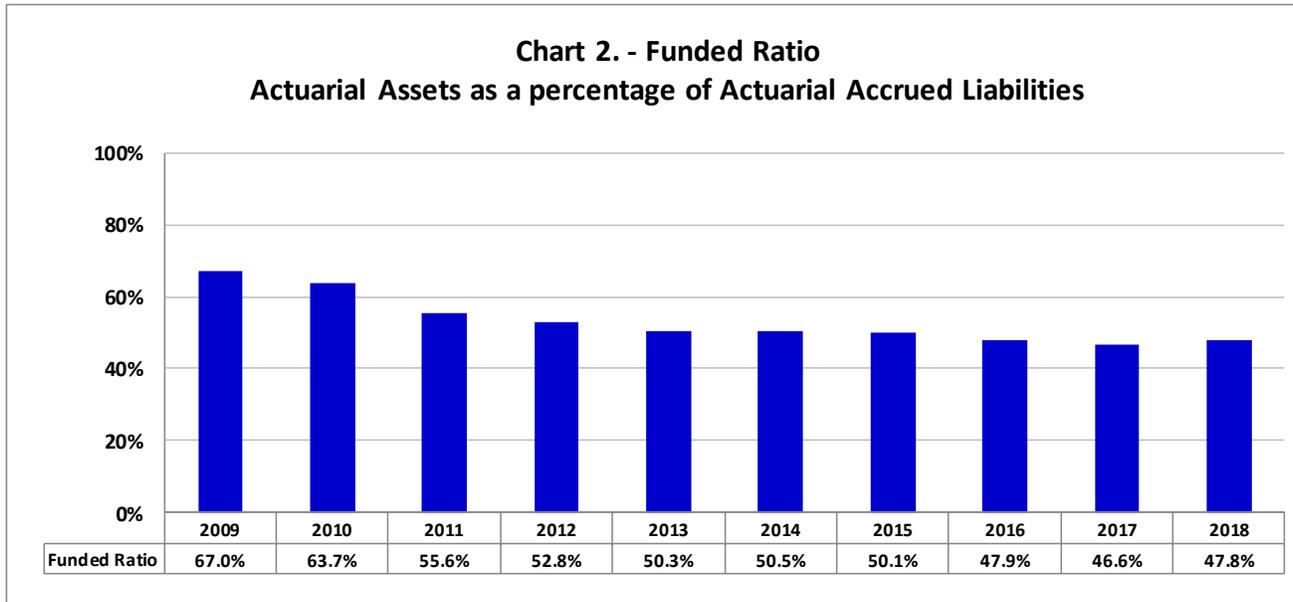
The results of the July 1, 2018 actuarial valuation of the Retirement System for Members of the General Assembly are presented in this report. The purposes of the valuation report is to depict the current financial condition of the System, determine the annual required contribution, and analyze changes in the System's financial condition. In addition, the report provides various summaries of the members participating in the plan.

This section discusses the determination of the current funding requirements and the System's funded status, as well as changes in financial condition of the retirement system. The valuation results for the prior year are shown in this report for comparison purposes.

All of the actuarial and financial tables referenced by the other sections of this report appear in Section C. Section D provides member data and statistical information. Appendices A and B provide summaries of the principle actuarial assumptions and methods and plan provisions. Finally, Appendix C provides a glossary of technical terms that are used throughout this report.

Funding Progress

The funded ratio slightly increased from 46.6% to 47.8% since the prior valuation. Table 10, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.



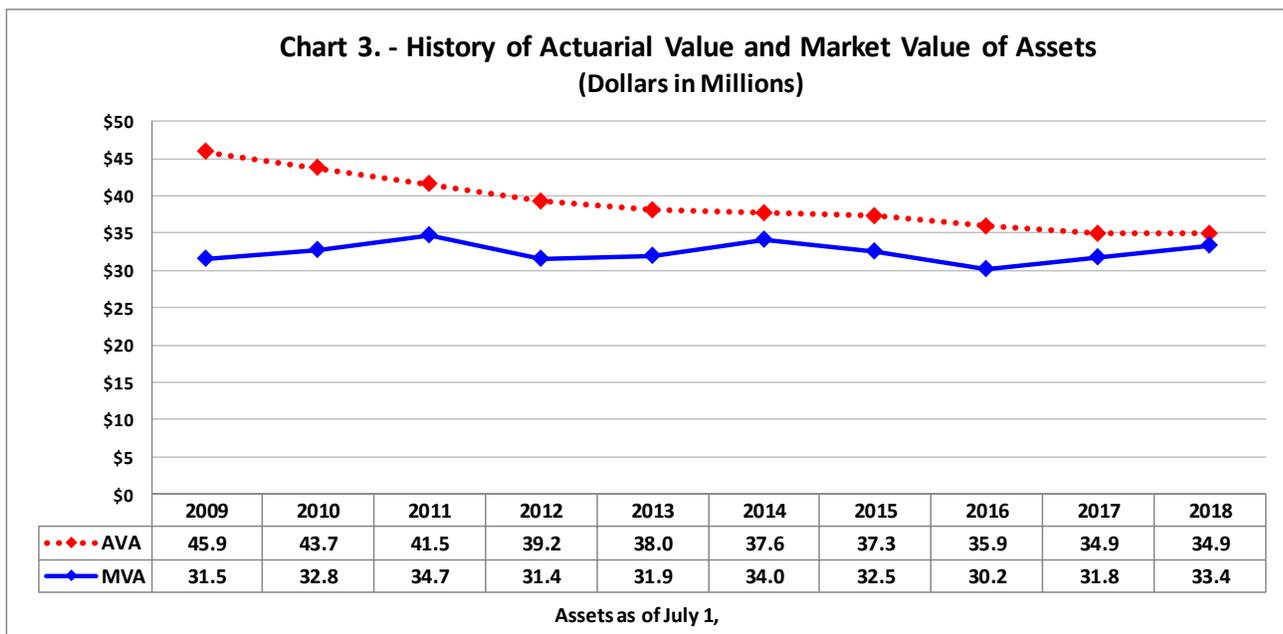
The Board's funding policy for this plan is to fully amortize the unfunded actuarial accrued liability (UAAL) by June 30, 2027. Under this funding policy, there are 9 years remaining in the funding period from the valuation date.

Asset Gains/ (Losses)

The actuarial value of assets (“AVA”) is based on a smoothed market value of assets, using a systematic approach to phase-in the difference between the actual and expected investment return on a market value of asset basis (adjusted for receipts and disbursements during the year). This is appropriate because it dampens the short-term volatility inherent in investment markets. The returns are computed net of investment expenses. The actuarial value of assets had no change and remained at \$34.9 million since the prior valuation. Table 8 in the following section of the report provides the development of the actuarial value of assets.

The rate of return on the mean market value of assets in 2018 was 7.6%; which is more than the investment return assumption. The return on an actuarial (smoothed) asset value was 2.3%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

The market value of assets is less than the actuarial value of assets, which signifies that the retirement system is in a position of deferred losses. Therefore, unless the System experiences investment returns in excess of the assumed rate of return, these deferred losses will be recognized over the next two years.



Tables 6 and 7 in the following section of this report provide asset information that was included in the annual financial statements of the System. Also, Table 9 shows the estimated yield on a market value basis and on the actuarial asset valuation method.

Actuarial Gains/ (Losses) and the Contribution Requirement

The annual actuarial valuation is a snapshot analysis of the benefit liabilities, assets and funded position of the System as of the first day of the plan year. In any one fiscal year, the experience can be better or worse from that which is assumed or expected. The actuarial assumptions do not necessarily attempt to model what the experience will be for any one given fiscal year, but instead try to model the overall experience on average over many years. The demographic experience for the last year is briefly summarized in the chart below.

The unfunded actuarial accrued liability (UAAL) has decreased from \$40.0 million in 2017 to \$38.1 million in 2018. The table below shows the source of the gains and losses and the impact of those gains and losses on the UAAL.

Reconciliation of UAAL	
(Dollars in thousands)	
• Beginning of Year UAAL	\$39,968
- Interest on UAAL	\$2,898
- Amortization payment	(5,421)
- Assumption change	0
- Asset experience	1,715
- Liability experience	(1,058)
- Legislative changes	0
- Total change	(\$1,866)
• End of Year UAAL	\$38,102

Actuarial Gains/ (Losses) and the Contribution Requirement (Continued)

The following table provides a reconciliation of the change in the recommended contribution from 2017 to 2018 valuation. The plan's investment experience, on an actuarial asset basis, had the largest single impact on the change in the recommended contribution.

Change in Recommended Employer Contribution	
(Dollars in thousands)	
• Prior year valuation	\$5,804
- Expected change	(\$111)
- Assumption change	0
- Asset experience	344
- Liability experience	292
- Legislative changes	0
- Total change	\$525
• Current year valuation	\$6,329

This funding method and contribution policy is designed to result in relatively level contribution requirements from year to year. However, absent favorable investment experience, we expect that the contribution requirement will increase over the next several years as existing deferred investment losses become fully recognized in the actuarial value of assets and calculation of the recommended contribution.

Actuarial Assumptions and Methods

In determining costs and liabilities, actuaries use assumptions about the future, such as rates of salary increase, probabilities of retirement, termination, death and disability, and an annual investment return assumption. South Carolina State Code also requires that an experience analysis that reviews the economic and demographic assumptions be performed every five years and the last experience study was conducted for the five-year period ending June 30, 2015.

There were no assumption changes since the prior actuarial valuation.

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation. It is our opinion that the assumptions are internally consistent, reasonable, and reflect anticipated future experience of the System. The next experience study will be conducted no later than June 30, 2020.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

An actuarial valuation assumes that all assumptions will be met in future years, including a 7.25% return on the actuarial value of assets determined as of the actuarial valuation date. Establishing the contribution rates, funding period, and other financial metrics on an actuarial value of asset basis is consistent with applicable actuarial standards of practice, industry prevalence, and applicable provisions in South Carolina State Code.

Emerging experience due to liabilities or investments that is different than assumed (including the recognition of previously deferred investment losses) may result in a change in the required contribution rate and or funding period that is different than expected based on the prior actuarial valuation. Also, separate projections provided outside of this report that may illustrate the financial effect of future gains or losses on actuarial basis in subsequent years may be useful for business making decisions, but such projections should not be misunderstood as documentation of satisfaction of the maximum amortization period that is specified in State Code.

Benefit Provisions

Appendix B of this report includes a summary of the benefit provisions for GARS. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

Summary of Retirement Provisions

- Membership was closed to new members after the 2012 general election.
- Earnable compensation is comprised of \$10,400 annually plus 40 times the daily rate of remuneration (i.e. \$22,400 in total earnable compensation annually). Certain line-item additional compensation for specified offices is also included. Monthly benefits are based on one-twelfth of this amount.
- The member contribution rate is 11% of earnable compensation.
- The retirement benefit amount is equal to 4.82% of the member's earnable compensation times the member's credited service (years).
- Members are eligible for retirement after they have (i) attained age 60, or (ii) completed 30 years of creditable service. Members may commence their benefit before retiring from service upon the attainment of age 70 or after accruing 30 years of service.
- Members with eight or more years of credited service that cease membership in the General Assembly may elect to continue earning future service in the system by contributing the required membership contributions (i.e. a special contributing member).

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ACTUARIAL TABLES

Actuarial Tables

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Summary of Cost Items
(Dollar amounts expressed in thousands)

	July 1, 2018	July 1, 2017
	(1)	(2)
1. Projected payroll of active members	\$ 1,866	\$ 1,961
2. Present value of future pay	\$ 9,724	\$ 10,647
3. Normal cost		
a. Total normal cost	\$ 442	\$ 466
b. Less: member contribution	(205)	(216)
c. Employer normal cost	\$ 237	\$ 250
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 16,355	\$ 16,665
b. Less: present value of future normal costs	(1,950)	(2,181)
c. Actuarial accrued liability	\$ 14,405	\$ 14,484
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	\$ 55,749	\$ 58,042
b. Inactive members	2,850	2,329
c. Active members (Item 4c)	14,405	14,484
d. Total	\$ 73,004	\$ 74,855
6. Actuarial value of assets	\$ 34,902	\$ 34,887
7. Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	\$ 38,102	\$ 39,968
8. Annual Required Contribution		
a. Employer normal cost	\$ 237	\$ 250
b. Employer contribution to amortize the UAAL	6,092	5,554
c. Total employer contribution	\$ 6,329	\$ 5,804

Actuarial Present Value of Future Benefits
(Dollar amounts expressed in thousands)

	July 1, 2018	July 1, 2017
	(1)	(2)
1. Active members		
a. Service retirement	\$ 15,740	\$ 16,012
b. Disability retirement	274	301
c. Survivors' benefits	341	352
d. Total	\$ 16,355	\$ 16,665
2. Retired members		
a. Service retirement	\$ 48,354	\$ 50,227
b. Disability retirement	0	0
c. Beneficiaries	7,272	7,691
d. Incidental death benefits	123	124
e. Total	\$ 55,749	\$ 58,042
3. Inactive members		
a. Vested terminations	\$ 2,627	\$ 2,105
b. Nonvested terminations	223	224
c. Total	\$ 2,850	\$ 2,329
4. Total actuarial present value of future benefits	\$ 74,954	\$ 77,036

Analysis of Normal Cost
(Dollar amounts expressed in thousands)

	<u>July 1, 2018</u> (1)	<u>July 1, 2017</u> (2)
1. Total normal cost rate		
a. Service retirement	21.54%	21.62%
b. Survivor benefits	0.88%	0.89%
c. Disability benefits	1.14%	1.14%
d. Total	<u>23.56%</u>	<u>23.65%</u>
2. Admin expenses	0.12%	0.12%
3. Less: member contribution rate	<u>11.00%</u>	<u>11.00%</u>
4. Net employer normal cost rate	12.68%	12.77%
5. Projected valuation payroll	\$1,866	\$1,961
6. Projected employer normal cost contribution	\$237	\$250

Results of July 1, 2018 Valuation
(Dollar amounts expressed in thousands)

	July 1, 2018
	(1)
1. Actuarial Present Value of Future Benefits	
a. Present retired members and beneficiaries	\$ 55,749
b. Present active and inactive members	19,205
c. Total actuarial present value	\$ 74,954
2. Present Value of Future Normal Contributions	
a. Employee	\$ 1,070
b. Employer	880
c. Total future normal contributions	\$ 1,950
3. Actuarial Liability	\$ 73,004
4. Current Actuarial Value of Assets	\$ 34,902
5. Unfunded Actuarial Liability	\$ 38,102
6. Unfunded Actuarial Liability Liquidation Period from the Valuation Date	9 years

Actuarial Balance Sheet
(Dollar amounts expressed in thousands)

	July 1, 2018 (1)	July 1, 2017 (2)
1. <u>Assets</u>		
a. Current Assets (Actuarial Value)		
i. Employee annuity savings fund	\$ 7,066	\$ 6,852
ii. Employer annuity accumulation fund	27,836	28,035
iii. Total current assets	\$ 34,902	\$ 34,887
b. Present Value of Future Member Contributions ¹	\$ 1,070	\$ 1,171
c. Present Value of Future Employer Contributions		
i. Normal contributions	\$ 880	\$ 1,010
ii. Accrued liability contributions	38,102	39,968
iii. Total future employer contributions	\$ 38,982	\$ 40,978
d. Total Assets	\$ 74,954	\$ 77,036
2. <u>Liabilities</u>		
a. Employee Annuity Savings Fund		
i. Past member contributions	\$ 7,066	\$ 6,852
ii. Present value of future member contributions ¹	1,070	1,171
iii. Total contributions to employee annuity savings fund	\$ 8,136	\$ 8,023
b. Employer Annuity Accumulation Fund		
i. Benefits currently in payment	\$ 55,749	\$ 58,042
ii. Benefits to be provided to other members	11,069	10,971
iii. Total benefits payable from employer annuity accumulation fund	\$ 66,818	\$ 69,013
c. Total Liabilities	\$ 74,954	\$ 77,036

¹ Includes expected contributions from special contributors.

System Net Assets
Assets at Market or Fair Value
(Dollar amounts expressed in thousands)

Item (1)	July 1, 2018 (2)	July 1, 2017 (3)
1. Cash and cash equivalents (operating cash)	\$ 5,389	\$ 4,637
2. Receivables	674	833
3. Investments		
a. Short-term securities	\$ 566	\$ 645
b. Fixed income (global)	5,104	6,306
c. Public equities (global)	10,405	9,806
d. Global tactical asset allocation	2,986	2,037
e. Alternative investments	9,170	8,823
f. Total investments	<u>\$ 28,231</u>	<u>\$ 27,617</u>
4. Securities lending cash collateral invested	\$ 33	\$ 122
5. Prepaid administrative expenses	4	4
6. Capital assets, net of accumulated depreciation	<u>6</u>	<u>7</u>
7. Total assets	\$ 34,337	\$ 33,220
8. Liabilities		
a. Due to other systems	\$ 0	\$ 0
b. Accounts payable	830	1,234
c. Investment fees payable	12	12
d. Obligations under securities lending	33	122
e. Deferred retirement benefits	0	0
f. Due to employee insurance program	0	0
g. Benefit payable	0	2
h. Other liabilities	68	61
i. Total liabilities	<u>\$ 943</u>	<u>\$ 1,431</u>
9. Total market value of assets available for benefits (Item 7. - Item 8.i.)	\$ 33,394	\$ 31,789
10. Asset allocation (investments) ¹		
a. Net invested cash	17.2%	15.2%
b. Fixed income	15.3%	19.8%
c. Public equities	31.2%	30.8%
d. Global tactical asset allocation	8.9%	6.4%
e. Alternative investments	27.4%	27.8%
f. Total investments	<u>100.0%</u>	<u>100.0%</u>

¹ These asset allocations are calculated based on the dollar amounts shown in items 1. through 9. above and, due to cash flow and rebalancing timing, may be slightly different than the allocation percentages reported by the South Carolina Retirement System Investment Commission.

Reconciliation of System Net Assets
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2018	July 1, 2017
	(1)	(2)
1. Value of Assets at Beginning of Year	\$ 31,789	\$ 30,188
2. Revenue for the Year		
a. Contributions		
i. Member contributions	\$ 287	\$ 468
ii. Employer contributions	5,428	4,539
iii. Total	\$ 5,715	\$ 5,007
b. Income		
i. Interest, dividends, and other income	\$ 649	\$ 511
ii. Investment expenses	(363)	(312)
iii. Net	\$ 286	\$ 199
c. Net realized and unrealized gains (losses)	\$ 2,090	\$ 3,130
d. Total revenue	\$ 8,091	\$ 8,336
3. Expenditures for the Year		
a. Disbursements		
i. Refunds	\$ 0	\$ 0
ii. Regular annuity benefits	6,452	6,678
iii. Other benefit payments	16	59
iv. Net transfers to other systems	0	(19)
v. Total	\$ 6,468	\$ 6,718
b. Administrative expenses and depreciation	18	17
c. Total expenditures	\$ 6,486	\$ 6,735
4. Increase in Net Assets (Item 2. - Item 3.)	\$ 1,605	\$ 1,601
5. Value of Assets at End of Year (Item 1. + Item 4.)	\$ 33,394	\$ 31,789
6. Net External Cash Flow		
a. Dollar amount	\$ (753)	\$ (1,711)
b. Percentage of market value	-2.3%	-5.5%

Estimation of Yields
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2018 (1)	July 1, 2017 (2)
1. Market Value Yield		
a. Beginning of year market assets	\$ 31,789	\$ 30,188
b. Contributions to fund during the year	5,715	5,007
c. Disbursements	(6,486)	(6,735)
d. Investment income (net of investment expenses)	<u>2,376</u>	<u>3,329</u>
e. End of year market assets	\$ 33,394	\$ 31,789
f. Estimated dollar weighted market value yield	7.6%	10.5%
2. Actuarial Value Yield		
a. Beginning of year actuarial assets	\$ 34,887	\$ 35,926
b. Contributions to fund during the year	5,715	5,007
c. Disbursements	(6,486)	(6,735)
d. Investment income (net of investment expenses)	<u>786</u>	<u>689</u>
e. End of year actuarial assets	\$ 34,902	\$ 34,887
f. Estimated actuarial value yield	2.3%	1.8%

Schedule of Funding Progress
(Dollar amounts expressed in thousands)

July 1, (1)	Actuarial Value of Assets (AVA) (2)	Actuarial Accrued Liability (AAL) (3)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2) (4)	Funded Ratio (2)/(3) (5)	Annual Covered Payroll ¹ (6)	UAAL as % of Payroll (4)/(6) (7)
2004	45,087	68,332	23,245	66.0%	3,839	605.5%
2005	46,316	69,161	22,845	67.0%	3,853	592.9%
2006	46,075	69,734	23,659	66.1%	3,854	613.9%
2007	46,925	71,014	24,089	66.1%	3,854	625.0%
2008	47,189	69,122	21,933	68.3%	3,854	569.1%
2009	45,891	68,491	22,600	67.0%	3,854	586.4%
2010	43,712	68,671	24,959	63.7%	3,854	647.6%
2011	41,484	74,604	33,120	55.6%	3,854	859.4%
2012	39,233	74,332	35,099	52.8%	3,854	910.7%
2013	38,033	75,639	37,606	50.3%	2,688	1,399.0%
2014	37,646	74,514	36,868	50.5%	2,601	1,417.5%
2015	37,312	74,509	37,197	50.1%	2,338	1,591.0%
2016	35,926	74,996	39,070	47.9%	2,316	1,686.9%
2017	34,887	74,855	39,968	46.6%	1,961	2,038.2%
2018	34,902	73,004	38,102	47.8%	1,866	2,041.9%

¹ For valuations prior to 2013 the annual covered payroll included the payroll of filled and unfilled positions.

Summary of Principle Assumptions and Methods

The information presented in the required supplementary schedules was determined as part of the actuarial valuation at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	July 1, 2018
Actuarial cost method	Entry Age Normal
Amortization method	Level dollar
Amortization period for contribution requirement	9-year closed period
Asset valuation method	5-Year Smoothed
 Actuarial assumptions:	
Investment rate of return ¹	7.25%
Projected salary increases	None
Inflation	2.25%
Cost-of-living adjustments	0.00%
Retiree mortality	2016 Public Retirees of South Carolina Mortality Table for Males and Females, projected using Scale AA from the year 2016. Male rates are multiplied by 100% and female rates are multiplied by 111%.

¹ This is a prescribed assumption in Section 9-16-335 of South Carolina State Code.

Solvency Test

(Dollar amounts expressed in thousands)

July 1,	Actuarial Accrued Liability			Valuation Assets	Portion of Aggregate Accrued Liabilities Covered by Assets		
	Active Member Contributions	Retirants & Beneficiaries	Active & Inactive Members (Employer Financed)		Active	Retirants	ER Financed
	(1)	(2)	(3)		(4)	(5)	(6)
2004	8,485	48,126	11,721	45,087	100.0%	76.1%	0.0%
2005	8,024	51,353	9,784	46,316	100.0%	74.6%	0.0%
2006	8,094	51,870	9,770	46,075	100.0%	73.2%	0.0%
2007	7,735	54,115	9,164	46,925	100.0%	72.4%	0.0%
2008	7,265	53,240	8,617	47,189	100.0%	75.0%	0.0%
2009	6,822	54,586	7,083	45,891	100.0%	71.6%	0.0%
2010	7,265	53,486	7,920	43,712	100.0%	68.1%	0.0%
2011	7,100	58,291	9,213	41,484	100.0%	59.0%	0.0%
2012	7,267	58,213	8,852	39,233	100.0%	54.9%	0.0%
2013	7,164	59,592	8,883	38,033	100.0%	51.8%	0.0%
2014	7,358	58,098	9,058	37,646	100.0%	52.1%	0.0%
2015	7,295	58,384	8,830	37,312	100.0%	51.4%	0.0%
2016	7,334	57,314	10,348	35,926	100.0%	49.9%	0.0%
2017	6,852	58,042	9,961	34,887	100.0%	48.3%	0.0%
2018	7,066	55,749	10,189	34,902	100.0%	49.9%	0.0%

SECTION D

MEMBERSHIP DATA

Membership Tables

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Summary of Membership Data

	July 1, 2018 (1)	July 1, 2017 (2)
1. Active Members		
a. Males	72	76
b. Females	11	11
c. Total members	83	87
d. Total annualized prior year pay	\$ 1,865,507	\$ 1,960,551
e. Average pay	\$ 22,476	\$ 22,535
f. Average age	57.8	56.9
g. Average service	16.0	15.1
h. Member contributions with interest	\$ 4,873,172	\$ 4,749,122
i. Average contributions with interest	\$ 58,713	\$ 54,588
2. Special Contributors		
a. Males	13	16
b. Females	4	3
c. Total members	17	19
d. Member contributions with interest	\$ 816,391	\$ 930,454
e. Average contributions with interest	48,023	48,971
3. Vested Inactive Members		
a. Number	18	15
b. Total annual deferred benefits	\$ 328,002	\$ 254,904
c. Average annual deferred benefit	\$ 18,222	\$ 16,994
4. Nonvested Inactive Members		
a. Number	19	20
b. Member contributions with interest	\$ 223,100	\$ 224,406
c. Average contributions with interest	\$ 11,742	\$ 11,220
5. Service Retirees		
a. Number	272	279
b. Total annual benefits	\$ 5,374,962	\$ 5,470,720
c. Average annual benefit	\$ 19,761	\$ 19,608
d. Average age at the valuation date	74.4	73.8
6. Disabled Retirees		
a. Number	0	0
b. Total annual benefits	\$ 0	\$ 0
c. Average annual benefit	\$ 0	\$ 0
d. Average age at the valuation date	N/A	N/A
7. Beneficiaries		
a. Number	71	75
b. Total annual benefits	\$ 980,964	\$ 1,060,790
c. Average annual benefit	\$ 13,816	\$ 14,144
d. Average age at the valuation date	74.0	74.1

Summary of Historical Active Membership

July 1, (1)	Number of Employers (2)	Active Members		Covered Payroll		Average Annual Pay		Average Age (9)	Average Service (10)
		Number ¹ (3)	Percent Increase /(Decrease) (4)	Amount in Thousands ¹ (5)	Percent Increase /(Decrease) (6)	Amount (7)	Percent Increase /(Decrease) (8)		
2004	2	170	0.0%	3,839	-0.1%	22,582	-0.1%	N/A	N/A
2005	2	170	0.0%	3,853	0.4%	22,668	0.4%	N/A	N/A
2006	2	170	0.0%	3,854	0.0%	22,671	0.0%	N/A	N/A
2007	2	170	0.0%	3,854	0.0%	22,671	0.0%	N/A	N/A
2008	2	170	0.0%	3,854	0.0%	22,671	0.0%	N/A	N/A
2009	2	170	0.0%	3,854	0.0%	22,671	0.0%	51.4	9.0
2010	2	170	0.0%	3,854	0.0%	22,671	0.0%	52.3	10.2
2011	2	170	0.0%	3,854	0.0%	22,671	0.0%	52.7	9.8
2012	2	170	0.0%	3,854	0.0%	22,671	0.0%	53.3	10.8
2013	2	119	-30.0%	2,688	-30.3%	22,588	-0.4%	53.7	11.8
2014	2	115	-3.4%	2,601	-3.2%	22,617	0.1%	54.7	12.4
2015	2	104	-9.6%	2,338	-10.1%	22,481	-0.6%	55.6	13.4
2016	2	102	-1.9%	2,316	-0.9%	22,710	1.0%	56.4	14.3
2017	2	87	-14.7%	1,961	-15.3%	22,535	-0.8%	56.9	15.1
2018	2	83	-4.6%	1,866	-4.8%	22,476	-0.3%	57.8	16.0

¹ For valuations prior to 2013 the annual covered payroll included the payroll of filled and unfilled positions.

Distribution of Active and Special Contributor Members by Age and Service

Attained Age	Years of Credited Service													Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	1	-	-	-	-	-	-	-	1
35-39	-	-	-	-	-	1	-	-	-	-	-	-	-	1
40-44	-	-	-	-	-	1	4	3	-	-	-	-	-	8
45-49	-	-	-	-	-	-	9	2	1	-	-	-	-	12
50-54	-	-	-	-	-	2	8	4	4	1	1	-	-	20
55-59	-	-	-	-	-	3	5	7	3	2	-	1	-	21
60-64	-	-	-	-	-	2	5	4	5	1	1	-	-	18
65 & Over	-	-	-	-	-	5	3	4	3	3	1	-	-	19
Total	-	-	-	-	-	15	34	24	16	7	3	1	-	100

Schedule of Annuitants by Type of Benefit

Type of Benefit/ Form of Payment (1)	Number (2)	Annual Benefits Amount (3)	Average Monthly Benefit (4)
Service :			
Maximum & QDRO	132	\$ 2,653,156	\$ 1,675
100% J&S	56	1,107,824	1,649
100% Pop-up	38	731,652	1,605
50% J&S	24	458,741	1,593
50% Pop-up	22	423,589	1,605
Subtotal:	272	\$ 5,374,962	\$ 1,647
Disability:			
Maximum	0	\$ 0	\$ 0
Beneficiaries:	71	\$ 980,964	\$ 1,151
Total:	343	\$ 6,355,926	\$ 1,544

Distribution of Annuitants by Monthly Benefit

Monthly Benefit Amount			Number of Annuitants	Female	Male	Average Service
(1)			(2)	(3)	(4)	(5)
		Under \$200	12	5	7	2.00
\$	200	- 399	13	7	6	11.00
	400	- 599	11	4	7	7.27
	600	- 799	21	7	14	13.14
	800	- 999	32	15	17	14.66
	1,000	- 1,199	30	9	21	18.50
	1,200	- 1,399	24	3	21	18.46
	1,400	- 1,599	35	11	24	20.20
	1,600	- 1,799	41	5	36	20.76
	1,800	- 1,999	43	10	33	22.53
	2,000	- 2,199	21	7	14	28.95
	2,200	- 2,399	15	3	12	27.47
	2,400	- 2,599	15	2	13	30.27
	2,600	- 2,799	12	2	10	32.92
	2,800	- 2,999	6	1	5	32.17
	3,000	- 3,199	5	1	4	31.60
	3,200	- 3,399	3	1	2	39.33
	3,400	- 3,599	0	0	0	0.00
	3,600	- 3,799	1	1	0	30.00
	3,800	- 3,999	1	0	1	31.00
	4,000	- 4,199	2	0	2	30.00
	4,200	- 4,399	0	0	0	0.00
	4,400	- 4,599	0	0	0	0.00
	4,600	- 4,799	0	0	0	0.00
	4,800	- 4,999	0	0	0	0.00
	5,000	& Over	0	0	0	0.00
Total			343	94	249	20.34

Schedule of Retirants Added to And Removed from Rolls

July 1, (1)	Added to Rolls		Removed from Rolls		Rolls End of the Year		% Increase in Annual Benefit (8)	Average Annual Benefit (9)
	Number (2)	Annual Benefits(\$000) (3)	Number (4)	Annual Benefits(\$000) (5)	Number (6)	Annual Benefits(\$000) (7)		
2004	12	185	9	119	297	5,353	1.2%	18,024
2005	22	486	7	125	312	5,716	6.8%	18,321
2006	13	238	8	179	317	5,775	1.0%	18,218
2007	18	321	2	13	333	6,083	5.3%	18,267
2008	19	337	10	134	342	6,286	3.3%	18,380
2009	26	505	15	266	353	6,525	3.8%	18,484
2010	7	148	14	261	346	6,412	-1.7%	18,532
2011	12	238	5	108	353	6,542	2.0%	18,534
2012	16	251	11	130	358	6,663	1.8%	18,611
2013	22	444	17	353	363	6,754	1.4%	18,606
2014	12	200	20	358	355	6,596	-2.3%	18,581
2015	15	262	8	193	362	6,666	1.1%	18,414
2016	7	109	11	161	358	6,614	-0.8%	18,475
2017	18	345	22	427	354	6,532	-1.2%	18,451
2018	4	55	15	231	343	6,356	-2.7%	18,530

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Methods and Assumptions

The following presents a summary of the actuarial assumptions and methods used in the valuation of the Retirement System for Members of the General Assembly of South Carolina.

Investment Rate of Return

Assumed annual rate of 7.25% net of investment and administrative expenses composed of a 2.25% inflation component and a 5.00% real rate of return, net of investment expenses.

This is a prescribed assumption in Section 9-16-335 of the South Carolina State Code.

Rates of Annual Salary Increase

No increases in salary are assumed.

Active Member Decrement Rates

- a. Assumed rates of service retirement are shown in the following table. In addition to the rates in the table below, members with 30 years of service are assumed to immediately commence their retirement benefit. Special contributors are assumed to retire at the earlier of attaining age 60 or attaining 22 years of service.

Age Based Retirement Rates	
Age	Assumed Rate
60 & Under	50.00%
61 - 64	10.00%
65 - 69	20.00%
70 & older	100.00%

- b. An abbreviated table with the assumed rates of disability and mortality while employed is shown below. There is no active employment withdrawal assumption.

Age	Disability Rates		Pre-Retirement Mortality	
	Males	Females	Males	Females
25	0.0419%	0.0458%	0.0460%	0.0164%
30	0.0629%	0.0616%	0.0429%	0.0207%
35	0.0838%	0.0616%	0.0497%	0.0272%
40	0.1572%	0.1074%	0.0597%	0.0376%
45	0.2620%	0.2200%	0.0924%	0.0624%
50	0.4192%	0.3520%	0.1602%	0.1047%
55	0.6812%	0.5720%	0.2649%	0.1589%
60	1.0480%	0.8800%	0.4454%	0.2320%
Multiplier	104.8%	88.0%	95%	95%

Note: The multiplier has been applied to the decrement in the illustrative table.

Post Retirement Mortality

- a. Healthy retirees and beneficiaries – The 2016 Public Retirees of South Carolina Mortality Table for Males and the 2016 Public Retirees of South Carolina Mortality Table for Females multiplied projected using the AA projection table from the year 2016 with multipliers based on plan experience. The following are sample rates:

Healthy Annuitant Mortality Rates Before Projection		
Age	Males	Females
50	0.2038%	0.1454%
55	0.3205%	0.2465%
60	0.5863%	0.4265%
65	1.0198%	0.5924%
70	1.5718%	0.9640%
75	2.7195%	1.8534%
80	5.0493%	3.7276%
85	9.1594%	7.0538%
90	15.9042%	12.3489%
Multiplier	100%	111%

Note: The multiplier has been applied to the decrement in the illustrative table.

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years				
Gender	Year of Retirement			
	2020	2025	2030	2035
Male	20.6	20.9	21.3	21.6
Female	22.7	22.8	23.0	23.2

- b. A separate table of mortality rates is used for disabled retirees based on the RP-2014 Disabled Mortality table projected using the AA projection table from the year 2014 and with multipliers based on plan experience. The following are sample rates of the base table:

Disabled Annuitant Mortality Rates		
Age	Males	Females
50	2.5494%	1.4884%
55	2.9211%	1.8099%
60	3.3255%	2.1249%
65	3.9606%	2.6075%
70	5.0433%	3.5254%
75	6.7859%	5.1306%
80	9.5770%	7.6295%
85	14.1629%	11.3025%
90	21.6256%	16.5815%
Multiplier	125%	125%

Note: The multiplier has been applied to the decrement in the illustrative table.

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for the five-year phase in of the actual investment return in excess of (or less than) the expected investment return on a market value of asset basis. This five-year phase in begins with the investment experience for the fiscal year ending June 30, 2016. The actual return is calculated net of investment expenses, and the expected investment return is equal to the assumed investment return rate multiplied by the prior year's market value of assets, adjusted for contributions, benefits paid, and refunds.

Actuarial Cost Method

The Entry Age Normal actuarial cost method allocates the System's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level dollar amount necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

An unfunded accrued liability exists in the amount equal to the excess of accrued liability over valuation assets. The amortization period of the System is the number of years required to fully amortize the unfunded accrued liability, on an actuarial value of asset basis, with the expected amount of employer contributions in excess of the employers' portion of the normal cost.

Note, the principle financial measurement calculations in this actuarial valuation, which include the unfunded actuarial accrued liability, funded ratio, contributions rates, and funding period, are based on an actuarial value of assets (smoothed value) basis. The actuarial value of assets is a calculated asset value which may be greater than or less than the market value of assets and is used to dampen some of the volatility in the market value of assets. As a result, many of these measures would be different if they were determined on a market value of asset basis.

Future Cost-of-living Increases

No increases are assumed.

Payroll Growth Rate

None assumed.

Other Assumptions

1. The normal cost is increased by \$15,000 to account for administrative expenses that are paid with plan assets.

Percent married: 100% of active members are assumed to be married.

2. Age difference: Males are assumed to be four years older than their spouses.
3. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.
4. Inactive Population: All non-vested members are assumed to take an immediate refund. Members with a vested benefit are assumed to elect a refund or a deferred benefit commencing at age 60, whichever is more valuable at the valuation date.
5. It is assumed there will be no recoveries once disabled.
6. Decrement timing: Decrements of all types are assumed to occur mid-year.
7. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
8. Benefit Service: All active and special contributing members are assumed to accrue one year of eligibility service each year.

Participant Data

Participant data was securely supplied in electronic text files. There were separate files for (i) active and inactive members, and (ii) members and beneficiaries receiving benefits.

The data for active members included birth date, gender, service with the current employer and total vesting service, salary, and employee contribution account balances. For retired members and beneficiaries, the data included date of birth, gender, spouse's date of birth (where applicable), amount of monthly benefit, date of retirement, and form of payment code.

Salary supplied for the current year was based on the annualized earnings for the year preceding the valuation date. Assumptions were made to correct for missing or inconsistent data. These had no material impact on the results presented.

APPENDIX B

BENEFIT PROVISIONS

Summary of Benefit Provisions for South Carolina General Assembly Retirement System (GARS)

Effective Date: January 1, 1966.

Administration: The South Carolina Public Employee Benefit Authority is responsible for the general administrative operations and day to day management of the Plan.

Type of Plan: This is a qualified governmental defined benefit retirement plan.

Eligibility: All members of the General Assembly who acquired office prior to the 2012 general election are required to participate, unless exempted by Statute. Members with eight (8) or more years of credited service that cease membership in the General Assembly may elect to continue earning future service in the system by contributing the required membership contributions (i.e. special contributing member).

Employee Contributions: Effective January 1, 2013, the active member contribution rate increased from 10% to 11% of compensation. Member contributions are credited with interest at the rate of 4.0% per annum. Retired members who are serving in office do not make employee contributions to the system.

Earnable Compensation: \$10,400 annually plus 40 times the daily rate of remuneration (i.e. \$22,400 in total earnable compensation annually). Certain line-item additional compensation for specified offices is also included.

Service Retirement:

- a. **Eligibility:** A member may retire upon the attainment of age 60 or completing 30 years of credited service, if earlier. Members may commence their benefit before retiring from service upon the attainment of age 70 or after accruing 30 years of service.
- b. **Monthly Benefit:** 4.82% of earnable compensation times credited service.
- c. **Payment Form:** Standard annuity payment

Disability Retirement:

- a. Eligibility: Members must have five or more years of credited service, unless the disability is due to performing his or her duties.
- b. Monthly Benefit: The member will receive a service retirement benefit if they become disabled after attaining the age of 60 or completed at least 35 years of credited service. Otherwise the member will receive a benefit that is equal to the larger of 1. or 2. below.
 - 1. 50% of the retirement benefit that would have been payable had he continued service to the earlier of age 60 or 35 years of credited service and his earnable compensation had remained unchanged.
 - 2. 100% of the retirement benefit based on the member's service and earnable compensation at the time of his disability.
- c. Payment Form: Standard annuity payment
- d. Death while Disabled: A disabled member is treated as a retired member for purposes of determining a death benefit.

Vesting and Refunds:

- a. Eligibility: All members who are not vested are eligible for a refund when they terminate service. Members are vested after eight (8) years of credited service. Vested members may also elect to receive a refund in lieu of the deferred termination benefit described below.
- b. Amount: The refund benefit is the accumulated value of the member's contributions plus interest credited by the fund. Members do not earn interest on their employee contribution account balance while they are inactive.

Deferred Termination Benefit:

- a. Eligibility: Member must be vested (8 years of credited service) and must elect to leave his/her contributions on deposit.
- b. Monthly Benefit: Same as the service retirement benefit, based on service and earnable compensation at termination, and commencing once the member is eligible. Note, special contributors continue to accrue benefits under the system until the earlier of 22 years of creditable service or age 60.
- c. Payment Form: Standard annuity payment
- d. Death Benefit: The beneficiary of an inactive member who dies is entitled to receive the amount of the member's accumulated contributions (with interest).

Death while an Active Member:

- a. In General: A refund of the member's accumulated contributions (with interest) is paid to the beneficiary of a deceased member.
- b. Beneficiary Annuity: If the deceased member had attained the age of 60 or had accumulated 15 or more years of creditable service, the beneficiary may elect to receive, in lieu of the accumulated contributions, a monthly benefit for life of the beneficiary.

Optional Forms of Benefit: The System permit members to elect certain optional forms of benefit at retirement. In each case the benefit amount is adjusted to be actuarially equivalent to the "Maximum Option" form. The optional forms of payment include:

- a. Maximum Option: A life annuity. Upon the member's death, any remaining member contributions and interest will be paid to the member's designated beneficiary.
- b. Option 1 (100% Joint & Survivor): A reduced annuity payable as long as either the member or his/her beneficiary is living.
- c. Option 1A (100% Joint & Survivor with a revert to Maximum Option feature): A reduced annuity payable as long as either the member or his/her beneficiary is living. In the event the member's designated beneficiary predeceases the member, then the member shall receive a retirement allowance equal to the maximum option.
- d. Option 2 (50% Joint & Survivor): A reduced annuity payable during the member's life, and continues after the member's death at 50% of the rate paid to the member for the life of the member's designated beneficiary.
- e. Option 2B (50% Joint & Survivor with a revert to Maximum Option feature): A reduced annuity payable during the member's life, and continues after the member's death at 50% of the rate paid to the member for the life of the member's designated beneficiary. In the event the member's designated beneficiary predeceases the member, then the member shall receive a retirement allowance equal to the maximum option.

Incidental Death Benefit:

- a. Active Employees: The beneficiary (or estate) of an active employee who completes at least one full year of membership service, will receive a death benefit equal to the member’s annual earnable compensation at the time of death.

The one full year membership requirement is waived for members whose death is a result of an injury arising out of and in the course of performing his duties.

- b. Post Employment: The beneficiary (or estate) of a retiree, both current and future, will receive a one-time payment upon the retiree’s death. The amount of the one-time payment is based on the retiree’s credited service.

Years of Service Credit	Death Benefit
10 or more, but less than 20	\$1,000
20 or more, but less than 30	\$2,000
30 or more	\$3,000

Postretirement Benefit Increases: Retired members and beneficiaries will receive an adjustment to their benefit equal to the same percentage increase that the General Assembly approves in earnable compensation for active GARS members.

APPENDIX C

GLOSSARY

Glossary

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or Funding Method: A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ADC.

Actuarial Gain or Actuarial Loss: A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

- a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)
- b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
- c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations that provide the financial information of the plan, such as the funded ratio, unfunded actuarial accrued liability and the ADC.

Actuarial Value of Assets or Valuation Assets: The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Actuarially Determined Contribution (ADC): The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ADC consists of the Employer Normal Cost and the Amortization Payment.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: That portion of the pension plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Closed Amortization Period: A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decremments: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: A retirement plan that is not a Defined Contribution Plan. Typically a defined benefit plan is one in which benefits are defined by a formula applied to the member's compensation and/or years of service.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA, although GASB 25 reporting requires the use of the AVA.

Funding Period or Amortization Period: The term "Funding Period" is used two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ADC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: Governmental Accounting Standards Board.

GASB 67 and GASB 68: Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting and reporting rules for public retirement systems and the employers that sponsor, participate in, or contribute to them. Statement No. 67 sets the accounting rules for the financial reporting of the retirement systems, while Statement No. 68 sets the rules for the employers that sponsor, participate in, or contribute to public retirement systems.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.