



Meeting Agenda

**Meeting Agenda | Finance, Administration, Audit and Compliance Committee |
Health Care Policy Committee | Retirement Policy Committee | Board of Directors**

Wednesday, December 2, 2020 | Via teleconference: 888 475 4499 Meeting ID 646 749 5163 ##

Finance, Administration, Audit and Compliance Committee | 9:30 a.m.

- I. Call to Order
- II. Approval of Meeting Minutes October 1, 2020
- III. Financial Statements Audit Review by the External Auditor
- IV. Internal Audit Plan Update
- V. Old Business/Director's Report
- VI. Adjournment

Health Care Policy Committee | 10:30 a.m.

- I. Call to Order
- II. Approval of Meeting Minutes October 1, 2020
- III. Approval of 2022 Initial State Health Plan (SHP) Budget Requirements
- IV. COVID-19 Effects on SHP Claims Experience and Population Health
- V. PCMH Update and Review
- VI. Old Business/Director's Report
- VII. Adjournment

LUNCH

Retirement Policy Committee | 1:00 p.m.

- I. Call to Order
- II. Approval of Meeting Minutes October 1, 2020
- III. 2020 Actuarial Valuations of the South Carolina Retirement Systems
- IV. Defined Contribution Quarterly Reports
 - i. Deferred Compensation Program Investment Performance Report
 - ii. State ORP Investment Performance Report
- V. Deferred Compensation Program Plan Summary
- VI. Old Business/Director's Report
- VII. Adjournment

Notice of public meeting

This notice is given to meet the requirements of the S.C. Freedom of Information Act and the Americans with Disabilities Act. Furthermore, this facility is accessible to individuals with disabilities, and special accommodations will be provided if requested in advance.

Board of Directors | 2:00 p.m.

- I. Call to Order
- II. Approval of Meeting October 1, 2020
- III. RSIC Investment Performance Update
- IV. Experience Study Approval
- V. Committee Reports
 - A. Finance, Administration, Audit and Compliance Committee
 - B. Health Care Policy Committee
 - I. Approval of 2022 Initial State Health Plan Budget Requirements
 - C. Retirement Policy Committee
 - I. 2020 Actuarial Valuations of the South Carolina Retirement Systems
- VI. Old Business
 - A. Director's Report
 - B. Roundtable Discussion
- VII. Executive Session for the Purpose of Discussing Contractual Matters Pursuant to S.C. Code of Laws § 30-4-70(a)(2)
- VIII. Adjournment

**PUBLIC EMPLOYEE BENEFIT AUTHORITY AGENDA ITEM
RETIREMENT POLICY COMMITTEE**

Meeting Date: December 2, 2020

1. Subject: 2020 Actuarial Valuations of the South Carolina Retirement Systems

2. Summary: PEBA's actuaries from Gabriel Roeder Smith & Company (GRS) have submitted the annual actuarial valuations of the South Carolina Retirement System (SCRS), the South Carolina Police Officers' Retirement System (PORS), the Retirement System for Judges and Solicitors of the State of South Carolina (JSRS), the Retirement System for Members of the General Assembly of the State of South Carolina (GARS), and the South Carolina National Guard Retirement System (SCNG) as of July 1, 2020.

3. What is the Committee asked to do? Recommend that the PEBA Board receive as information the actuarial valuations of SCRS, PORS, JSRS, GARS, and SCNG as of July 1, 2020, and adopt the employer contributions for JSRS, GARS, and SCNG as recommended therein.

4. Supporting Documents:

(a) List those attached:

1. GRS Presentation for the 2020 Actuarial Valuations of the South Carolina Retirement Systems
2. SCRS Actuarial Valuation Report as of July 1, 2020
3. PORS Actuarial Valuation Report as of July 1, 2020
4. JSRS Actuarial Valuation Report as of July 1, 2020
5. GARS Actuarial Valuation Report as of July 1, 2020
6. SCNG Actuarial Valuation Report as of July 1, 2020



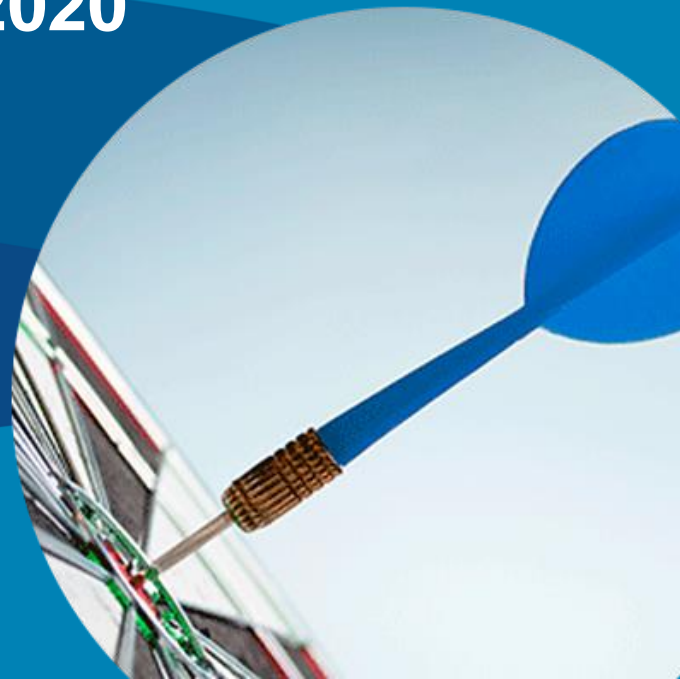
South Carolina Public Employee Benefit Authority

Actuarial Valuations as of July 1, 2020

Joe Newton, FSA, EA, MAAA

Danny White, FSA, EA, MAAA

December 2, 2020



Summary of Changes Since the Prior Valuation

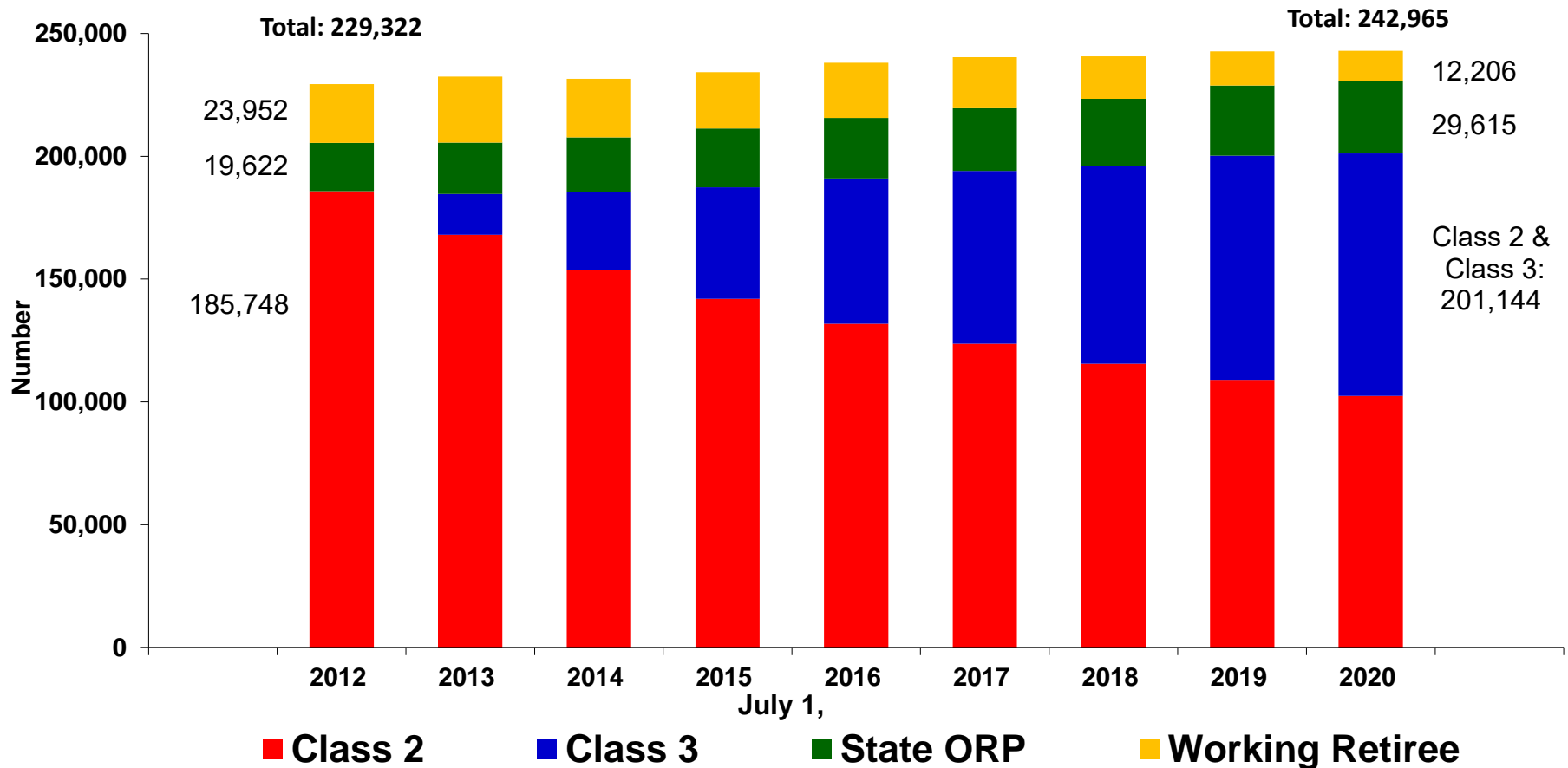
- The investment return for FY 2020 was -1.58%
 - \$2.4B less assets than expected at July 1, 2020 for SCRS
- Statutory Scheduled Employer Contribution Rates
 - Amended by Act 135 of 2020, delaying the increases 1 year
 - SCRS: 15.56% continues for FY 20/21; 16.56% effective July 1, 2021; continued increases to 18.56%
 - PORS: 18.24% continues for FY20/21; 19.24% effective July 1, 2021; continued increases to 22.24%
- No change in assumptions or methods in the July 1, 2020 actuarial valuation

Comments Regarding Act 135 of 2020

- The originally scheduled contribution rates provided some margin for adverse experience before requiring additional increases in the contribution rate
- It is important for the sustainability of the System that the contribution rate increases in statute continue without further adjustment or delay
 - These scheduled increases in contribution rates are essential to strengthen financial condition of the System prospectively

Contributing Membership - SCRS

Currently 49% of Active Members in SCRS are Class 3



Summary of July 1, 2020 Valuation Results – SCRS and PORS (\$ in millions)

Item	SCRS		PORS	
	2020	2019	2020	2019
(1)	(2)	(3)	(4)	(5)
Actuarial accrued liability	\$52,061	\$50,439	\$8,112	\$7,737
Actuarial (smoothed) value assets	<u>28,172</u>	<u>27,444</u>	<u>5,070</u>	<u>4,854</u>
Unfunded liability (UAAL)	\$23,889	\$22,995	\$3,042	\$2,885
Funded ratio	54%	54%	63%	63%
Member contribution rate	9.00%	9.00%	9.75%	9.75%
Employer contribution rate next FY	<u>16.56%</u>	<u>15.56%</u>	<u>19.24%</u>	<u>18.24%</u>
Total contribution rate	25.56%	24.56%	28.99%	27.99%
Calculated funding period (based on FY 2022 contribution rate)	20 Years	23 Years	18 Years	20 Years
Expected contributions (actual for prior year)				
Member	\$924	\$923	\$152	\$152
Employer	1,788	1,737	284	276

Summary of July 1, 2020 Valuation Results – Other Systems (\$ in Millions)

Item	JSRS		GARS		SCNG	
	2020	2019	2020	2019	2020	2019
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Actuarial accrued liability	\$415	\$400	\$71	\$72	\$67	\$67
Actuarial (smoothed) value assets	<u>177</u>	<u>167</u>	<u>37</u>	<u>35</u>	<u>33</u>	<u>31</u>
Unfunded liability (UAAL)	\$238	\$233	\$34	\$37	\$33	\$36
Funded ratio	43%	42%	52%	49%	50%	47%
Member contribution rate	10.00%	10.00%	11.0%	11.0%	\$0.0	\$0.0
Employer contribution rate	62.49%	62.49%	\$6.3	\$6.0	\$4.4	\$5.2
Amortization period	21 Years	20 Years	7 Years	8 Years	16 Years	17 Years
Expected contributions (actual for prior year)						
Member	\$3.0	\$3.0	\$0.2	\$0.2	\$0.0	\$0.0
Employer	22.0*	22.0*	6.3	6.0	4.4	5.2

*Includes \$2.9 million non-payroll based appropriation.

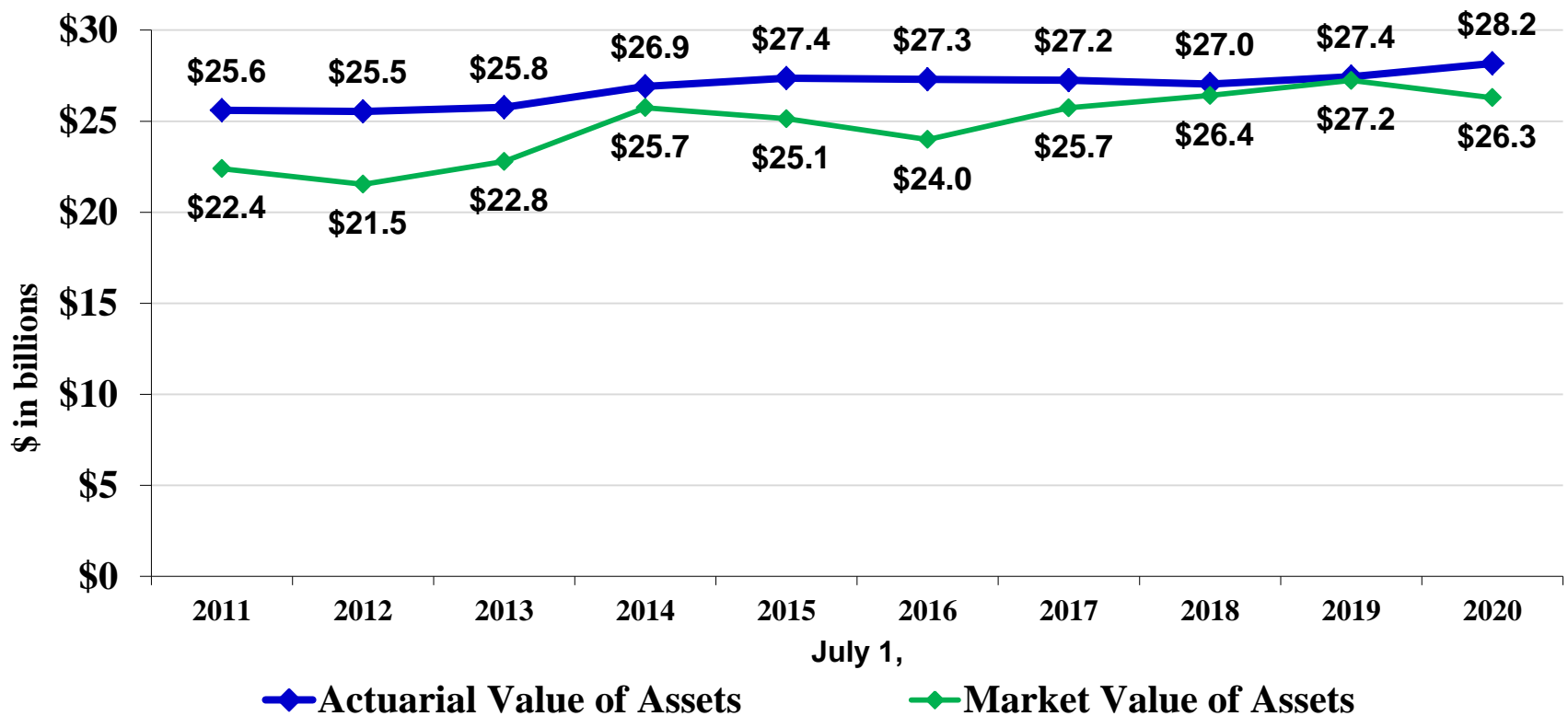


Projection Information SCRS



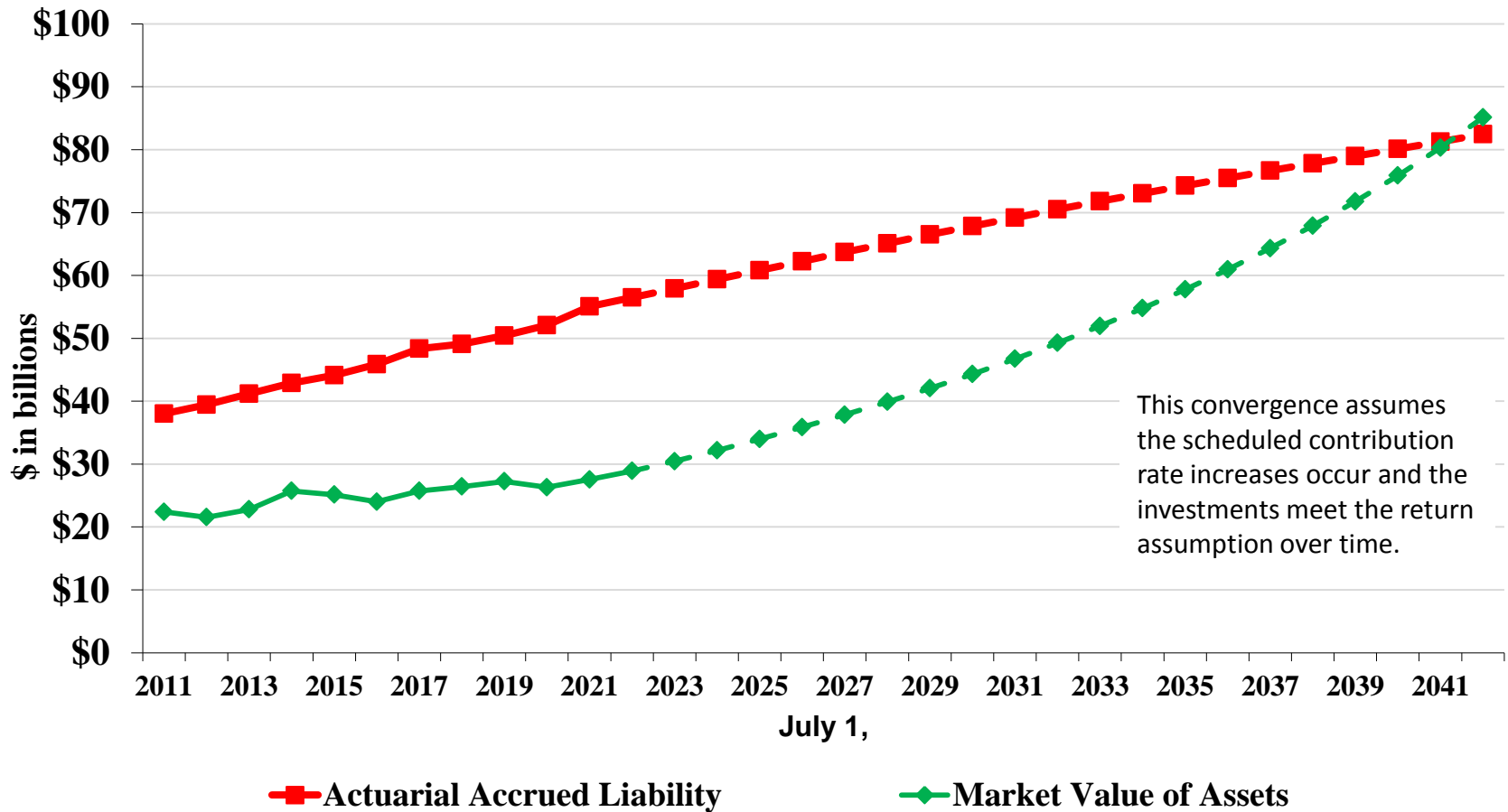
Purpose of Using an Actuarial Asset Method

Using a Calculated Actuarial Asset Value Dampens the Short-Term Investment Volatility When Determining the Actuarially Determined Contribution Requirement



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.

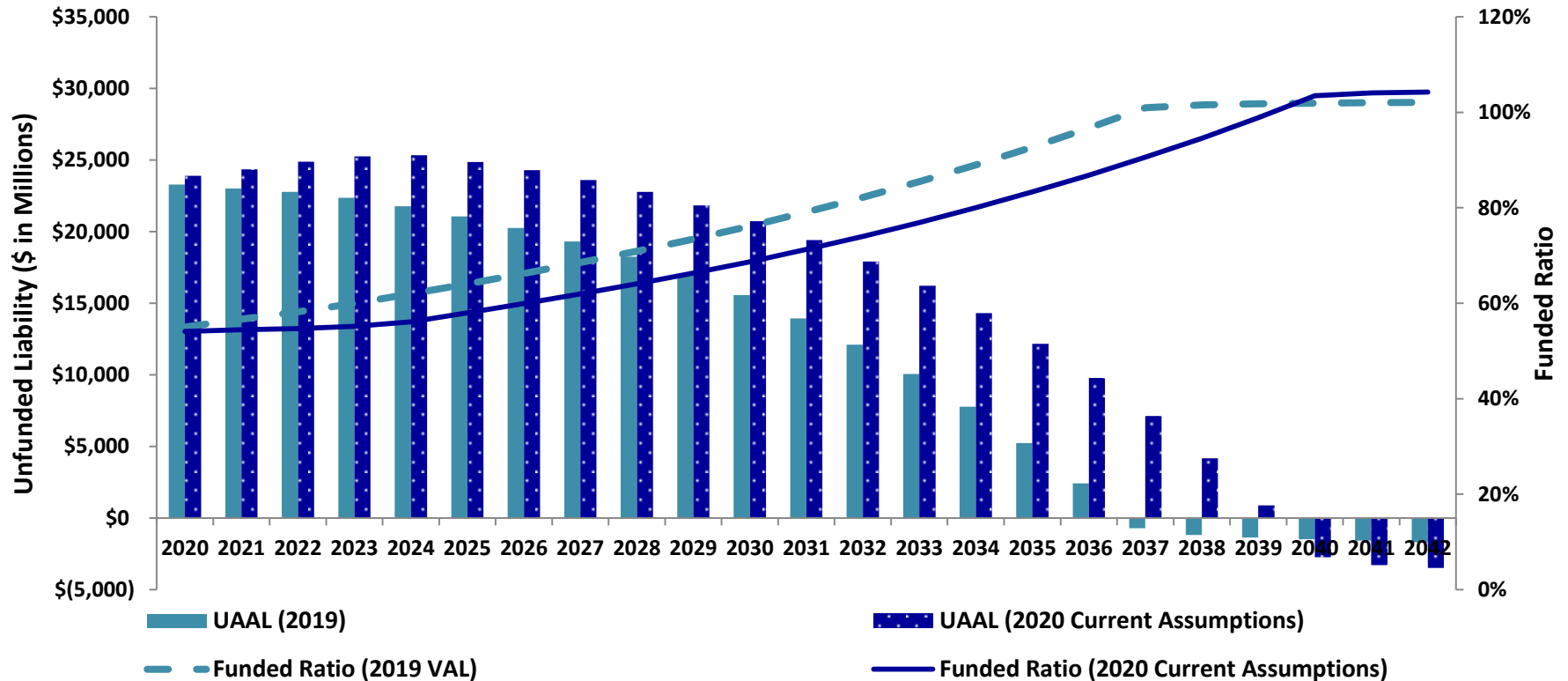
Historical and Projected Liability and Assets - SCRS



Projected information reflects all future scheduled contribution rate increases and is based on current actuarial assumptions (including a 7.25% return assumption) for 2020 and proposed assumptions starting 2021 (including a 7.00% return assumptions)

Projected Unfunded Liability – SCRS

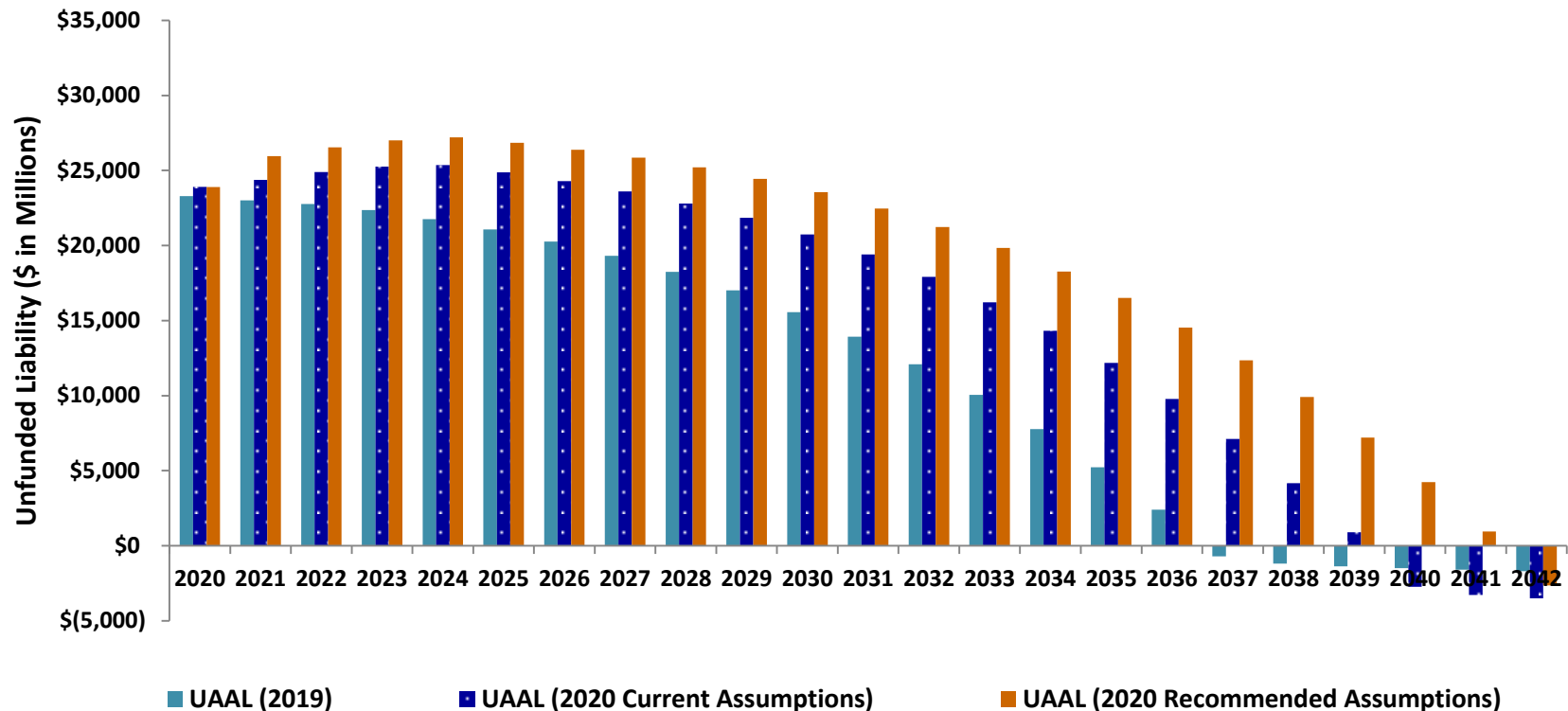
2019 Valuation Versus 2020 Valuation



The projection for 2020 reflects all future scheduled contribution rate increases and is based on current actuarial assumptions (including a 7.25% return assumption).

Projected Unfunded Liability – SCRS

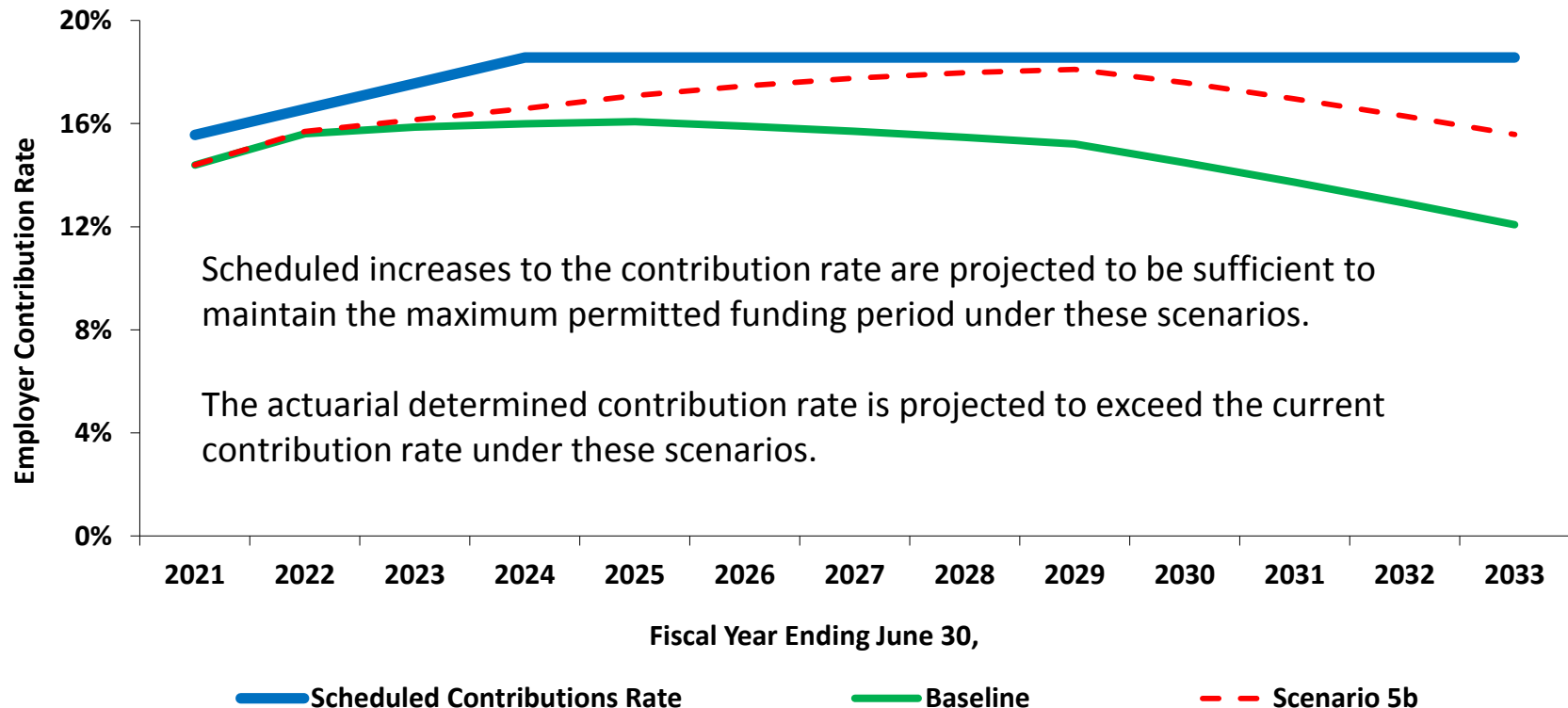
2019 Valuation Versus 2020 Valuation, including Recommended Assumptions



Projected information for 2020 reflects all future scheduled contribution rate increases and is based on current actuarial assumptions (including a 7.25% return assumption) for 2020 and recommended assumptions starting 2021 (including a 7.00% return assumption).

Projected Contribution Rates – SCRS

Legislative Decision Making (Scenario 5b)

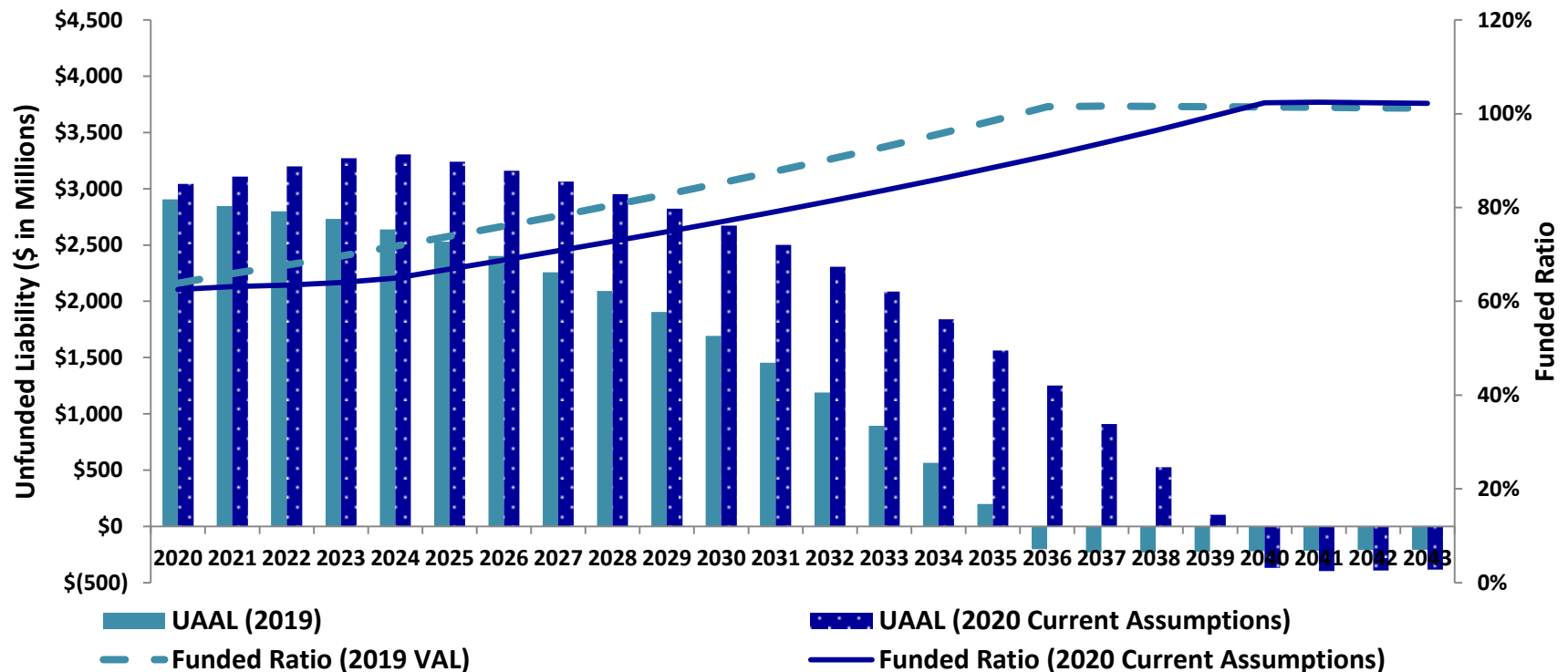


Scenario 5b: Emerging investment experience is 4.00% for each of the next five years and 7.00% each year thereafter.

Projection Information PORS



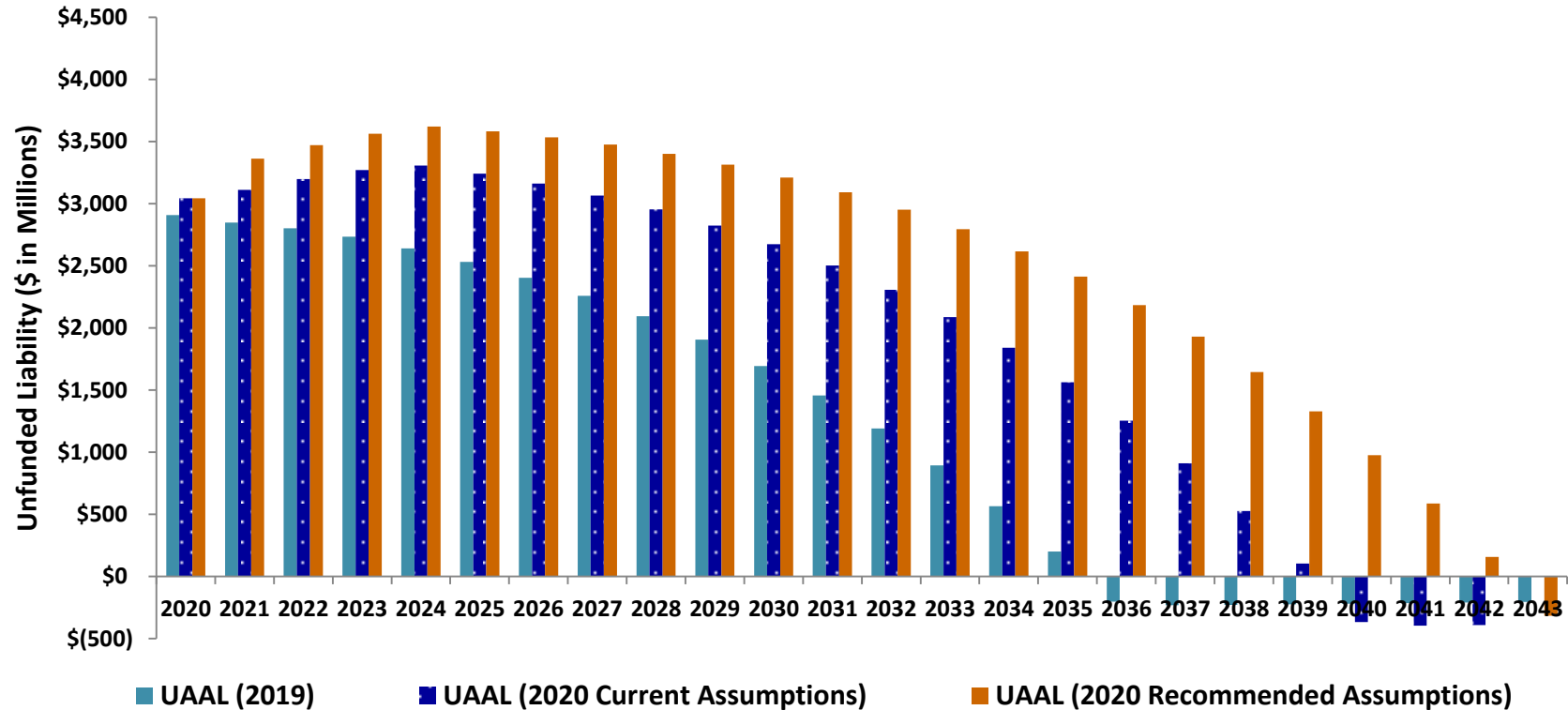
Projected Unfunded Liability – PORS 2019 Valuation Versus 2020 Valuation



Projected information for 2020 reflects all future scheduled contribution rate increases and is based on current actuarial assumptions (including a 7.25% return assumption).

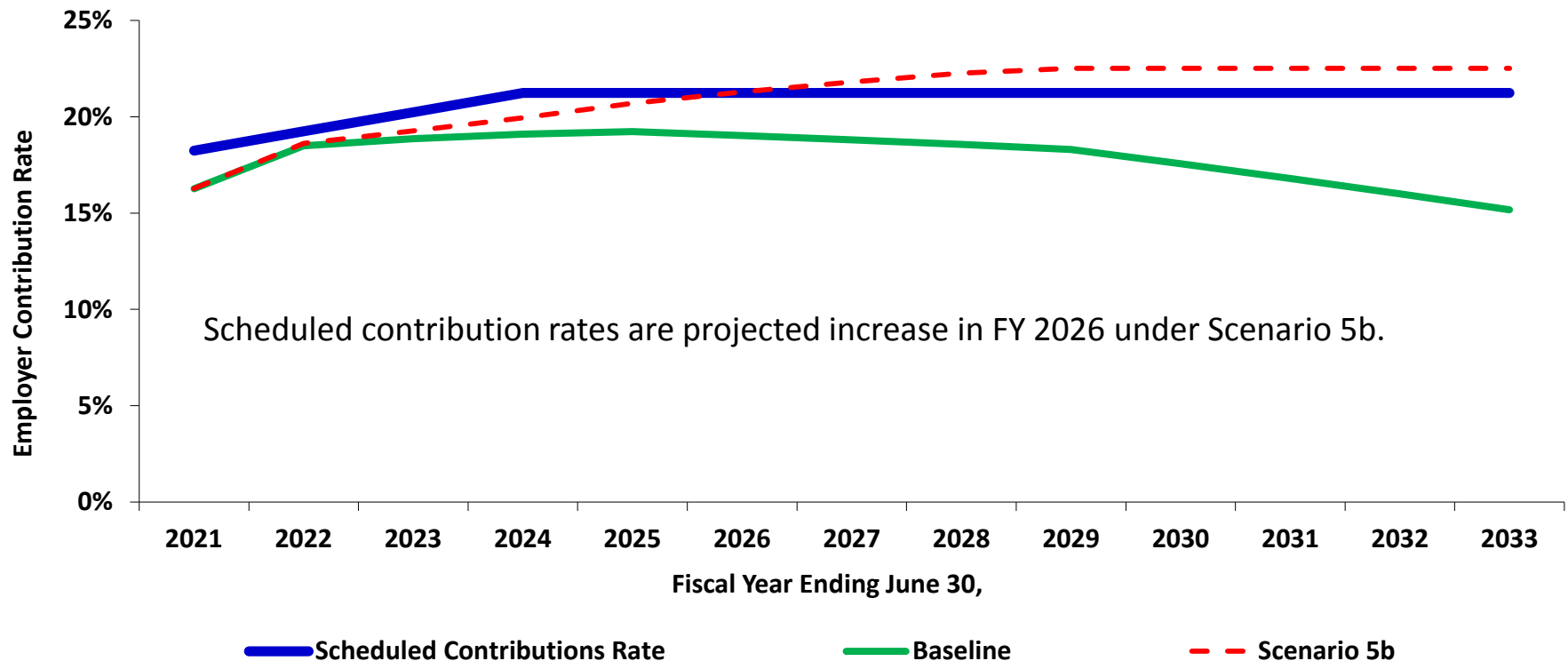
Projected Unfunded Liability – PORS

2019 Valuation Versus 2020 Valuation, including Recommended Assumptions



Projected information for 2020 reflects all future scheduled contribution rate increases and is based on current actuarial assumptions (including a 7.25% return assumption) for 2020 and recommended assumptions starting 2021 (including a 7.00% return assumptions).

Projected Contribution Rates – PORS Legislative Decision Making (Scenario 5b)



Scenario 5b: Emerging investment experience is 4% for each of the next five years and 7.00% each year thereafter.

Closing Comments

- The 2017 pension reform legislation that enacted the scheduled increase in the contribution rates through FY 2023 provided margin to weather some adverse experience
 - Projections based on the 2020 valuation continue so that the scheduled increase in the contribution rates (as amended by Act 135 in 2020) continue to be sufficient to maintain a funding period below the maximum permitted in State Code for SCRS and PORS.
 - However, there is now less margin to weather future adverse experience before requiring an increase in the contribution rate

Closing Comments (cont.)

- It is imperative the scheduled increases in contribution rates continue to occur. The System has not yet experienced decreases in the UAAL or increases in the funded ratio. The projected decline in the UAAL is contingent on the increases occurring.
- Smaller employer budgets and higher contribution rates may present a financial incentive for some participating employers to explore employment strategies that reduce their covered payroll and their required contributions to the System

Disclaimers

- This presentation is intended to be used in conjunction with the actuarial valuations as of July 1, 2020. This presentation should not be relied on for any purpose other than the purpose described in the valuation report.
- This presentation shall not be construed to provide tax advice, legal advice or investment advice.

SUMMARY OF 2020 VALUATION RESULTS

South Carolina Retirement System (SCRS)

Executive Summary

(Dollar amounts expressed in thousands)

	Valuation Date:	
	July 1, 2020	July 1, 2019
Membership		
• Number of		
- Active Members	201,144	200,264
- Retirees and Beneficiaries	146,131	144,292
- Inactive Members	198,926	191,113
- Total	546,201	535,669
• Projected payroll of active members	\$9,788,610	\$9,272,010
• Projected payroll for all members, including working retirees and members in ORP	\$11,928,366	\$11,335,475
Required Contribution Rates		
• Employer contribution rate ¹	16.56%	15.56%
• Member	9.00%	9.00%
Assets		
• Market value	\$26,292,418	\$27,238,916
• Actuarial value	28,171,964	27,443,804
• Return on market value	-1.6%	5.7%
• Return on actuarial value	4.5%	4.1%
• Ratio of actuarial to market value of assets	107.1%	100.8%
• External cash flow %	-1.9%	-2.5%
Actuarial Information		
• Normal cost %	10.63%	10.64%
• Actuarial accrued liability (AAL)	\$52,061,245	\$50,438,807
• Unfunded actuarial accrued liability (UAAL)	23,889,281	22,995,003
• Funded ratio	54.1%	54.4%
• Funding period (years) ²	20	23
Reconciliation of UAAL		
• Beginning of Year UAAL	\$22,995,003	\$22,073,826
- Interest on UAAL	1,667,138	1,600,352
- Amortization payment	(1,680,754)	(1,437,792)
- Assumption/method changes	0	0
- Asset experience	738,295	847,002
- Salary experience	177,935	(45,360)
- Other liability experience	(8,336)	(43,025)
- Legislative Changes	0	0
• End of Year UAAL	\$23,889,281	\$22,995,003

¹ The employer contribution rates in effect for FY 2020, FY 2021, and FY 2022, are 15.56%, 15.56%, and 16.56% of pay, respectively. These scheduled contribution rates were enacted by the Retirement System Funding and Administration Act of 2017, as amended by Act 135 of 2020. These contribution rates include the cost of incidental death benefits.

² The 23 year funding period shown for 2019 is based on the contribution rate schedule as modified by Act 135 of 2020. The funding period for 2020 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2022 (i.e. beginning July 1, 2021 and ending June 30, 2022).

Police Officers Retirement System (PORS)

Executive Summary

(Dollar amounts expressed in thousands)

	Valuation Date:	
	July 1, 2020	July 1, 2019
Membership		
• Number of		
- Active members	27,795	27,397
- Retirees and beneficiaries	19,625	19,094
- Inactive members	18,811	17,944
- Total	66,231	64,435
• Projected payroll of active members	\$1,440,645	\$1,378,255
• Projected payroll for all active members, including working retirees	\$1,556,669	\$1,494,540
Required Contribution Rates		
• Employer contribution rate ¹	19.24%	18.24%
• Member	9.75%	9.75%
Assets		
• Market value	\$4,730,175	\$4,815,809
• Actuarial value	5,069,748	4,852,573
• Return on market value	-1.6%	5.8%
• Return on actuarial value	4.6%	4.7%
• Ratio - actuarial value to market value	107.2%	100.8%
• External cash flow %	-0.1%	-0.3%
Actuarial Information		
• Normal cost %	14.47%	14.54%
• Actuarial accrued liability (AAL)	\$8,111,938	\$7,737,415
• Unfunded actuarial accrued liability (UAAL)	3,042,190	2,884,842
• Funded ratio	62.5%	62.7%
• Funding period (years) ²	18	20
Reconciliation of UAAL		
• Beginning of Year UAAL	\$2,884,842	\$2,723,891
- Interest on UAAL	209,151	197,482
- Amortization payment	(229,602)	(198,126)
- Assumption/method changes	0	0
- Asset experience	130,430	122,108
- Salary experience	38,748	14,408
- Other liability experience	8,621	25,079
- Legislative Changes	0	0
• End of Year UAAL	\$3,042,190	\$2,884,842

¹ The employer contribution rates in effect for FY 2020, FY 2021, and FY 2022 are 18.24%, 18.24%, and 19.24% of pay, respectively. These scheduled contribution rates was enacted by the Retirement System Funding and Administration Act of 2017, as amended by Act 135 of 2020. These contribution rates include the cost of accidental and incidental death benefits.

² The 20 year funding period shown for 2019 is based on the contribution rate schedule as modified by Act 135 of 2020. The funding period for 2020 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2022 (i.e. beginning July 1, 2021 and ending June 30, 2022).

Retirement System for Judges and Solicitors (JSRS)

Executive Summary

(Dollar amounts expressed in thousands)

Valuation Date:	July 1, 2020	July 1, 2019
Membership		
• Number of		
- Active members ¹	160	160
- Retirees and beneficiaries	205	197
- Inactive members	4	6
- Total	369	363
• Projected payroll of active members	\$30,346	\$30,346
Contribution Rates		
• Employer contribution rate	62.94% ²	62.94%
• Non-Payroll based State appropriations	\$2,900	\$2,900
• Member	10.00%	10.00%
Assets		
• Market value	\$165,250	\$165,843
• Actuarial value	176,649	167,119
• Return on market value	-1.4%	5.8%
• Return on actuarial value	4.6%	4.4%
• Ratio of actuarial to market value of assets	106.9%	100.8%
• External cash flow %	1.1%	-2.0%
Actuarial Information		
• Normal cost %	28.85%	29.51%
• Actuarial accrued liability (AAL)	\$415,069	\$399,746
• Unfunded actuarial accrued liability (UAAL)	238,420	232,627
• Funded ratio	42.6%	41.8%
• Calculated funding period (years)	21	20
Reconciliation of UAAL		
• Beginning of Year UAAL	\$232,627	\$130,457
- Interest on UAAL	16,866	9,458
- Amortization payment	(19,766)	(9,032)
- Assumption/method changes	0	0
- Asset experience	4,418	4,584
- Benefit adjustment	(7,540)	64,361
- Salary experience	(553)	25,686
- Other liability experience	12,368	7,113
- Legislative Changes	0	0
• End of Year UAAL	\$238,420	\$232,627

¹ Active member counts include 18 and 21 retired-in-place members as of July 1, 2020 and July 1, 2019, respectively and also includes unfilled positions.

² The 62.94% contribution rate includes the cost of incidental death benefits.

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

Executive Summary

(Dollar amounts expressed in thousands)

Valuation Date:	July 1, 2020	July 1, 2019
Membership <ul style="list-style-type: none"> Number of <ul style="list-style-type: none"> - Active positions 69 - Special contributors 18 - Retirees and beneficiaries 338 - Inactive members 35 - Total 460 Projected payroll \$1,570 		
Contribution Requirement <ul style="list-style-type: none"> Member contribution rate 11.00% Employer contribution requirement ¹ \$6,279 		
Assets <ul style="list-style-type: none"> Market value \$34,454 Actuarial value 36,869 Return on market value -1.3% Return on actuarial value 4.4% Ratio - actuarial value to market value 107.0% External cash flow % 0.6% 		
Actuarial Information <ul style="list-style-type: none"> Normal cost % 23.26% Actuarial accrued liability (AAL) \$71,426 Unfunded actuarial accrued liability (UAAL) 34,557 Funded ratio 51.6% Funding period from the valuation date 7 Years 		
Reconciliation of UAAL <ul style="list-style-type: none"> Beginning of Year UAAL \$36,915 - Interest on UAAL 2,235 - Amortization payment (6,092) - Assumption change 0 - Asset experience 1,010 - Liability experience 489 - Legislative changes 0 End of Year UAAL \$34,557 		

¹ The contribution requirement determined by the July 1, 2020 valuation is effective for the fiscal year beginning July 1, 2021. The contribution requirement determined by the July 1, 2019 valuation was adopted by the Board to be effective for the fiscal year beginning July 1, 2020.

South Carolina National Guard Supplemental Retirement Plan (SCNG)

Executive Summary

(Dollar amounts expressed in thousands)

Valuation Date:	July 1, 2020	July 1, 2019
Membership <ul style="list-style-type: none"> Number of <ul style="list-style-type: none"> - Active Members - Retirees - Inactive Members - Total 	12,099 4,981 1,739 <hr/> 18,819	12,100 4,923 1,823 <hr/> 18,846
Annual Required Contribution <ul style="list-style-type: none"> Member Employer contribution¹ 	\$0 \$4,405	\$0 \$5,188
Assets <ul style="list-style-type: none"> Market value Actuarial value Return on market value Return on actuarial value Ratio - actuarial value to market value External cash flow % 	\$31,092 33,299 -1.1% 4.5% 107.1% 2.5%	\$30,683 31,122 5.6% 3.8% 101.4% 2.6%
Actuarial Information <ul style="list-style-type: none"> Normal cost Actuarial accrued liability (AAL) Unfunded actuarial accrued liability (UAAL) Funded ratio Amortization period² 	\$821 66,597 33,298 50.0% 16	\$820 66,523 35,401 46.8% 17
Reconciliation of UAAL <ul style="list-style-type: none"> Beginning of Year UAAL - Interest on UAAL - Amortization payment - Assumption/method changes - Asset experience - Other liability experience - Legislative changes End of Year UAAL 	\$35,401 2,567 (4,633) 0 868 (905) 0 <hr/> 33,298	\$36,946 2,679 (4,652) 0 1,011 (583) 0 <hr/> \$35,401

¹ The contribution amount determined by the actuarial valuation is effective for the following fiscal year. The calculated contribution amount for FY 2020 was \$5,188 thousand, however the state appropriations were \$5,290 thousand.

² As of July 1, 2020, there is one year remaining in the amortization of the unfunded liability attributable to the 2006 legislation change and 16 years remaining in the amortization of the unfunded liability due to other plan experience.

South Carolina Retirement System (SCRS)

ACTUARIAL VALUATION REPORT
AS OF July 1, 2020





November 24, 2020

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

Subject: Actuarial Valuation as of July 1, 2020

Dear Members of the Board:

This report describes the current actuarial condition of the South Carolina Retirement System (SCRS), determines the unfunded liability and the calculated funding period based on the scheduled employer and member contribution rates, as well as 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 SCRS. 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.

FINANCING OBJECTIVES AND FUNDING POLICY

The employer contribution rate is established in accordance with Section 9-1-1085 of the South Carolina Code, as amended by the Retirement System Funding and Administration Act of 2017 and last modified by Act 135 of 2020. The employer contribution rate in effect for the fiscal year ending June 30, 2021 is 15.56% and is scheduled to increase by 1.00% of pay for each of the next three fiscal years until an ultimate employer contribution rate of 18.56% of pay is attained for fiscal year 2024.

Additionally, the Statute specifies that the maximum amortization period is 27 years as of July 1, 2020 and the maximum amortization period will decrease by one year in each of the next seven years until reaching a maximum 20-year funding period on July 1, 2027. The employer contribution rate determined by an actuarial valuation must be sufficient to maintain an amortization period that does not exceed 20 years each year thereafter. Finally, the Board is not permitted to decrease the employer and member contribution rates until the funded ratio of the plan is at least 85%.

If new legislation is enacted between the valuation date and the date the contribution rate becomes effective, the Board may adjust the calculated rate before certifying them, in order to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

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 System decreased from 54.4% to 54.1%. Absent unfavorable investment or liability experience, and assuming the increases in contribution rates continue as currently scheduled, it is currently projected that the funded ratio will gradually improve.

If the market value of assets had been used in the calculation instead of the actuarial (smoothed) value of assets, the funded ratio for the System would have been 50.5%, compared to 54.0% in the prior year. The decrease in the funded ratio on a market value basis is primarily due to unfavorable investment experience during the last fiscal year. Plan assets earned a -1.58% return on a time weighted-basis (net of fees) as reported in the financial statement of the South Carolina Retirement Systems for the year ending June 30, 2020. The -1.6% return documented in this report was determined on a dollar-weighted basis and assumes mid-year cash flows.

ASSUMPTIONS AND METHODS

There were no assumption changes since the prior actuarial valuation. These assumptions are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 analysis, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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.

This report was prepared using our proprietary valuation model and related software, which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2020. There were no legislative changes enacted since the prior valuation that changed or modified the benefits that members earn or receive.



DATA

Member data for retired, active and inactive members was supplied as of July 1, 2020, by the PEBA staff. The staff also supplied asset information as of July 1, 2020. 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.

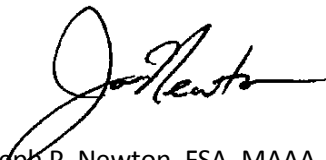
CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of SCRS as of July 1, 2020.

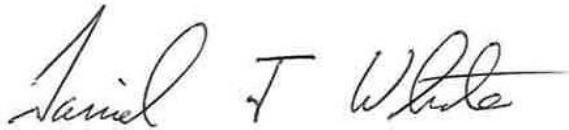
All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of South Carolina Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. All three are also Enrolled Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. Each are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.



Joseph P. Newton, FSA, MAAA, EA
Pension Market Leader and Actuary



Daniel J. White, FSA, MAAA, EA
Senior Consultant



Thomas Lyle, FSA, MAAA, EA
Consultant



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SECTION A

EXECUTIVE SUMMARY

Executive Summary

(Dollar amounts expressed in thousands)

	Valuation Date:	
	July 1, 2020	July 1, 2019
Membership <ul style="list-style-type: none"> • Number of <ul style="list-style-type: none"> - Active Members 201,144 - Retirees and Beneficiaries 146,131 - Inactive Members 198,926 - Total 546,201 • Projected payroll of active members \$9,788,610 • Projected payroll for all members, including working retirees and members in ORP \$11,928,366 		200,264 144,292 191,113 535,669 \$9,272,010 \$11,335,475
Required Contribution Rates <ul style="list-style-type: none"> • Employer contribution rate¹ 16.56% • Member 9.00% 		15.56% 9.00%
Assets <ul style="list-style-type: none"> • Market value \$26,292,418 • Actuarial value 28,171,964 • Return on market value -1.6% • Return on actuarial value 4.5% • Ratio of actuarial to market value of assets 107.1% • External cash flow % -1.9% 		\$27,238,916 27,443,804 5.7% 4.1% 100.8% -2.5%
Actuarial Information <ul style="list-style-type: none"> • Normal cost % 10.63% • Actuarial accrued liability (AAL) \$52,061,245 • Unfunded actuarial accrued liability (UAAL) 23,889,281 • Funded ratio 54.1% • Funding period (years)² 20 		10.64% \$50,438,807 22,995,003 54.4% 23
Reconciliation of UAAL <ul style="list-style-type: none"> • Beginning of Year UAAL \$22,995,003 - Interest on UAAL 1,667,138 - Amortization payment (1,680,754) - Assumption/method changes 0 - Asset experience 738,295 - Salary experience 177,935 - Other liability experience (8,336) - Legislative Changes 0 • End of Year UAAL \$23,889,281 		\$22,073,826 1,600,352 (1,437,792) 0 847,002 (45,360) (43,025) 0 \$22,995,003

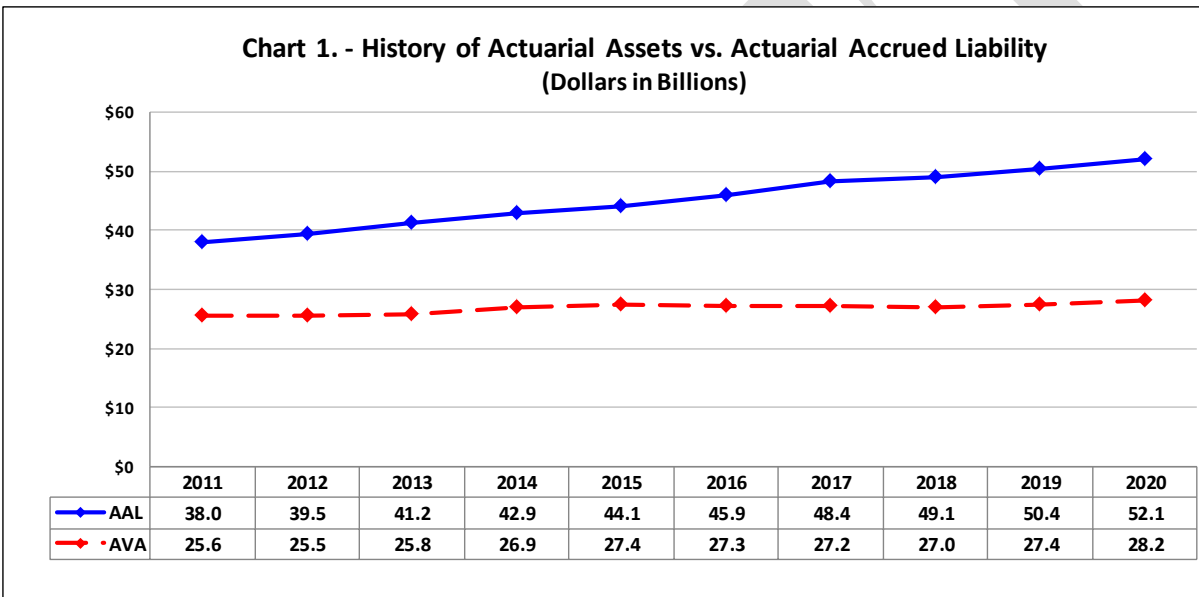
¹ The employer contribution rates in effect for FY 2020, FY 2021, and FY 2022, are 15.56%, 15.56%, and 16.56% of pay, respectively. These scheduled contribution rates was enacted by the Retirement System Funding and Administration Act of 2017, as amended by Act 135 of 2020. These contribution rates include the cost of incidental death benefits.

² The 23 year funding period shown for 2019 is based on the contribution rate schedule as modified by Act 135 of 2020. The funding period for 2020 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2022 (i.e. beginning July 1, 2021 and ending June 30, 2022).

Executive Summary (Continued)

The unfunded actuarial accrued liability increased by \$0.894 billion since the prior year's valuation to \$23.889 billion. The largest source of this increase is the \$0.738 billion increase due to recognition of deferred investment losses in the actuarial value of assets that were experienced in prior fiscal years. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for SCRS

The divergence in the assets and liabilities over the last 10 years has been due to a combination of: (i) the actual investment experience being less than the System's expected investment return assumption, (ii) assumption changes that occurred in 2011, 2016, and 2017, and (iii) contributions that were less than the interest on the unfunded actuarial accrued liability.



The employer contribution rate is scheduled to increase from 15.56% of pay in fiscal year 2021 to 16.56% of pay in fiscal year 2022. State Statutes also specify that the employer contribution rate will increase by 1.00% for each of the next two subsequent fiscal years until attaining 18.56% of pay for fiscal year 2024. These scheduled increases in the employer contribution rate and the maximum amortization that is specified in state statute will, in time, result in improved financial security of the System.

To further strengthen the financial security of the plan in the event of adverse experience, State Statutes specify that the maximum amortization period is 27 years as of July 1, 2020 and the maximum amortization period will decrease by one year in each of the next seven years until reaching a 20-year funding period on July 1, 2027. Finally, the Board is not permitted to decrease the employer and member contribution rates until the funded ratio of the plan is at least 85%.

SECTION B

DISCUSSION

Discussion

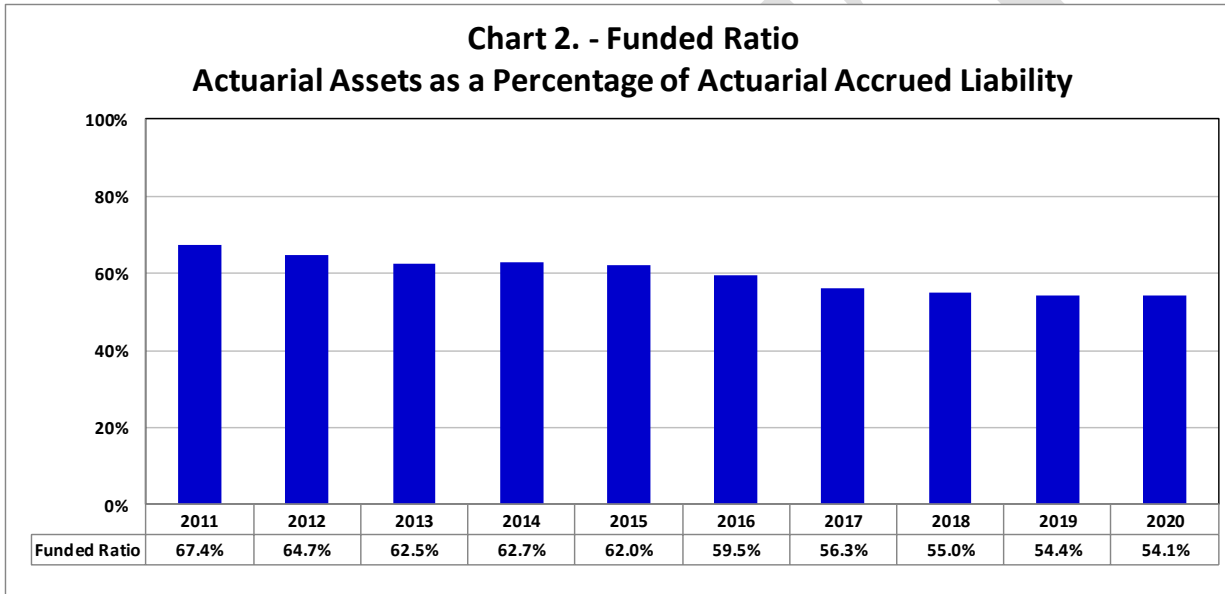
The results of the July 1, 2020 actuarial valuation of the South Carolina Retirement System are presented in this report. The primary purposes of the valuation report are to depict the current financial condition of the System and analyze changes in the System's financial condition. In addition, the report provides various summaries of the data.

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.

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. Section E provides an assessment and disclosure of risk as required by Actuarial Standards of Practice No. 51. 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 decreased from 54.4% to 54.1% since the prior valuation. Chart 2, shown below provides a 10-year history of the System's funded ratio. The gradual decline in the funded ratio over the last 10 years has been due to a combination of: (i) the actual investment experience being less than the System's expected investment return assumption, (ii) assumption changes that occurred in 2011, 2016, and 2017, and (iii) contributions that were less than the interest on the unfunded actuarial accrued liability. Table 10, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.

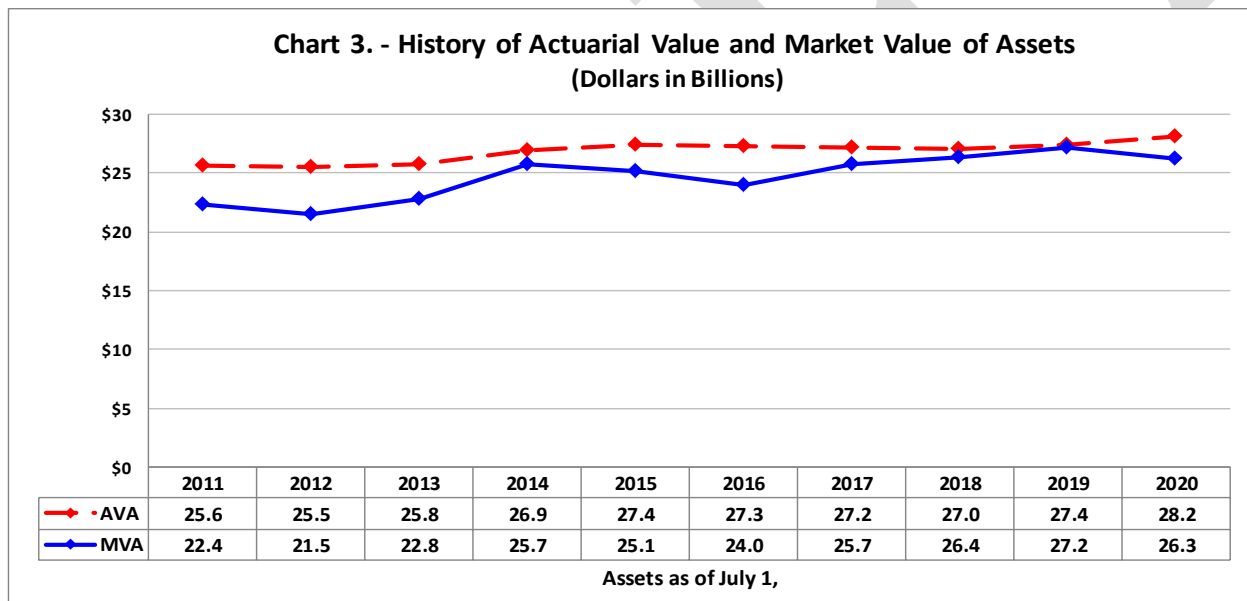


Absent future unfavorable investment or demographic experience, or legislative changes, we expect the funded ratio to remain relatively unchanged for the next year or two, and then begin to gradually improve. Also, we expect the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, to gradually increase for the next three to four years before beginning to decrease.

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 the market value of assets (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 increased to \$28.2 billion 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 market value of assets on a dollar-weighted basis for fiscal year 2020 was -1.6%; which is less than the 7.25% expected annual return. The return on an actuarial (smoothed) asset value was 4.5%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method, meaning losses on market assets from previous years were initially deferred and ultimately recognized in this fiscal year, which in turn lowered the realized return on the smoothed asset value.



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 Funding Period

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 over many years. Therefore, as long as the actual experience of the Retirement System is reasonably close to the current assumptions, the long-term funding requirements of the System will remain relatively consistent.

The unfunded actuarial accrued liability (UAAL) has increased from \$23.0 billion on July 1, 2019 to \$23.9 billion on July 1, 2020. 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 Fiscal Year UAAL	\$22,995,003
- Interest on UAAL	1,667,138
- Amortization payment	(1,680,754)
- Assumption/method changes	0
- Asset Experience	738,295
- Salary Experience	177,935
- Other liability experience	(8,336)
- Legislative changes	0
• End of Fiscal Year UAAL	<u>\$23,889,281</u>

Actuarial Gains/ (Losses) and the Funding Period (Continued)

The following table reconciles the change in the funding period from the prior year's valuation based on the contribution rates that are currently in effect for fiscal year 2021 as well as the effect of the contribution rate increase that is scheduled for fiscal year 2022.

Change in Funding Period (Years)	
• 2019 Valuation and FY 2021 Contribution Rate ¹	23.1
- Expected experience	(1.0)
- Assumption and method changes	0.0
- Asset experience	1.1
- Salary and demographic experience ²	(0.6)
- Legislative changes	0.0
- Total Change	(0.5)
• 2020 Valuation and FY 2021 Contribution Rates	22.6
- Scheduled contribution rate increase in FY 2022	(2.3)
• 2020 Valuation and Scheduled FY 2022 Contribution Rate	20.3

¹ The funding period based on the 2019 valuation is based on the contribution rate schedule that was modified by Act 135 of 2020.

² The effect of the larger than expected increase in total payroll (including ORP and working retirees) resulted in a net decrease in the funding period.

The employer contribution rate is established in accordance with Section 9-1-1085 of the South Carolina Code, as amended by the Retirement System Funding and Administration Act of 2017 as last amended by Act 135 of 2020. The employer contribution rate scheduled to be in effect for the fiscal year ending June 30, 2022 is 16.56%. The employer contribution rate is also scheduled to increase by 1.00% of pay for each of the next two fiscal years after 2022 until an ultimate employer contribution rate of 18.56% of pay is attained for fiscal year 2024.

The calculated funding period documented in this actuarial valuation only reflects the scheduled 16.56% employer contribution that is to become effective for the 2022 fiscal year (i.e. the fiscal year beginning July 1, 2021 and ending July 1, 2022).

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. There were no assumption changes since the prior actuarial valuation. These assumptions are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation.

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 SCRS. There were no legislative changes enacted since the prior actuarial valuation that changed or modified the benefits that members earn or receive. Below is a summary of the retirement provisions for Class Two members- members hired prior to July 1, 2012, and Class Three members- members hired after June 30, 2012.

Summary of Retirement Provisions for:

Class Two Members (members hired prior to July 1, 2012)

- Average Final Compensation (AFC) is based on the highest 12 consecutive quarters of compensation. The determination of a member's AFC also includes up to 45 days of unused annual leave paid at termination. Monthly benefits are based on one-twelfth of this amount.
- The retirement benefit amount is equal to 1.82% of the member's AFC times the member's credited service (years). Credited service may include up to 90 days of unused sick leave.
- Members are eligible to commence a normal retirement benefit after they have (i) 28 years of credited service or (ii) attained age 65 with 5 years of earned service.
- At each July 1 after their first full year of retirement, annuitants will receive a benefit adjustment equal to the lesser of 1.00% of their retirement benefit or \$500 per annum.

Class Three Members (members hired after June 30, 2012)

- Average Final Compensation (AFC) is based on the highest twenty (20) consecutive quarters of compensation. The determination of a member's AFC will not include unused annual leave paid at termination. Monthly benefits are based on one-twelfth of this amount;
- The retirement benefit is equal to 1.82% of the member's AFC times the member's credited service (years). Credited service will not include unused sick leave.
- Members are eligible to commence a normal retirement benefit after they have (i) attained age 65 with eight years of earned service or (ii) the combination of the member's age and years of credited service equals or exceeds 90 (i.e. the rule of 90).
- At each July 1 after their first full year of retirement, annuitants will receive a benefit adjustment equal to the lesser of 1.00% of their retirement benefit or \$500 per annum.

SECTION C

ACTUARIAL TABLES

Actuarial Tables

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Summary of Cost Items
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Projected payroll of active members ¹	\$ 9,788,610	\$ 9,272,010
2. Present value of future pay	\$ 76,844,962	\$ 73,365,374
3. Normal cost rate		
a. Total normal cost rate	10.63%	10.64%
b. Less: member contribution rate	<u>-9.00%</u>	<u>-9.00%</u>
c. Employer normal cost rate	1.63%	1.64%
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 27,052,541	\$ 25,649,944
b. Less: present value of future normal costs	<u>(7,850,761)</u>	<u>(7,511,934)</u>
c. Actuarial accrued liability	\$ 19,201,780	\$ 18,138,010
5. Total actuarial accrued liability		
a. Retirees and beneficiaries	\$ 31,534,153	\$ 31,051,873
b. Inactive members	1,325,312	1,248,924
c. Active members (Item 4c)	<u>19,201,780</u>	<u>18,138,010</u>
d. Total	\$ 52,061,245	\$ 50,438,807
6. Actuarial value of assets	\$ 28,171,964	\$ 27,443,804
7. Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	\$ 23,889,281	\$ 22,995,003
8. Required Contribution Rate		
a. Employer normal cost rate	1.63%	1.64%
b. Employer contribution rate available to amortize the UAAL	<u>14.93%</u>	<u>13.92%</u>
c. Total employer contribution rate	16.56%	15.56%
9. Funding period based on the required employer contribution rate (years) ²	20	23
10. Applicable statutorily required contribution rates ³		
a. Employer contribution rate	16.56%	15.56%
b. Member contribution rate	9.00%	9.00%

¹ The projected payroll does not include payroll for members in ORP or working retirees.

² The 23 year funding period shown for 2019 is based on the contribution rate schedule as modified by Act 135 of 2020. The funding period for 2020 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2022 (i.e. beginning July 1, 2021 and ending June 30, 2022).

³ The employer contribution rates in effect for FY 2020, FY 2021, and FY 2022, are 15.56%, 15.56%, and 16.56% of pay, respectively. These scheduled contribution rates was enacted by the Retirement System Funding and Administration Act of 2017, as amended by Act 135 of 2020. These contribution rates include the cost of incidental death benefits.



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

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Service retirement	\$ 23,422,295	\$ 22,196,708
b. Deferred termination benefits and refunds	1,256,288	1,193,353
c. Survivor benefits	748,736	711,480
d. Disability benefits	1,625,222	1,548,403
e. Total	<u>\$ 27,052,541</u>	<u>\$ 25,649,944</u>
2. Retired members		
a. Service retirement	\$ 28,486,784	\$ 28,031,959
b. Disability retirement	1,598,893	1,631,676
c. Beneficiaries	1,258,454	1,202,879
d. Incidental death benefits	190,022	185,359
e. Total	<u>\$ 31,534,153</u>	<u>\$ 31,051,873</u>
3. Inactive members		
a. Vested terminations	\$ 975,281	\$ 942,108
b. Nonvested terminations	350,031	306,816
c. Total	<u>\$ 1,325,312</u>	<u>\$ 1,248,924</u>
4. Total actuarial present value of future benefits	\$ 59,912,006	\$ 57,950,741

Analysis of Normal Cost

	<u>July 1, 2020</u> (1)	<u>July 1, 2019</u> (2)
1. Total normal cost rate		
a. Service retirement	7.19%	7.21%
b. Deferred termination benefits and refunds	2.23%	2.22%
c. Survivor benefits	0.35%	0.35%
d. Disability benefits	<u>0.74%</u>	<u>0.74%</u>
e. Total	10.51%	10.52%
2. Administrative expenses	0.12%	0.12%
3. Less: member contribution rate	<u>9.00%</u>	<u>9.00%</u>
4. Net employer normal cost rate	1.63%	1.64%

Results of July 1, 2020 Valuation
(Dollar amounts expressed in thousands)

	<u>July 1, 2020</u> (1)
1. <u>Actuarial Present Value of Future Benefits</u>	
a. Present retired members and beneficiaries	\$ 31,534,153
b. Present active and inactive members	<u>28,377,853</u>
c. Total actuarial present value	\$ 59,912,006
2. <u>Present Value of Future Normal Contributions</u>	
a. Member	\$ 6,916,047
b. Employer	<u>934,714</u>
c. Total future normal contributions	\$ 7,850,761
3. <u>Actuarial Liability</u>	\$ 52,061,245
4. <u>Current Actuarial Value of Assets</u>	\$ 28,171,964
5. <u>Unfunded Actuarial Liability</u>	\$ 23,889,281
6. <u>UAAL Amortization Rates Based on an Employer Contribution Rate of 16.56%</u>	
a. Active members	14.93%
b. ORP members	11.56%
c. Re-employed retirees (including employee contributions)	25.56%
7. <u>Unfunded Actuarial Liability Liquidation Period</u>	20 years

Note: The employer contribution rate includes the cost for incidental death benefits.

Actuarial Balance Sheet
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. <u>Assets</u>		
a. Current assets (actuarial value)		
i. Employee annuity savings fund	\$ 9,714,420	\$ 9,106,401
ii. Employer annuity accumulation fund	<u>18,457,544</u>	<u>18,337,403</u>
iii. Total current assets	\$ 28,171,964	\$ 27,443,804
b. Present value of future member contributions	\$ 6,916,047	\$ 6,602,884
c. Present value of future employer contributions		
i. Normal contributions	\$ 934,714	\$ 909,050
ii. Accrued liability contributions	<u>23,889,281</u>	<u>22,995,003</u>
iii. Total future employer contributions	\$ 24,823,995	\$ 23,904,053
d. Total assets	\$ 59,912,006	\$ 57,950,741
2. <u>Liabilities</u>		
a. Employee annuity savings fund		
i. Past member contributions	\$ 9,714,420	\$ 9,106,401
ii. Present value of future member contributions	<u>6,916,047</u>	<u>6,602,884</u>
iii. Total contributions to employee annuity savings fund	\$ 16,630,467	\$ 15,709,285
b. Employer annuity accumulation fund		
i. Benefits currently in payment	\$ 31,534,153	\$ 31,051,873
ii. Benefits to be provided to other members	<u>11,747,386</u>	<u>11,189,583</u>
iii. Total benefits payable from employer annuity accumulation fund	\$ 43,281,539	\$ 42,241,456
c. Total liabilities	\$ 59,912,006	\$ 57,950,741

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

Item (1)	July 1, 2020 (2)	July 1, 2019 (3)
1. Cash and cash equivalents (operating cash)	\$ 2,933,744	\$ 2,098,978
2. Receivables	1,480,759	1,542,981
3. Investments		
a. Short-term securities	\$ 272,550	\$ 340,059
b. Fixed income (global)	3,207,714	3,899,462
c. Global public equities	11,678,233	9,827,095
d. Opportunistic	191,951	2,300,496
e. Alternative investments	8,955,407	8,574,936
f. Total investments	\$ 24,305,855	\$ 24,942,048
4. Securities lending cash collateral invested	\$ 17,216	\$ 34,886
5. Prepaid administrative expenses	674	3,294
6. Capital assets, net of accumulated depreciation	1,938	2,010
7. Total assets	\$ 28,740,186	\$ 28,624,197
8. Liabilities		
a. Due to other systems	\$ 96	\$ 119
b. Accounts payable	2,133,526	1,081,545
c. Investment fees payable	6,557	9,756
d. Obligations under securities lending	17,216	34,886
e. Deferred retirement benefits	0	70
f. Due to employee insurance program	78,835	72,466
g. Benefit payable	5,144	4,882
h. Other liabilities	206,394	181,557
i. Total liabilities	\$ 2,447,768	\$ 1,385,281
9. Total market value of assets available for benefits (Item 7 - Item 8.i.)	\$ 26,292,418	\$ 27,238,916
10. Asset allocation (investments) ¹		
a. Short-term securities	8.6%	9.7%
b. Fixed income	12.2%	14.3%
c. Public equities	44.4%	36.1%
d. Global tactical asset allocation	0.7%	8.4%
e. Alternative investments	34.1%	31.5%
f. Total investments	100.0%	100.0%

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, 2020 (1)	July 1, 2019 (2)
1. Value of assets at beginning of year	\$ 27,238,916	\$ 26,414,916
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 922,539	\$ 880,664
ii. Employer contributions	1,648,048	1,450,628
ii. Nonemployer contributions	88,706	88,706
iii. Total	\$ 2,659,293	\$ 2,419,998
b. Income		
i. Interest, dividends, and other income	\$ 515,673	\$ 523,957
ii. Investment expenses	(194,878)	(279,952)
iii. Net	\$ 320,795	\$ 244,005
c. Net realized and unrealized gains (losses)	(762,375)	1,255,386
d. Total revenue	\$ 2,217,713	\$ 3,919,389
3. Expenditures for the year		
a. Disbursements		
i. Refunds	\$ 117,860	\$ 118,067
ii. Regular annuity benefits	3,007,545	2,938,416
iii. Other benefit payments	23,041	22,126
iv. Transfers to other systems	1,547	1,244
v. Total	\$ 3,149,993	\$ 3,079,853
b. Administrative expenses and depreciation	14,218	15,536
c. Total expenditures	\$ 3,164,211	\$ 3,095,389
4. Increase in net assets (Item 2. - Item 3.)	\$ (946,498)	\$ 824,000
5. Value of assets at end of year (Item 1. + Item 4.)	\$ 26,292,418	\$ 27,238,916
6. Net external cash flow		
a. Dollar amount	\$ (504,918)	\$ (675,391)
b. Percentage of market value	-1.9%	-2.5%

Development of Actuarial Value of Assets
(Dollar amounts expressed in thousands)

				Year Ending June 30, 2020
1.	Actuarial value of assets at beginning of year	\$		27,443,804
2.	Market value of assets at beginning of year	\$		27,238,916
3.	Net new investments			
a.	Contributions	\$		2,659,293
b.	Disbursements			(3,164,211)
c.	Subtotal			(504,918)
4.	Market value of assets at end of year	\$		26,292,418
5.	Net earnings (Item 4. - Item 2. - Item 3.c.)	\$		(441,580)
6.	Assumed investment return rate for fiscal year			7.25%
7.	Expected return (Item 6. x (Item 2. + 1/2 Item 3.c))	\$		1,956,518
8.	Excess return (Item 5. - Item 7.)	\$		(2,398,098)
9.	Excess return on assets as of June 30, 2020:			
	<u>Fiscal Year</u> <u>Ending June 30,</u> (1)	<u>Excess</u> <u>Return</u> (2)	<u>Percent</u> <u>Deferred</u> (3)	<u>Deferred</u> <u>Amount</u> (4)
a.	2020	\$ (2,398,098)	80%	\$ (1,918,478)
b.	2019	(391,207)	60%	(234,724)
c.	2018	168,619	40%	67,448
d.	2017	1,031,041	20%	206,208
e.	2016	(2,027,545)	0%	0
f.	Total			\$ (1,879,546)
10.	Actuarial value of assets as of June 30, 2020 (Item 4. - Item 9.f.)	\$		28,171,964
11.	Expected actuarial value as of June 30, 2020	\$		28,910,259
12.	Asset gain (loss) for year (Item 10. - Item 11.)	\$		(738,295)
13.	Asset gain (loss) as % of the actuarial value of assets			-2.6%
14.	Ratio of actuarial value to market value			107.1%

Estimation of Yields
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2020 (1)	July 1, 2019 (2)
1. Market value yield		
a. Beginning of year market assets	\$ 27,238,916	\$ 26,414,916
b. Contributions to fund during the year	2,659,293	2,419,998
c. Disbursements	(3,164,211)	(3,095,389)
d. Investment income (net of investment expenses)	<u>(441,580)</u>	<u>1,499,391</u>
e. End of year market assets	\$ 26,292,418	\$ 27,238,916
f. Estimated dollar-weighted market value yield	-1.6%	5.7%
2. Actuarial value yield		
a. Beginning of year actuarial assets	\$ 27,443,804	\$ 27,030,937
b. Contributions to fund during the year	2,659,293	2,419,998
c. Disbursements	(3,164,211)	(3,095,389)
d. Investment income (net of investment expenses)	<u>1,233,078</u>	<u>1,088,258</u>
e. End of year actuarial assets	\$ 28,171,964	\$ 27,443,804
f. Estimated actuarial value yield	4.5%	4.1%

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)
2006	22,293,446	32,018,519	9,725,073	69.6%	6,733,379	144.4%
2007	23,541,438	33,766,678	10,225,240	69.7%	7,093,181	144.2%
2008	24,699,678	35,663,419	10,963,741	69.3%	7,559,172	145.0%
2009	25,183,062	37,150,315	11,967,253	67.8%	7,761,808	154.2%
2010	25,400,331	38,774,029	13,373,698	65.5%	7,769,820	172.1%
2011	25,604,823	38,011,610	12,406,787	67.4%	7,687,558	161.4%
2012	25,540,749	39,457,708	13,916,959	64.7%	7,356,231	189.2%
2013	25,753,068	41,196,062	15,442,994	62.5%	7,434,820	207.7%
2014	26,910,740	42,889,614	15,978,874	62.7%	7,539,996	211.9%
2015	27,365,921	44,119,176	16,753,255	62.0%	7,765,588	215.7%
2016	27,293,968	45,859,906	18,565,938	59.5%	8,213,042	226.1%
2017	27,241,570	48,374,725	21,133,155	56.3%	8,592,885	245.9%
2018	27,030,937	49,104,763	22,073,826	55.0%	9,183,081	240.4%
2019	27,443,804	50,438,807	22,995,003	54.4%	9,272,010	248.0%
2020	28,171,964	52,061,245	23,889,281	54.1%	9,788,610	244.1%

¹ Covered payroll does not include payroll attributable to members in ORP or working retirees.

Summary of Principle Assumptions and Methods

Below is a summary of the principle economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

Valuation date:	July 1, 2020
Actuarial cost method:	Entry Age Normal
Amortization method:	Level percentage of payroll
Amortization period for contribution rate:	27-year maximum, closed period ¹
Asset valuation method:	5-Year Smoothed
Actuarial assumptions:	
Investment rate of return ²	7.25%
Projected salary increases	3.00% to 12.50% (varies by service)
Inflation	2.25%
Post-retirement benefit adjustments ³	1.00%
Retiree Mortality	2016 Public Retirees of South Carolina Mortality Table for Males and Females, projected using AA from the year 2016. Male rates multiplied by 100% for non-educators and 92% for educators. Female rates multiplied by 111% for non-educators and 98% for educators.

¹ The employer and member contribution rates are determined in accordance with Section 9-1-1085 of the South Carolina Code. For 2020, the funding period determined on an actuarial value of asset basis may not exceed 27 years. Contribution rates are not permitted to decrease until the ratio of the actuarial value of assets and the actuarial accrued liability is at least 85%.

² This is a prescribed assumption in Section 9-16-335 of South Carolina State Code.

³ The benefit increase is the lesser of 1.00% or \$500 annually.

Solvency Test
(Dollar amounts expressed in thousands)

July 1, (1)	Actuarial Accrued Liability			Valuation Assets (5)	Portion of Aggregate Accrued Liabilities Covered by Assets		
	Active Member Contributions (2)	Retirants & Beneficiaries (3)	Active & Inactive Members (Employer Financed) (4)		Active (6)	Retirants (7)	ER Financed (8)
2006	\$ 5,229,175	\$ 17,800,254	\$ 8,989,090	\$ 22,293,446	100.0%	95.9%	0.0%
2007	5,464,756	19,084,672	9,217,250	23,541,438	100.0%	94.7%	0.0%
2008	5,708,022	20,624,862	9,329,937	24,699,678	100.0%	92.1%	0.0%
2009	5,980,022	21,381,561	9,788,732	25,183,062	100.0%	89.8%	0.0%
2010	6,222,854	22,585,243	9,965,932	25,400,331	100.0%	84.9%	0.0%
2011	6,472,646	23,160,658	8,378,306	25,604,823	100.0%	82.6%	0.0%
2012	6,459,192	24,732,406	8,266,110	25,540,749	100.0%	77.2%	0.0%
2013	6,491,895	26,548,472	8,155,695	25,753,068	100.0%	72.6%	0.0%
2014	6,717,327	27,942,644	8,229,643	26,910,740	100.0%	72.3%	0.0%
2015	7,054,277	28,645,954	8,418,945	27,365,921	100.0%	70.9%	0.0%
2016	7,447,442	29,830,649	8,581,815	27,293,968	100.0%	66.5%	0.0%
2017	7,938,850	30,745,598	9,690,277	27,241,570	100.0%	62.8%	0.0%
2018	8,501,051	30,760,223	9,843,489	27,030,937	100.0%	60.2%	0.0%
2019	9,106,401	31,051,873	10,280,533	27,443,804	100.0%	59.1%	0.0%
2020	9,714,420	31,534,153	10,812,672	28,171,964	100.0%	58.5%	0.0%

SECTION D

MEMBERSHIP INFORMATION

Membership Information

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Summary of Membership Data

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Males	62,035	62,220
b. Females	139,109	138,044
c. Total members	201,144	200,264
d. Total annualized prior year salaries	\$ 9,358,511,333	\$ 8,889,143,919
e. Average salary	\$ 46,526	\$ 44,387
f. Average age	45.5	45.3
g. Average service	10.3	10.2
h. Member contributions with interest	\$ 8,584,976,288	\$ 8,047,590,539
i. Average contributions with interest	\$ 42,681	\$ 40,185
2. Vested inactive members		
a. Number	22,419	22,318
b. Total annual deferred benefits	\$ 161,505,336	\$ 157,996,923
c. Average annual deferred benefit	\$ 7,204	\$ 7,079
3. Nonvested inactive members		
a. Number	176,507	168,795
b. Member contributions with interest	\$ 350,031,263	\$ 306,815,527
c. Average contributions with interest	\$ 1,983	\$ 1,818
4. Service retirees		
a. Number	123,268	121,544
b. Total annual benefits	\$ 2,733,186,885	\$ 2,665,971,508
c. Average annual benefit	\$ 22,173	\$ 21,934
d. Average age at the valuation date	71.4	71.0
e. Average age at retirement date	59.1	59.0
5. Disabled retirees		
a. Number	12,125	12,394
b. Total annual benefits	\$ 175,644,913	\$ 177,307,639
c. Average annual benefit	\$ 14,486	\$ 14,306
d. Average age at the valuation date	66.6	66.0
e. Average age at retirement date	51.9	51.9
6. Beneficiaries		
a. Number	10,738	10,354
b. Total annual benefits	\$ 138,210,070	\$ 131,232,931
c. Average annual benefit	\$ 12,871	\$ 12,675
d. Average age at the valuation date	68.0	67.9

Note: Total salaries for active members is their annualized pay for the prior year.

South Carolina Retirement System

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Table 13



Summary of Contributing Membership Data

(Dollar amounts expressed in thousands)

	June 30, 2020 (1)	June 30, 2019 (2)
1. Active Members		
a. Number of state employees	55,867	54,180
Total annual compensation	\$ 2,802,430	\$ 2,634,376
b. Number of public school employees	89,103	89,477
Total annual compensation	\$ 3,977,491	\$ 3,775,414
c. Number of other agency employees	56,174	56,607
Total annual compensation	\$ 2,578,590	\$ 2,479,354
Total number of active members	201,144	200,264
Total annual compensation	\$ 9,358,511	\$ 8,889,144
2. Rehired Retired Participants		
a. Number of state employees	3,102	3,492
Total annual compensation	\$ 117,307	\$ 133,880
b. Number of public school employees	6,754	7,847
Total annual compensation	\$ 257,725	\$ 278,779
c. Number of other agency employees	2,350	2,495
Total annual compensation	\$ 103,836	\$ 111,776
Number of rehired retired members	12,206	13,834
Total annual compensation	\$ 478,868	\$ 524,435
3. ORP Participants		
a. Number of state employees	17,604	17,005
Total annual compensation	\$ 1,154,095	\$ 1,078,350
b. Number of public school employees	12,011	11,582
Total annual compensation	\$ 529,734	\$ 482,316
Number of ORP members	29,615	28,587
Total annual compensation	\$ 1,683,829	\$ 1,560,666
4. All Groups Combined		
a. Number of state employees	76,573	74,677
Total annual compensation	\$ 4,073,832	\$ 3,846,606
b. Number of public school employees	107,868	108,906
Total annual compensation	\$ 4,764,950	\$ 4,536,509
c. Number of other agency employees	58,524	59,102
Total annual compensation	\$ 2,682,426	\$ 2,591,130
Total number members	242,965	242,685
Total annual compensation	\$ 11,521,208	\$ 10,974,245

Note: Total compensation is the annualized pay for the prior year.



Summary of Historical Active Membership

July 1, (1)	Number of Employers ² (2)	Active Members		Covered Payroll ¹		Average Annual Pay		Average Age (9)	Average Service (10)
		Number (3)	Percent Increase /(Decrease) (4)	Amount in Thousands (5)	Percent Increase /(Decrease) (6)	Amount (7)	Percent Increase /(Decrease) (8)		
2006	763	184,282	1.8%	6,733,379	5.9%	36,538	4.06%	45.0	10.0
2007	777	187,968	2.0%	7,093,181	5.3%	37,736	3.28%	45.0	10.0
2008	776	192,820	2.6%	7,559,172	6.6%	39,203	3.89%	44.8	9.7
2009	781	192,319	-0.3%	7,761,808	2.7%	40,359	2.95%	45.0	9.9
2010	800	190,239	-1.1%	7,769,820	-4.7%	40,842	1.20%	45.2	10.2
2011	803	187,611	-1.4%	7,687,558	-1.1%	40,976	0.33%	45.5	10.5
2012	806	185,748	-1.0%	7,356,231	-4.3%	39,603	-3.35%	45.3	10.4
2013	808	184,690	-0.6%	7,434,820	1.1%	40,256	1.65%	45.2	10.2
2014	810	185,265	0.3%	7,539,996	1.4%	40,698	1.10%	45.2	10.2
2015	816	187,318	1.1%	7,765,588	3.0%	41,457	1.86%	45.1	10.2
2016	812	190,923	1.9%	8,213,042	5.8%	43,018	3.77%	45.1	10.1
2017	807	193,985	1.6%	8,592,885	4.6%	44,297	2.97%	45.1	10.1
2018	812	196,184	1.1%	8,797,592	2.4%	44,844	1.23%	45.2	10.1
2019	814	200,264	2.1%	9,272,010	5.4%	46,299	3.25%	45.3	10.2
2020	817	201,144	0.4%	9,788,610	5.6%	48,665	5.11%	45.5	10.3

¹ Covered payroll is the annualized, projected compensation for the following year and does not include payroll attributable to members in ORP or working retirees.

² Based on the number of employers that made a contribution during FY 2020. Also, each agency is considered to be separate participating employer for disclosure in this schedule.



Distribution of Active Members by Age and by Years of Service

Attained Age	Years of Credited Service												
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Total
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 20	391	40	3	0	0	0	0	0	0	0	0	0	434
	\$13,910	\$11,344	\$13,720	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,672
20-24	2,840	2,246	943	287	125	50	0	0	0	0	0	0	6,491
	\$23,411	\$30,319	\$32,186	\$31,003	\$35,299	\$32,132	\$0	\$0	\$0	\$0	\$0	\$0	\$27,708
25-29	2,977	3,612	3,052	2,681	1,998	2,748	27	0	0	0	0	0	17,095
	\$28,610	\$33,751	\$36,444	\$38,883	\$40,135	\$41,813	\$35,574	\$0	\$0	\$0	\$0	\$0	\$36,186
30-34	2,315	2,714	2,191	2,022	1,933	8,112	1,802	35	0	0	0	0	21,124
	\$30,890	\$35,736	\$37,820	\$40,845	\$42,801	\$46,373	\$50,322	\$48,111	\$0	\$0	\$0	\$0	\$41,906
35-39	1,906	2,299	1,834	1,642	1,468	5,874	6,230	1,827	47	0	0	0	23,127
	\$31,238	\$36,455	\$38,910	\$42,527	\$42,978	\$48,354	\$54,493	\$57,083	\$51,837	\$0	\$0	\$0	\$46,607
40-44	1,635	2,041	1,677	1,430	1,290	4,960	4,360	4,981	1,928	22	0	0	24,324
	\$30,305	\$36,595	\$38,886	\$40,886	\$43,493	\$48,942	\$55,335	\$60,620	\$63,016	\$48,599	\$0	\$0	\$49,850
45-49	1,577	1,916	1,412	1,273	1,189	4,825	4,016	3,911	5,590	1,569	28	0	27,306
	\$31,133	\$38,626	\$40,043	\$40,136	\$43,937	\$46,722	\$53,948	\$58,837	\$65,575	\$68,936	\$50,242	\$0	\$52,417
50-54	1,412	1,773	1,321	1,218	1,134	4,408	3,960	3,416	4,204	3,958	884	12	27,700
	\$30,741	\$39,046	\$38,174	\$39,734	\$41,202	\$45,274	\$50,734	\$54,203	\$61,010	\$68,916	\$67,624	\$65,615	\$51,756
55-59	1,143	1,477	1,107	1,051	1,023	3,780	3,759	3,459	3,814	2,639	1,680	254	25,186
	\$29,001	\$37,073	\$37,521	\$37,542	\$41,098	\$43,782	\$48,204	\$50,091	\$54,298	\$61,779	\$70,141	\$66,952	\$49,070
60-64	733	896	729	712	681	3,079	2,822	2,564	2,928	2,076	886	371	18,477
	\$28,752	\$35,656	\$33,960	\$37,485	\$38,421	\$42,732	\$45,991	\$48,566	\$52,276	\$58,646	\$65,225	\$72,435	\$47,410
65 & Over	635	656	507	459	463	1,945	1,632	1,176	1,077	690	346	294	9,880
	\$16,474	\$22,489	\$23,930	\$24,156	\$29,573	\$34,081	\$44,387	\$49,165	\$53,132	\$57,373	\$64,136	\$81,538	\$40,652
Total	17,564	19,670	14,776	12,775	11,304	39,781	28,608	21,369	19,588	10,954	3,824	931	201,144
	\$28,176	\$35,111	\$36,982	\$39,198	\$41,348	\$45,444	\$51,502	\$55,164	\$59,443	\$64,485	\$67,731	\$73,726	\$46,526

Note: Average compensation for active members is their annualized pay for the prior year.



Schedule of Annuitants by Type of Benefit

Type of Benefit/ Form of Payment	Number	Annual Benefits Amount	Average Monthly Benefit
(1)	(2)	(3)	(4)
Service:			
Maximum & QDRO	84,242	\$ 1,751,138,856	\$ 1,732
100% J&S	21,195	504,311,801	1,983
50% J&S	12,922	354,736,357	2,288
10 Years C&L	259	6,039,391	1,943
Level Income	4,650	116,960,480	2,096
Subtotal:	123,268	\$ 2,733,186,885	1,848
Disability:			
Maximum	9,893	\$ 145,998,396	\$ 1,230
100% J&S	1,396	16,181,873	966
50% J&S	740	12,168,120	1,370
10 Years C&L	96	1,296,524	1,125
Subtotal:	12,125	\$ 175,644,913	1,207
Beneficiaries:	10,738	\$ 138,210,070	\$ 1,073
Total:	146,131	\$ 3,047,041,868	\$ 1,738

Distribution of Annuitants by Monthly Benefit

Monthly Benefit Amount				Number of Annuitants	Female	Male	Average Service
(1)				(2)	(3)	(4)	(5)
Under \$200				7,114	4,588	2,526	6.99
\$	200	-	399	12,811	9,145	3,666	10.43
	400	-	599	12,744	9,149	3,595	13.37
	600	-	799	10,790	7,912	2,878	16.14
	800	-	999	9,640	6,986	2,654	18.52
	1,000	-	1,199	8,887	6,465	2,422	20.65
	1,200	-	1,399	7,807	5,693	2,114	22.58
	1,400	-	1,599	7,214	5,200	2,014	23.76
	1,600	-	1,799	6,865	4,916	1,949	25.09
	1,800	-	1,999	6,361	4,532	1,829	26.19
	2,000	-	2,199	6,485	4,574	1,911	26.89
	2,200	-	2,399	7,056	5,202	1,854	27.64
	2,400	-	2,599	7,370	5,523	1,847	28.09
	2,600	-	2,799	7,424	5,657	1,767	28.36
	2,800	-	2,999	6,102	4,495	1,607	28.75
	3,000	-	3,199	4,454	3,108	1,346	29.11
	3,200	-	3,399	3,468	2,224	1,244	29.34
	3,400	-	3,599	2,350	1,430	920	29.42
	3,600	-	3,799	1,975	1,127	848	29.75
	3,800	-	3,999	1,655	869	786	29.62
	4,000	-	4,199	1,355	697	658	29.89
	4,200	-	4,399	1,093	535	558	30.05
	4,400	-	4,599	908	404	504	29.94
	4,600	-	4,799	721	283	438	30.63
	4,800	-	4,999	614	267	347	30.46
	5,000	-	5,499	978	364	614	30.85
	5,500	-	5,999	623	229	394	31.08
	6,000	-	6,499	391	109	282	31.56
	6,500	-	6,999	248	70	178	31.10
	7,000	-	7,499	177	41	136	31.66
	7,500	-	7,999	128	27	101	31.14
	8,000	&	Over	323	69	254	32.22
Total				146,131	101,890	44,241	21.75

Average age at retirement for service retirees as of July 1, 2020 is age 59.1.

Distribution of Average Annual Benefit by Employer and Age

Current Age	Public School		State		Other		Total	
	Number of Annuitants	Average Annual Benefit Amount	Number of Annuitants	Average Annual Benefit Amount	Number of Annuitants	Average Annual Benefit Amount	Number of Annuitants	Average Annual Benefit Amount
(1)	(2)	(3)	(2)	(3)	(4)	(5)	(6)	(7)
Under 50	808	\$ 8,817	874	\$ 9,127	712	\$ 8,058	2,394	\$ 8,704
50 - 54	1,028	23,239	1,015	21,962	806	18,931	2,849	21,565
55 - 59	3,775	27,940	2,946	24,952	1,726	22,039	8,447	25,692
60 - 64	8,884	24,764	6,429	23,738	3,722	19,698	19,035	23,427
65 - 69	15,676	22,374	11,393	22,399	6,412	17,437	33,481	21,437
70 - 74	16,294	21,893	11,887	23,052	6,128	15,486	34,309	21,150
75 - 79	9,802	19,500	7,959	22,802	3,797	13,216	21,558	19,612
80 - 84	5,451	17,733	4,818	22,195	2,213	12,293	12,482	18,491
85 - 89	3,219	17,433	2,745	21,176	1,238	11,552	7,202	17,849
90 And Over	2,166	17,451	1,572	19,764	636	11,688	4,374	17,444
Total	67,103	\$ 21,544	51,638	\$ 22,526	27,390	\$ 15,998	146,131	\$ 20,851

The annuitant counts includes all annuity recipients including disabled retirees and surviving beneficiaries. The average annual benefit amounts also includes post-retirement benefit adjustments (COLAs) provided to annuitants after their benefit commencement date.

Schedule of Retirants Added to And Removed from Rolls
(Dollar amounts except average allowance expressed in thousands)

Year Ended (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 (3)	Number (4)	Annual Benefits (5)	Number (6)	Annual Benefits (7)		
2006	4,621	\$ 118,271	2,083	\$ 24,099	97,205	\$ 1,704,589	5.8%	\$ 17,536
2007	5,944	130,286	2,252	28,455	100,897	1,806,420	6.0%	17,904
2008	6,021	132,856	2,396	30,178	104,522	1,909,098	5.7%	18,265
2009	6,190	101,813	2,698	36,834	108,014	1,974,077	3.4%	18,276
2010	6,596	151,348	3,216	44,049	111,394	2,081,376	5.4%	18,685
2011	6,336	141,242	2,358	31,382	115,372	2,191,236	5.3%	18,993
2012	9,523	205,050	2,968	44,099	121,927	2,352,188	7.3%	19,292
2013	9,088	204,581	3,319	50,142	127,696	2,506,627	6.6%	19,630
2014	7,084	148,060	3,270	49,971	131,510	2,604,716	3.9%	19,806
2015	6,640	133,490	3,510	54,660	134,640	2,683,547	3.0%	19,931
2016	6,515	133,741	3,300	50,824	137,855	2,766,463	3.1%	20,068
2017	6,044	132,616	3,611	57,354	140,288	2,841,725	2.7%	20,256
2018	5,841	127,882	3,851	63,463	142,278	2,906,144	2.3%	20,426
2019	5,753	130,114	3,739	61,746	144,292	2,974,512	2.4%	20,615
2020	5,805	141,580	3,966	69,050	146,131	3,047,042	2.4%	20,851

Annual benefits added to rolls includes the benefit adjustments provided to continuing retirees.

SECTION E

ASSESSMENT AND DISCLOSURE OF RISK

Risks Associated with Measuring the Accrued Liability And Actuarially Determined Contribution

(As Required by ASOP No. 51)

The determination of SCRS's accrued liability, actuarially determined contribution, and calculated funding period requires the use of assumptions regarding future economic and demographic experience. The risk measures illustrated in this section are intended to aid stakeholders in understanding the effects when future experience differs from the assumptions used in performing an actuarial valuation. These risk measures may also help with illustrating the potential volatility in the funded status and actuarially determined contributions that result from differences between actual experience and the expected experience based on the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience (economic and demographic) differing from the assumptions, changes in assumptions due to changing conditions, changes in contribution requirements due to modifications to the funding policy, and changes in the liability and cost due to changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risks that may reasonably be anticipated to significantly affect the System's future financial condition include:

- Investment risk – actual investment returns may differ from expected returns;
- Longevity risk – members may live longer or shorter than expected and receive pensions for a time period different than assumed;
- Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liabilities and contributions differing from expected;
- Salary and payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liabilities and contributions differing from expected;
- Asset/Liability mismatch – changes in assets may be inconsistent with changes in liabilities, thereby altering the relative difference between the assets and liabilities, which may alter the funded status and contribution requirements;
- Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions are not made in accordance with the System's funding policy or Statute, other anticipated payments to the plan are not made, or material changes occur in the anticipated number of covered employees, covered payroll, or another relevant contribution base.

On the other hand, effects of certain experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate of return, the funded status of the plan can be expected to decrease (or increase) more than anticipated.

The contribution rate in this report was established in accordance with Section 9-1-1085 of the South Carolina Code, as amended by the Retirement System Funding and Administration Act of 2017. These scheduled contribution rates were amended by Act 135 of 2020. However, stakeholders should be aware that the scheduled contribution rates specified in State Code do not necessarily guarantee that the contribution requirements will not increase in a future year.

Employer Risk with Contribution Rates

The funding policy, as amended by the Retirement System Funding and Administration Act of 2017 (as amended by Act 135), is intended to finance the unfunded actuarial accrued liability over a reasonable time period and provide stability in the employer contribution rates so employers are better able to budget their pension cost in future years. The greater the difference between the calculated funding period based on the contribution rate specified in State Code and the maximum permitted funding period also specified in State Code, the greater the ability for the System to incur some adverse experience without requiring an increase in the employer contribution rate.

However, providing stability in the contribution rates means that projecting the year the fund actually attains a 100% funded ratio becomes less certain. If actual experience is more favorable than assumed, then the year the fund attains a 100% funded ratio will be earlier than projected, but the projected year the fund attains a 100% funded ratio will be later than projected if actual experience is less favorable than assumed.

Plan Maturity Measures

Risks faced by a pension plan evolve over time. A relatively new plan with virtually no assets and paying few benefits will experience lower investment risk than a mature plan with a significant amount of assets and large number of members receiving benefits. There are a few measures that can assist stakeholders in understanding and comparing the maturity of a plan to other systems, which include:

- Ratio of market value of assets to payroll: The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. If assets are approximately the same as covered payroll, an investment return that is 5% different than assumed would equal 5% of payroll. In another example, if the assets are approximately twice as large as covered payroll, an investment return that is 5% different than assumed would equal 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.
- Ratio of actuarial accrued liability to payroll: The ratio of actuarial accrued liability to payroll can be used as a measure to indicate the potential volatility of contributions due to volatility in the liability experience. For instance, if the actuarial accrued liability is 5 times the size of the covered payroll, then a change in the liability that is 2% different than expected would be a change in magnitude that is 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.

- Ratio of active to retired members: A relatively mature open plan is likely to have close to the same number of actives to retirees resulting in a ratio that is around 1.0. On the other hand, a super-mature plan, or a plan that is closed to new entrants will have more retirees than active members resulting in a ratio below 1.0. As this ratio declines, a larger portion of the total actuarial accrued liability in the System is attributable to retirees. This metric also typically moves in tandem with the liability to payroll metric, which provides an indication of potential contribution volatility.
- Ratio of net cash flow to market value of assets: A negative net cash flow means that benefit payments exceed contributions and the plan is depending on investment earnings and possibly existing funds to make payments to retirees. A certain amount of negative net cash flow is expected to occur when benefits are prefunded and the plan has matured. However, a relatively large negative net cash flow as a percent of assets may be an indication of the need for additional contributions for a plan with a low funded ratio.

The following exhibit provides a summary of these measures for SCRS. We have also included these metrics for the prior four years so stakeholders can identify how these measures are trending.

Measure	July 1,				
	2020	2019	2018	2017	2016
Ratio of the market value of assets to total payroll	2.20	2.40	2.37	2.36	2.29
Ratio of actuarial accrued liability to payroll	4.36	4.45	4.41	4.43	4.37
Ratio of actives to retirees and beneficiaries	1.38	1.39	1.38	1.38	1.38
Ratio of net cash flow to market value of assets	-1.9%	-2.5%	-4.9%	-4.1%	-4.0%

Note: For purposes of this analysis, includes payroll for all members that the System receives contributions, including working retirees and members in the ORP.

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 South Carolina Retirement System.

Investment Rate of Return

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

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

Rates of Annual Salary Increase

Rates of annual salary increase are assumed to vary for the first 20 years of service due to expected merit and promotional increases which differs by employee group. Beginning with the 21st year of service, the assumed annual rate of increase is 3.00% for both groups and for all future years of service.

The 3.00% rate of increase is composed of a 2.25% inflation component and a 0.75% real rate of wage increase (productivity) component.

Active Male & Female Salary Increase Rate				
Years of Service	General Employees		Teachers	
	Annual Promotional/Longevity Rates of Increase	Total Annual Rate of Increase Including 3.00% Wage Inflation	Annual Promotional/Longevity Rates of Increase	Total Annual Rate of Increase Including 3.00% Wage Inflation
1	4.00%	7.00%	7.00%	10.00%
2	3.00%	6.00%	9.50%	12.50%
3	2.25%	5.25%	3.00%	6.00%
4	1.75%	4.75%	2.75%	5.75%
5	1.50%	4.50%	2.50%	5.50%
6	1.25%	4.25%	2.25%	5.25%
7	1.00%	4.00%	2.00%	5.00%
8	1.00%	4.00%	1.75%	4.75%
9	1.00%	4.00%	1.75%	4.75%
10	0.75%	3.75%	1.50%	4.50%
11	0.50%	3.50%	1.50%	4.50%
12	0.50%	3.50%	1.25%	4.25%
13	0.50%	3.50%	1.00%	4.00%
14	0.50%	3.50%	1.00%	4.00%
15	0.50%	3.50%	0.75%	3.75%
16	0.50%	3.50%	0.75%	3.75%
17	0.50%	3.50%	0.50%	3.50%
18	0.50%	3.50%	0.50%	3.50%
19	0.25%	3.25%	0.25%	3.25%
20	0.25%	3.25%	0.25%	3.25%
21+	0.00%	3.00%	0.00%	3.00%

Active Member Decrement Rates

- a. Assumed rate of Service Retirement are shown in the following tables. The first table provides retirement rates for Class Two members who attain age 65 before attaining 28 years of service. The second table is based on service and is for Class Two members who attain 28 years of service before age 65. The third table provides the retirement rates applicable to Class Three members.

Annual Age Based Retirement Rates*								
Age	Class Two							
	General Employees				Teachers			
	Reduced		Normal		Reduced		Normal	
	Male	Female	Male	Female	Male	Female	Male	Female
55	10%	9%	0%	0%	10%	9%	0%	0%
56	9%	10%	0%	0%	11%	9%	0%	0%
57	9%	10%	0%	0%	11%	10%	0%	0%
58	9%	11%	0%	0%	11%	10%	0%	0%
59	9%	11%	0%	0%	11%	10%	0%	0%
60	9%	11%	0%	0%	11%	10%	0%	0%
61	9%	11%	0%	0%	11%	13%	0%	0%
62	22%	20%	0%	0%	22%	20%	0%	0%
63	16%	18%	0%	0%	22%	20%	0%	0%
64	16%	18%	0%	0%	22%	20%	0%	0%
65	0%	0%	20%	22%	0%	0%	20%	25%
66	0%	0%	20%	22%	0%	0%	20%	25%
67	0%	0%	17%	19%	0%	0%	20%	20%
68	0%	0%	17%	19%	0%	0%	20%	20%
69	0%	0%	17%	19%	0%	0%	20%	20%
70	0%	0%	17%	19%	0%	0%	20%	20%
71	0%	0%	17%	19%	0%	0%	20%	20%
72	0%	0%	17%	19%	0%	0%	20%	20%
73	0%	0%	17%	19%	0%	0%	20%	20%
74	0%	0%	17%	19%	0%	0%	20%	20%
75	0%	0%	100%	100%	0%	0%	100%	100%

* Retirement rate is 50% at the later of age 62 or when the member is first eligible for a normal retirement benefit (i.e. the first age the member is eligible to concurrently commence benefits and continue employment.)

Class Two Service Based Retirement Rates*				
Years of Service	General Employees		Teachers	
	Male	Female	Male	Female
28	15%	18%	7%	8%
29	10%	10%	8%	9%
30	10%	10%	8%	9%
31	10%	10%	9%	10%
32	10%	10%	10%	11%
33	18%	20%	11%	12%
34	18%	20%	12%	18%
35	18%	20%	13%	18%
36	20%	20%	14%	18%
37	20%	20%	18%	18%
38	20%	20%	17%	19%
39	20%	20%	17%	20%
40+	100%	100%	100%	100%

* Retirement rate is 50% at the later of age 62 or when the member is first eligible for a normal retirement benefit (i.e. the first age the member is eligible to concurrently commence benefits and continue employment.)

Class Three Retirement Rates*									
Age	General Employees				Teachers				Ruleof 90**
	Reduced		Normal		Reduced		Normal		
	Male	Female	Male	Female	Male	Female	Male	Female	
55	0%	0%	0%	0%	0%	0%	0%	0%	20%
56	0%	0%	0%	0%	0%	0%	0%	0%	20%
57	0%	0%	0%	0%	0%	0%	0%	0%	20%
58	0%	0%	0%	0%	0%	0%	0%	0%	20%
59	0%	0%	0%	0%	0%	0%	0%	0%	20%
60	9%	11%	0%	0%	11%	10%	0%	0%	20%
61	9%	11%	0%	0%	11%	13%	0%	0%	20%
62	22%	20%	0%	0%	22%	20%	0%	0%	20%
63	16%	18%	0%	0%	22%	20%	0%	0%	20%
64	16%	18%	0%	0%	22%	20%	0%	0%	20%
65	0%	0%	20%	22%	0%	0%	20%	25%	20%
66	0%	0%	20%	22%	0%	0%	20%	25%	20%
67	0%	0%	17%	19%	0%	0%	20%	20%	20%
68	0%	0%	17%	19%	0%	0%	20%	20%	20%
69	0%	0%	17%	19%	0%	0%	20%	20%	20%
70	0%	0%	17%	19%	0%	0%	20%	20%	20%
71	0%	0%	17%	19%	0%	0%	20%	20%	20%
72	0%	0%	17%	19%	0%	0%	20%	20%	20%
73	0%	0%	17%	19%	0%	0%	20%	20%	20%
74	0%	0%	17%	19%	0%	0%	20%	20%	20%
75	0%	0%	100%	100%	0%	0%	100%	100%	100%

* Retirement rate is 50% at the later of age 62 or when the member is first eligible for a normal retirement benefit (i.e. the first age the member is eligible to concurrently commence benefits and continue employment.)

** The "Rule of 90" retirement rates do not apply if the "Rule of 90" is achieved after age 65.

b. Assumed rates of disability are shown in the following table.

Disability Rates				
Age	General Employees		Teachers	
	Males	Females	Males	Females
25	0.0504%	0.0440%	0.0419%	0.0458%
30	0.1008%	0.0616%	0.0629%	0.0616%
35	0.1512%	0.1232%	0.0838%	0.0616%
40	0.2520%	0.1584%	0.1572%	0.1074%
45	0.3528%	0.2288%	0.2620%	0.2200%
50	0.5040%	0.3872%	0.4192%	0.3520%
55	0.8064%	0.6160%	0.6812%	0.5720%
60	1.0080%	0.9416%	1.0480%	0.8800%
64	1.2600%	1.3112%	1.3100%	1.1000%

There is no differentiation between duty and nonduty related disability benefits.

c. Active Member Mortality

Rates of active member mortality are based upon the RP-2014 Mortality Table for Employees with applicable multipliers to better reflect anticipated experience and provide margin for future improvement in mortality.

Active Mortality Rates (Multiplier Applied)				
Age	General Employees		Teachers	
	Males	Females	Males	Females
25	0.0460%	0.0164%	0.0460%	0.0147%
30	0.0429%	0.0207%	0.0429%	0.0185%
35	0.0497%	0.0272%	0.0497%	0.0243%
40	0.0597%	0.0376%	0.0597%	0.0337%
45	0.0924%	0.0624%	0.0924%	0.0558%
50	0.1602%	0.1047%	0.1602%	0.0937%
55	0.2649%	0.1589%	0.2649%	0.1422%
60	0.4454%	0.2320%	0.4454%	0.2076%
64	0.7008%	0.3220%	0.7008%	0.2881%
Multiplier	95%	95%	95%	85%

For purposes of determining active death benefits, 5% of active deaths for general employees are assumed to be duty related.

d. Rates of Withdrawal

Rate of withdrawal for active members prior to eligibility for retirement are for each employee group and differ by gender and service. Sample rates are shown in the tables below.

Withdrawal Rates - Male General Employees															
Age	Years of Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.040	0.000	0.000	0.000	0.000
30	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.040	0.040	0.037	0.034	0.031
35	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.040	0.040	0.037	0.034	0.031
40	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.034	0.034	0.034	0.034	0.031
45	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.031	0.031	0.029	0.026	0.023
50	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.020	0.020	0.020	0.020	0.020
55	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.010	0.010	0.010	0.010	0.010
60	0.200	0.175	0.123	0.103	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age	Years of Service (Continued)														
	15	16	17	18	19	20	21	22	23	24	25	26	27	28+	
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
35	0.029	0.026	0.023	0.020	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
40	0.029	0.026	0.023	0.020	0.018	0.015	0.013	0.011	0.010	0.009	0.008	0.000	0.000	0.000	
45	0.020	0.020	0.020	0.020	0.018	0.015	0.013	0.011	0.010	0.009	0.008	0.007	0.006	0.000	
50	0.020	0.018	0.015	0.013	0.011	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.000	
55	0.010	0.010	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.000	0.000	0.000	0.000	
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

Withdrawal Rates - Female General Employees															
Age	Years of Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.046	0.000	0.000	0.000	0.000
30	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.046	0.046	0.042	0.038	0.034
35	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.046	0.046	0.042	0.038	0.034
40	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.038	0.038	0.038	0.038	0.034
45	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.034	0.034	0.030	0.026	0.023
50	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.020	0.020	0.020	0.020	0.020
55	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.012	0.012	0.012	0.012	0.012
60	0.230	0.217	0.141	0.118	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age	Years of Service (Continued)														
	15	16	17	18	19	20	21	22	23	24	25	26	27	28+	
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
35	0.030	0.026	0.023	0.020	0.018	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
40	0.030	0.026	0.023	0.020	0.018	0.016	0.014	0.013	0.012	0.011	0.010	0.000	0.000	0.000	
45	0.020	0.020	0.020	0.020	0.018	0.016	0.014	0.013	0.012	0.011	0.010	0.009	0.008	0.000	
50	0.020	0.018	0.016	0.014	0.013	0.012	0.012	0.012	0.012	0.011	0.010	0.009	0.008	0.000	
55	0.012	0.012	0.012	0.012	0.012	0.012	0.011	0.010	0.009	0.008	0.000	0.000	0.000	0.000	
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

Withdrawal Rates - Male Teachers															
Age	Years of Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.000	0.000	0.000	0.000
30	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.030	0.030	0.029	0.028
35	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.030	0.030	0.029	0.028
40	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.029	0.029	0.029	0.028
45	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.028	0.027	0.026	0.024
50	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.022	0.022	0.022	0.022
55	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.013	0.013	0.013	0.013
60	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.008	0.008	0.008	0.008
Age	Years of Service (Continued)														
	15	16	17	18	19	20	21	22	23	24	25	26	27	28+	
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
35	0.027	0.026	0.024	0.022	0.020	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
40	0.027	0.026	0.024	0.022	0.020	0.017	0.015	0.014	0.013	0.012	0.011	0.000	0.000	0.000	
45	0.022	0.022	0.022	0.022	0.020	0.017	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.000	
50	0.022	0.020	0.017	0.015	0.014	0.013	0.013	0.013	0.013	0.012	0.011	0.010	0.009	0.000	
55	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.011	0.010	0.009	0.008	0.008	0.008	0.000	
60	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.000	0.000	0.000	0.000	

Withdrawal Rates - Female Teachers															
Age	Years of Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.000	0.000	0.000	0.000
30	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.030	0.030	0.027	0.024
35	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.030	0.030	0.027	0.024
40	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.030	0.027	0.027	0.024
45	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.024	0.022	0.020	0.018
50	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.018	0.016	0.016	0.016
55	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.010	0.009	0.009	0.009
60	0.000	0.202	0.125	0.103	0.089	0.074	0.069	0.057	0.053	0.046	0.037	0.006	0.006	0.006	0.006
Age	Years of Service (Continued)														
	15	16	17	18	19	20	21	22	23	24	25	26	27	28+	
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
35	0.022	0.020	0.018	0.016	0.014	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
40	0.022	0.020	0.018	0.016	0.014	0.012	0.011	0.010	0.009	0.008	0.007	0.000	0.000	0.000	
45	0.016	0.016	0.016	0.016	0.014	0.012	0.011	0.010	0.009	0.008	0.007	0.006	0.006	0.000	
50	0.016	0.014	0.012	0.011	0.010	0.009	0.009	0.009	0.009	0.008	0.007	0.006	0.006	0.000	
55	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.007	0.006	0.006	0.006	0.006	0.006	0.000	
60	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.000	0.000	0.000	0.000	

Refund of Member Contributions

The following percentage of vested members are assumed to elect to receive a refund of contributions upon termination of employment prior to becoming eligible to commence a service retirement benefit. This assumption is based on the plan's experience.

Age:	<u>Less than 40</u>	<u>40 - 49</u>	<u>50 or More</u>
Refund rate:	45%	40%	35%

Post Retirement Mortality

- 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, projected using the AA projection table from the year 2016 and with multipliers based on plan experience. The following are sample rates of the base table:

Nondisabled Annuitant Mortality Rates Before Projection (Multiplier Applied)				
Age	General Employees		Teachers	
	Males	Females	Males	Females
50	0.2038%	0.1454%	0.1875%	0.1284%
55	0.3205%	0.2465%	0.2949%	0.2177%
60	0.5863%	0.4265%	0.5394%	0.3765%
65	1.0198%	0.5924%	0.9382%	0.5230%
70	1.5718%	0.9640%	1.4461%	0.8511%
75	2.7195%	1.8534%	2.5019%	1.6363%
80	5.0493%	3.7276%	4.6454%	3.2910%
85	9.1594%	7.0538%	8.4266%	6.2277%
90	15.9042%	12.3489%	14.6319%	10.9026%
Multiplier	100%	111%	92%	98%

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				
Employee Type	Year of Retirement			
	2020	2025	2030	2035
General Employee – Male	20.6	20.9	21.3	21.6
General Employee – Female	22.7	22.8	23.0	23.2
Teacher – Male	21.2	21.5	21.9	22.2
Teacher - Female	23.6	23.8	24.0	24.1

- 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 (Multiplier Applied)				
Age	General Employees		Teachers	
	Males	Females	Males	Females
50	2.5494%	1.4884%	2.5494%	1.4884%
55	2.9211%	1.8099%	2.9211%	1.8099%
60	3.3255%	2.1249%	3.3255%	2.1249%
65	3.9606%	2.6075%	3.9606%	2.6075%
70	5.0433%	3.5254%	5.0433%	3.5254%
75	6.7859%	5.1306%	6.7859%	5.1306%
80	9.5770%	7.6295%	9.5770%	7.6295%
85	14.1629%	11.3025%	14.1629%	11.3025%
90	21.6256%	16.5815%	21.6256%	16.5815%
Multiplier	125%	125%	125%	125%

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.

Expected earnings are determined using the assumed investment rate of return and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of investment expenses.

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 percent of payroll 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.

Development of the Contribution Rate and Funding Period

The calculation of the employer and member contribution rate as well as the derived funding period takes into account several differences in the contributions paid by the various members as well as the delayed timing (if any) in the effective date of the new contribution rate. Specifically, the factors that are reflected in the calculation of the contribution rate include:

- 1) The cost (normal cost and actuarial accrued liability) due to incidental death benefits provided to members in the ORP.
- 2) Member and employer contributions made on the payroll of working retirees are being used to finance the unfunded actuarial accrued liability since these members do not have a normal cost. Also, the number of working retirees is expected to decrease due to changes in working after retirement provisions enacted with the 2012 legislative changes.

- 3) The money collected on the payroll of members in ORP that is allocated to finance the unfunded liability in SCRS, which is the SCRS employer contribution rate less 5%, is less than the money collected on the payroll of members in SCRS to finance the unfunded actuarial accrued liability.
- 4) For purposes of calculating the amortization cost and funding period, discrete pay increases and continuous interest was assumed, with amortization payments made at the end of each month.

Unused Annual Leave

To account for the effect of unused annual leave in Average Final Compensation (AFC) of Class Two members, the AFC for Class Two members is increased 2.14% at their date of retirement. Unused annual leave is not included in the calculation of the AFC for Class Three members.

Unused Sick Leave

To account for the effect of unused sick leave on credited service for Class Two members, the service of active Class Two members who retire is increased 3 months. Unused sick leave is not included in determining the credited service for Class Three members.

Future Post-Retirement Benefit Adjustments

Benefits are assumed to increase by the lesser of 1.00% annually or \$500 beginning on the July 1st following the receipt of 12 monthly benefit payments. The \$500 limit in the annual increase is not indexed to escalate in future years.

Payroll Growth Rate

The total annual payroll of active members (also applies to ORP members and working retirees) is assumed to increase at an annual rate of 3.00%. This rate represents the underlying expected annual rate of wage inflation and does not anticipate increases in the number of members.

Other Assumptions

1. Valuation payroll (used for determining the amortization contribution rate): Prior fiscal year payroll projected forward one year using the overall payroll growth rate. This was determined for working retirees by dividing the actual member contributions received during the prior fiscal year by the member contribution rate in effect for that year, and then projecting that amount forward one year.
2. The normal cost rate is increased by 0.12% to account for administrative expenses that are paid with plan assets.
3. Individual salaries used to project benefits: Actual salaries from the past fiscal year are used to determine the final average salary as of the valuation date. For future salaries, the salary from the last fiscal year is projected forward with one year's salary scale.
4. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported salaries represent amounts paid to members during the year ended on the valuation date.
5. Percent married: 100% of male and 100% of female employees are assumed to be married.
6. Age difference: Males are assumed to be three years older than their spouses.

7. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.
8. Inactive Population: All non-vested members are assumed to take an immediate refund.
9. There will be no recoveries once disabled.
10. Decrement timing: Terminations for public school employees are assumed to occur at the beginning of the year. Decrements of all types are assumed to occur mid-year.
11. 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.
12. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
13. Incidence of contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
14. Benefit service: All members are assumed to accrue one year of service each year.
15. All calculations were performed without regard to the compensation limit in IRC Section 401(a)(17) and the benefit limit under IRC Section 415.

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 Retirement System (SCRS)

Effective Date: July 1, 1945.

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. Under GASB Statement Nos. 27, 67, and 68, it is considered to be a cost-sharing multiple-employer plan.

Eligibility: This System covers all permanent full-time or part-time employees of a covered employer (i.e. public school, state employer, city, county, and other local public governmental entity), unless specifically exempted by Statute or participate in the State Optional Retirement Program (ORP). Also, beginning with the 2012 general election, newly elected officials of the South Carolina General Assembly are also covered by this system.

Employee Contributions: Members are contributing 9.00% of earnable compensation on and after July 1, 2017. These contributions are "picked-up" under Section 414(h) of the Internal Revenue Code. Contributions are credited with interest at the rate of 4.0% per annum while the member is actively employed.

Average Final Compensation (AFC): The monthly average of the member's highest 12 consecutive quarters of earnable compensation (highest 20 consecutive quarters for Class Three members, members who are hired after June 30, 2012). Earnable compensation is the compensation that would be payable to a member if the member worked a full, normal working time, which includes gross salary, sick pay, and deferrals. Compensation due to overtime earned after December 31, 2012 will not be included unless that compensation is for time that is mandated by the employer.

The calculation of the AFC for Class One and Class Two members also includes up to 45 days pay for unused annual leave paid at termination. Members joining the System after January 1, 1996, have their compensation limited in accordance with IRC Section 401(a)(17) for determining benefits.



Service Retirement (Unreduced):

- a. Eligibility: Class Two members may retire with an unreduced benefit at age 65 with five years of earned service or after 28 years of creditable service, if earlier. Class Three members may retire with an unreduced benefit at age 65 with eight years of earned service or after the satisfying the rule of 90 (i.e. age plus credited service equals or exceeds 90).
- b. Monthly Benefit: 1.82% times the member's AFC times their years of creditable service.
- c. Payment Forms: Maximum retirement allowance (Option A) and survivor allowances under Options B and C.

Service Retirement (Reduced):

- a. Eligibility: Class Two members may retire with a reduced benefit upon attaining: (1) age 55 with 25 years of creditable service (minimum of 5 years of earned service), or (2) age 60 with five years of earned service. Class Three members may retire with a reduced benefit upon attaining age 60 with eight years of earned service.
- b. Reduction: A Class Two member's benefit will be reduced by either an age or service based reduction factor described below, whichever results in the most favorable benefit. A Class Three member's benefit will be reduced by the age based reduction factor described below.

Age Based: Members retiring after age 60 will have their benefit reduced at the rate of 5% per year for each year of their retirement age precedes age 65.

Service Based: 4% per year for each year of creditable service that is less than 28.

- c. Payment Forms: Maximum retirement allowance (Option A) and survivor allowances under Options B and C.

Disability Retirement:

- a. Eligibility: The eligibility for a disability retirement will be based upon the member's entitlement for Social Security disability benefits.
- b. Monthly Benefit: The net monthly disability benefit payable is equal to the member's benefit based on their credited service and AFC at the time of their disability.
- c. Payment Form: Maximum retirement allowance (Option A) and survivor allowances under Options B and C.
- 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. Class Two members are vested after five (5) years of earned service. Class Three members are vested after eight (8) years of earned 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 while they were actively employed. Members do not earn interest on their employee contribution account balance while they are inactive.

Deferred Termination Benefit:

- a. Eligibility: Member must be vested (i.e. 5 years of earned service for Class Two members and 8 years of earned service for Class Three members) and must elect to leave his/her contributions on deposit.
- b. Monthly Benefit: Same as the unreduced or reduced service retirement benefit, based on service and AFC at termination, and commencing once the member is eligible.
- c. Payment Form: Maximum retirement allowance (Option A) and survivor allowances under Options B and C.
- 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). If the member met service eligibility requirement at their time of death, the beneficiary is eligible for a monthly survivor annuity benefit.

Death while an Active Contributing 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 (i) attained 5 or more years of earned service and (ii) had attained the age of 60 or had accumulated 15 or more years of creditable service, may elect to receive, in lieu of the accumulated contributions, a monthly benefit for life of the beneficiary determined under "Option B" described under the Optional Forms of Benefit. For purposes of the benefit calculation, a member under the age of 60 with less than 28 years of creditable service is assumed to be 60 years of age and no age reduction applies.

Optional Forms of Benefit: The System permits members to elect from three forms of benefit at retirement. In each case the benefit amount is adjusted to be actuarially equivalent to the "Option A" form. The optional forms are:

- a. Option A (Maximum Retirement Allowance): 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 B (100% Joint & Survivor with Pop-up): A reduced annuity payable as long as either the member or his/her beneficiary(ies) are living. In the event the member's designated beneficiary predeceases the member, then the member shall receive a retirement allowance equal to the maximum retirement allowance (Option A), plus any applicable benefit adjustments that would have been granted.
- c. Option C (50% Joint & Survivor with Pop-up): 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(ies). In the event the member's designated beneficiary predeceases the member, then the member shall receive a retirement allowance equal to the maximum retirement allowance (Option A), plus any applicable benefit adjustments that would have been granted.

Incidental Death Benefit:

- a. Active Employees: The beneficiary (or estate) of an active employee of an employer participating in the Preretirement Death Benefit Program 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-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.

For purposes of incidental death benefits, active employees include those members who are receiving a retirement allowance and are actively reemployed and contributing to the system with a participating employer.

- b. Post Employment: The beneficiary (or estate) of a retiree, both current and retiree, of an employer participating in the Preretirement Death Benefit Program will receive a one-time payment upon the retiree's death. The amount of the one-time payment is based on the retiree's years of credited service at retirement.

Years of Service Credit	Death Benefit
10 or more, but less than 20	\$2,000
20 or more, but less than 28	\$4,000
28 or more	\$6,000

Postretirement Benefit Increases: Benefits paid to retired members or surviving spouses are increased annually in an amount equal to the lesser of 1.00% of the pension benefit or \$500. The \$500 limit in the annual increase is not indexed to escalate in future years.

A member electing a reduced early retirement is ineligible to receive a benefit increase until the second July 1 after the earlier of:

- (1) the member attains age 60, or
- (2) the member would have 28 years of creditable service had he not retired.

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.

Decrements: 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 Statement Nos. 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 may not decrease by exactly one year in the subsequent year's actuarial valuation. In some instances, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In other instances, the amortization period may "float" from year to year, meaning it could increase, decrease, or remain relatively unchanged from the amortization period in the prior year's valuation.

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.

DRAFT

Police Officers Retirement System (PORS)

Actuarial Valuation Report
as of July 1, 2020





November 24, 2020

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

Subject: Actuarial Valuation as of July 1, 2020

Dear Members of the Board:

This report describes the current actuarial condition of the Police Officers Retirement System (PORS), determines the unfunded liability and calculated funding period based on the scheduled employer and member contribution rates, as well as analyzes changes in this 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) Statements No. 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 PORS. 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.

FINANCING OBJECTIVES AND FUNDING POLICY

The employer contribution rate is established in accordance with Section 9-11-255 of the South Carolina Code, as amended by the Retirement System Funding and Administration Act of 2017 and last modified by Act 135 of 2020. The employer contribution rate in effect for the fiscal year ending June 30, 2021 is 18.24% and is scheduled to increase by 1.00% of pay for each of the next three fiscal years until an ultimate employer contribution rate of 21.24% of pay is attained for fiscal year 2024.

Additionally, the Statute specifies that the maximum amortization period is 27 years as of July 1, 2020 and the maximum amortization period will decrease by one year in each of the next seven years until reaching a maximum 20-year funding period on July 1, 2027. The employer contribution rate determined by an actuarial valuation must be sufficient to maintain an amortization period that does not exceed 20 years each year thereafter. Finally, the Board is not permitted to decrease the employer and member contribution rates until the funded ratio of the plan is at least 85%.

If new legislation is enacted between the valuation date and the date the contribution rate becomes effective, the Board may adjust the calculated rate before certifying them, in order to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

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 System slightly decreased from 62.7% to 62.5% in the most recent plan year. Absent unfavorable investment or liability experience, and assuming the increases in contribution rates continue as currently scheduled, it is currently projected that the funded ratio will gradually improve.

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 been 58.3%, compared to 62.2% in the prior year. The decrease in the funded ratio on a market value basis is primarily due to unfavorable investment experience during the last fiscal year. Plan assets earned a -1.58% return on a time weighted-basis (net of fees) as reported in the financial statement of the South Carolina Retirement Systems for the year ending June 30, 2020. The -1.6% return documented in this report was determined on a dollar-weighted basis and assumes mid-year cash flows.

ASSUMPTIONS AND METHODS

There were no assumption changes since the prior actuarial valuation. These assumptions are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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.

This report was prepared using our proprietary valuation model and related software, which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2020. There were no legislative changes enacted since the prior valuation that changed or modified the benefits that members earn or receive.

DATA

Member data for retired, active and inactive members was supplied as of July 1, 2020, by the PEBA staff. The staff also supplied asset information as of July 1, 2020. 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 PORS as of July 1, 2020.

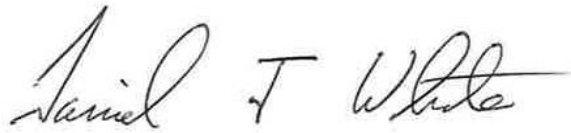
All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of South Carolina Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. All three are also Enrolled Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. Each are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.



Joseph P. Newton, FSA, MAAA, EA
Pension Market Leader and Actuary



Daniel J. White, FSA, MAAA, EA
Senior Consultant



Thomas Lyle, FSA, MAAA, EA
Consultant

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SECTION A

EXECUTIVE SUMMARY

Executive Summary

(Dollar amounts expressed in thousands)

	Valuation Date:	
	July 1, 2020	July 1, 2019
Membership <ul style="list-style-type: none"> Number of <ul style="list-style-type: none"> Active members 27,795 Retirees and beneficiaries 19,625 Inactive members 18,811 Total 66,231 Projected payroll of active members \$1,440,645 Projected payroll for all active members, including working retirees \$1,556,669 		27,397 19,094 17,944 64,435 \$1,378,255 \$1,494,540
Required Contribution Rates <ul style="list-style-type: none"> Employer contribution rate ¹ 19.24% Member 9.75% 		18.24% 9.75%
Assets <ul style="list-style-type: none"> Market value \$4,730,175 Actuarial value 5,069,748 Return on market value -1.6% Return on actuarial value 4.6% Ratio - actuarial value to market value 107.2% External cash flow % -0.1% 		\$4,815,809 4,852,573 5.8% 4.7% 100.8% -0.3%
Actuarial Information <ul style="list-style-type: none"> Normal cost % 14.47% Actuarial accrued liability (AAL) \$8,111,938 Unfunded actuarial accrued liability (UAAL) 3,042,190 Funded ratio 62.5% Funding period (years) ² 18 		14.54% \$7,737,415 2,884,842 62.7% 20
Reconciliation of UAAL <ul style="list-style-type: none"> Beginning of Year UAAL \$2,884,842 - Interest on UAAL 209,151 - Amortization payment (229,602) - Assumption/method changes 0 - Asset experience 130,430 - Salary experience 38,748 - Other liability experience 8,621 - Legislative Changes 0 End of Year UAAL \$3,042,190 		\$2,723,891 197,482 (198,126) 0 122,108 14,408 25,079 0 \$2,884,842

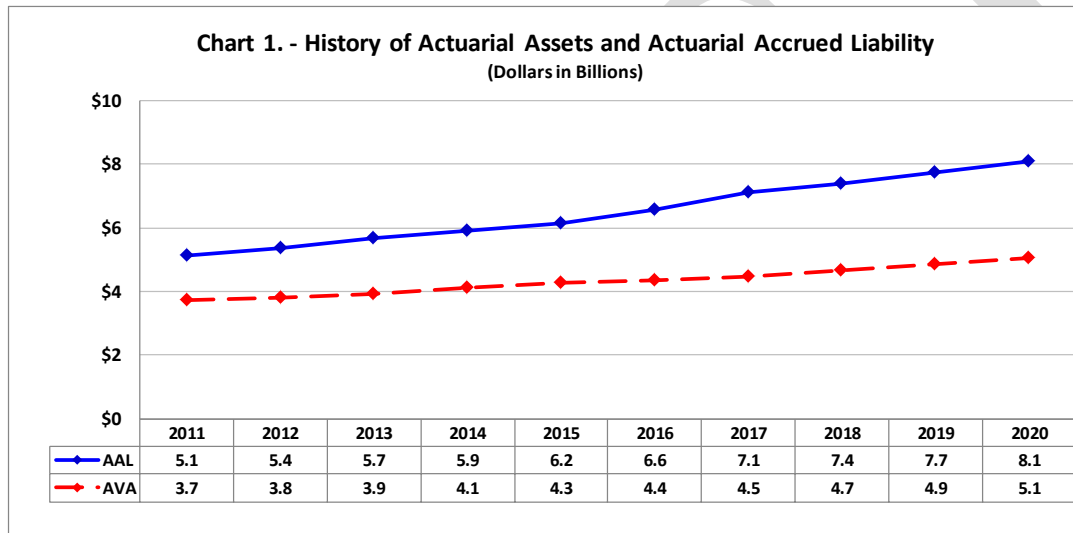
¹ The employer contribution rates in effect for FY 2020, FY 2021, and FY 2022 are 18.24%, 18.24%, and 19.24% of pay, respectively. These scheduled contribution rates was enacted by the Retirement System Funding and Administration Act of 2017, as amended by Act 135 of 2020. These contribution rates include the cost of accidental and incidental death benefits.

² The 20 year funding period shown for 2019 is based on the contribution rate schedule as modified by Act 135 of 2020. The funding period for 2020 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2022 (i.e. beginning July 1, 2021 and ending June 30, 2022).

Executive Summary (Continued)

The unfunded actuarial accrued liability increased by \$0.157 billion since the prior year's valuation to \$3.042 billion. The largest source of this increase is \$0.130 billion loss due to the recognition of deferred investment losses experienced in prior years in the actuarial value of assets.

Below is a chart with the System's historical actuarial value of assets and actuarial accrued liability. The increased difference in the actuarial value of assets and the actuarial accrued liability over the last 10 years has been due to a combination of: (i) the actual investment experience being less than the System's expected investment return assumption, (ii) assumption changes adopted in 2011, 2016, and again in 2017, and (iii) contributions that were less than the interest on the unfunded actuarial accrued liability.



The employer contribution rate is scheduled to increase from 18.24% of pay in fiscal year 2021 to 19.24% of pay in fiscal year 2022. State Statutes also specify that the employer contribution rate will increase by 1.00% for each of the next two subsequent fiscal years until attaining 21.24% of pay for fiscal year 2024. These scheduled increases in the employer contribution rate and the maximum amortization that is specified in state statute will, in time, result in improved financial security of the System.

To further strengthen the financial security of the plan in the event of adverse experience, State Statutes specifies that the maximum amortization period is 27 years as of July 1, 2020 and the maximum amortization period will decrease by one year in each of the next seven years until reaching a 20-year funding period on July 1, 2027. Finally, the Board is not permitted to decrease the employer and member contribution rates until the funded ratio of the plan is at least 85%.

SECTION B

DISCUSSION

Discussion

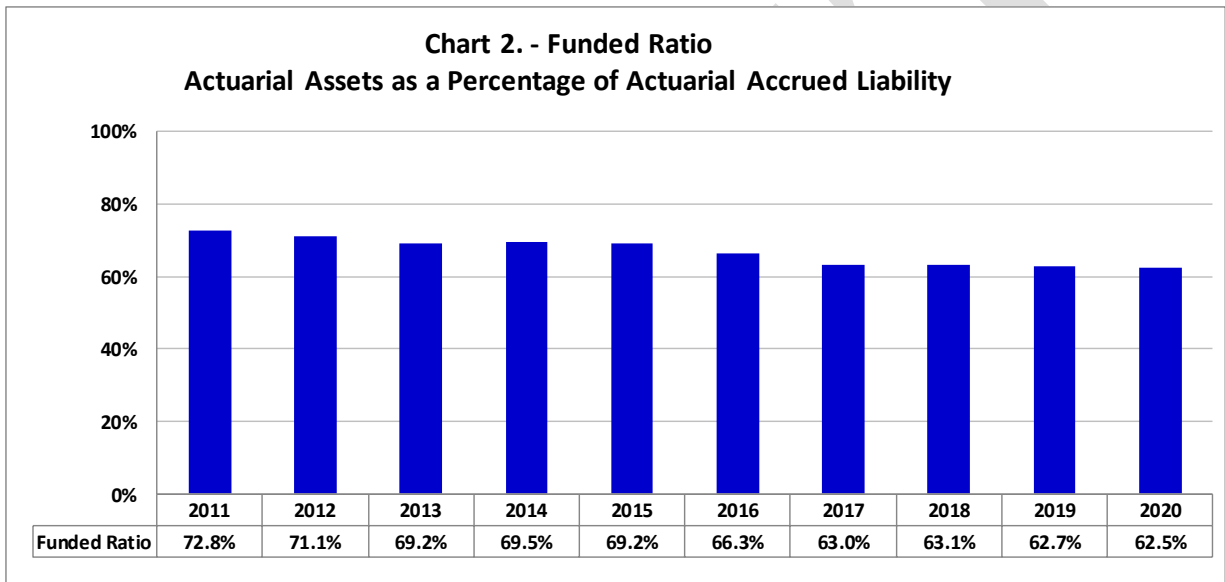
The results of the July 1, 2020 actuarial valuation of the Police Officers Retirement System are presented in this report. The primary purposes of the valuation report are to depict the current financial condition of the System and analyze changes in the System's financial condition. In addition, the report provides various summaries of the data.

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 Police Officers Retirement System.

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. Section E is new this year and provides an assessment and disclosure of risk as required by Actuarial Standards of Practice No. 51. 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 decreased from 62.7% to 62.5% since the prior valuation. Chart 2 shown below, provides a 10-year history of the System's funded ratio. This gradual decline in the funded ratio over the last 10 years has been due to a combination of: (i) the actual investment experience being less than the System's expected investment return assumption, (ii) assumption changes recommended by the actuary and adopted in 2011, 2016, and again in 2017, and (iii) contributions that were less than the interest on the unfunded actuarial accrued liability. The funded status of the System is shown in Table 10, Schedule of Funding Progress.

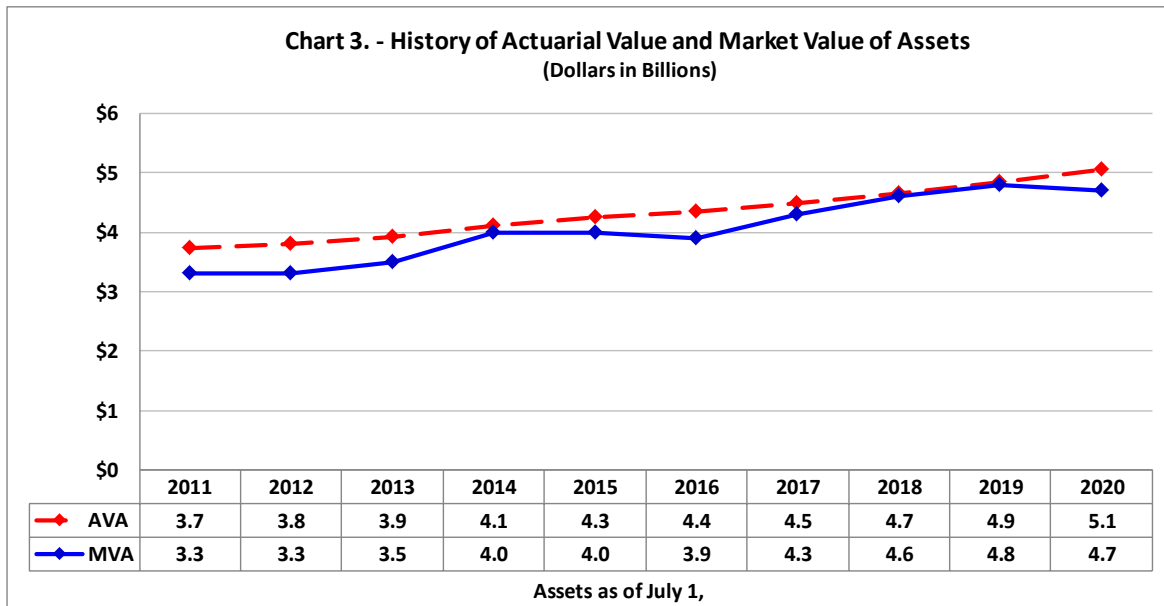


Absent future unfavorable investment or demographic experience, or legislative changes, we expect the funded ratio to begin to gradually improve. Also, based on the new funding policy and contribution rates, we expect the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, to gradually decrease.

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 increased from \$4.9 billion to \$5.1 billion since the prior valuation. Table 8 shows the development of the actuarial value of assets.

The rate of return on the market value of assets during the prior plan year was -1.6% on a dollar-weighted basis; the return on an actuarial (smoothed) asset value was 4.6%, which is below the 7.25% expected annual return. The difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method, meaning losses on market assets from previous years were initially deferred and ultimately recognized in this fiscal year, which in turn lowered the realized return on the smoothed asset value.



Tables 6 and 7 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 Funding Period

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 attempt to model what the experience will be for any one given fiscal year, but instead try to model the overall experience over many years. Therefore, as long as the actual experience of the retirement system is reasonably close to the current assumptions, the long-term funding requirements of the System will remain relatively consistent.

The unfunded actuarial accrued liability (UAAL) has increased from \$2.9 billion in 2019 to \$3.0 billion in 2020. 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	\$2,884,842
- Interest on UAAL	209,151
- Amortization payment	(229,602)
- Assumption/method changes	0
- Asset experience	130,430
- Salary experience	38,748
- Other liability experience	8,621
- Legislative changes	0
• End of Year UAAL	\$3,042,190

The following table reconciles the change in the funding period from the prior year's valuation based on the contribution rates that are currently in effect for fiscal year 2021 as well as the effect of the contribution rate increase that is scheduled for fiscal year 2022.

Change in Funding Period (Years)	
• 2019 Valuation and FY 2021 Contribution Rates ¹	20.2
- Expected experience	(1.0)
- Assumption and method changes	0.0
- Asset experience	1.4
- Salary and demographic experience	(0.3)
- Legislative changes	0.0
- Total Change	0.1
• 2020 Valuation and FY 2021 Contribution Rates	20.3
- Scheduled contribution rate increase in FY 2021	(1.9)
• 2020 Valuation and Scheduled FY 2022 Contribution Rates	18.4

¹ The funding period based on the 2019 valuation is based on the contribution rate schedule that was modified by Act 135 of 2020.

Actuarial Gains/ (Losses) and the Funding Period (Continued)

The employer contribution rate is established in accordance with Section 9-11-225 of the South Carolina Code, as amended by the Retirement System Funding and Administration Act of 2017. These scheduled contribution rates were amended by Act 135 in May 2020. The employer contribution rate scheduled to be in effect for the fiscal year ending June 30, 2022 is 19.24%. The employer contribution rate is also scheduled to increase by 1.00% of pay for each of the next two fiscal years until an ultimate employer contribution rate of 21.24% of pay is attained for fiscal year 2024.

The calculated funding period documented in this actuarial valuation only reflects the scheduled 19.24% employer contribution that is to become effective for the 2022 fiscal year (i.e. the fiscal year beginning July 1, 2021 and ending July 1, 2022).

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. The assumptions used in this actuarial valuation are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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.

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 PORS. There were no legislative changes enacted since the prior valuation that changed or modified the benefits that members earn or receive. Below is a summary of the retirement provisions for Class Two members- members hired prior to July 1, 2012, and Class Three members- members hired after June 30, 2012.

Summary of Retirement Provisions for:

Class Two Members (members hired prior to July 1, 2012)

- Average Final Compensation (AFC) is based on the highest twelve (12) consecutive quarters of compensation. The determination of a member's AFC also includes up to 45 days of unused annual leave paid at termination. Monthly benefits are based on one-twelfth of this amount.
- The retirement benefit is equal to 2.14% of the member's AFC times the member's credited service (years). Credited service may include up to 90 days of unused sick leave.
- Members are eligible to commence their retirement benefit after they have (i) 25 years of credited service or (ii) attained age 55 with 5 years of earned service.
- At each July 1 after their first full year of retirement, annuitants will receive a benefit adjustment equal to the lesser of 1.00% of their retirement benefit or \$500 per annum.

Class Three Members (members hired after June 30, 2012)

- Average Final Compensation (AFC) is based on the highest twenty (20) consecutive quarters of compensation. The determination of a member's AFC also will not include unused annual leave paid at termination. Monthly benefits are based on one-twelfth of this amount.
- The retirement benefit is equal to 2.14% of the member's AFC times the member's credited service (years). Credited service will not include unused sick leave.
- Members are eligible to commence their retirement benefit after they have (i) 27 years of credited service or (ii) attained age 55 with 8 years of earned service.
- At each July 1 after their first full year of retirement, annuitants will receive a benefit adjustment equal to the lesser of 1.00% of their retirement benefit or \$500 per annum.

SECTION C

ACTUARIAL TABLES

Actuarial Tables

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Summary of Cost Items
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Projected payroll of active members ¹	\$ 1,440,645	\$ 1,378,255
2. Present value of future pay ¹	\$ 10,816,625	\$ 10,270,009
3. Normal cost rate		
a. Total normal cost rate	14.47%	14.54%
b. Less: member contribution rate	-9.75%	-9.75%
c. Employer normal cost rate	4.72%	4.79%
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 4,675,138	\$ 4,443,076
b. Less: present value of future normal costs	1,528,263	1,458,349
c. Actuarial accrued liability	\$ 3,146,875	\$ 2,984,727
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	\$ 4,709,824	\$ 4,514,202
b. Inactive members	255,239	238,486
c. Active members (Item 4.c.)	3,146,875	2,984,727
d. Total	\$ 8,111,938	\$ 7,737,415
6. Actuarial value of assets	\$ 5,069,748	\$ 4,852,573
7. Unfunded actuarial accrued liability (UAAL) (Item 5.d. - Item 6.)	\$ 3,042,190	\$ 2,884,842
8. Required Contribution Rate		
a. Employer normal cost rate	4.72%	4.79%
b. Employer contribution rate available to amortize the UAAL	14.52%	14.45%
c. Total employer contribution rate	19.24%	19.24%
9. Funding period based on the required employer contribution rate (years) ²	18	20
10. Applicable statutorily required contribution rates ³		
a. Employer contribution rate	19.24%	18.24%
b. Member contribution rate	9.75%	9.75%

¹ The projected payroll does not include payroll for working retirees.

² The funding period for 2020 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2022 (i.e. beginning July 1, 2021 and ending June 30, 2022).

³ The actual employer contribution rates in effect for FY 2020, FY 2021, and FY 2022 are 18.24%, 18.24%, and 19.24% of pay, respectively. These contribution rates include the cost of accidental and incidental death benefits.

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

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Service retirement	\$ 3,762,293	\$ 3,575,145
b. Deferred termination benefits and refunds	399,211	379,655
c. Survivor benefits	103,424	97,883
d. Disability benefits	410,210	390,393
e. Total	\$ 4,675,138	\$ 4,443,076
2. Retired members		
a. Service retirement	\$ 3,771,380	\$ 3,602,333
b. Disability retirement	702,052	686,984
c. Beneficiaries	191,112	180,766
d. Incidental and accidental death benefits	45,280	44,119
e. Total	\$ 4,709,824	\$ 4,514,202
3. Inactive members		
a. Vested terminations	\$ 202,679	\$ 192,828
b. Nonvested terminations	52,560	45,658
c. Total	\$ 255,239	\$ 238,486
4. Total actuarial present value of future benefits	\$ 9,640,201	\$ 9,195,764

Analysis of Normal Cost

	<u>July 1, 2020</u> (1)	<u>July 1, 2019</u> (2)
1. Total normal cost rate		
a. Service retirement	8.66%	8.71%
b. Deferred termination benefits and refunds	3.95%	3.96%
c. Survivor benefits	0.32%	0.32%
d. Disability benefits	<u>1.42%</u>	<u>1.43%</u>
e. Total	14.35%	14.42%
2. Administrative expense	0.12%	0.12%
3. Less: member contribution rate	<u>9.75%</u>	<u>9.75%</u>
4. Net employer normal cost rate	4.72%	4.79%

Note: The normal cost includes the cost of accidental and incidental death benefits.

Results of July 1, 2020 Valuation
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)
1. Actuarial Present Value of Future Benefits	
a. Present retired members and beneficiaries	\$ 4,709,824
b. Present active and inactive members	4,930,377
c. Total actuarial present value	\$ 9,640,201
2. Present Value of Future Normal Contributions	
a. Member	\$ 1,054,621
b. Employer	473,642
c. Total future normal contributions	\$ 1,528,263
3. Actuarial Liability	\$ 8,111,938
4. Current Actuarial Value of Assets	\$ 5,069,748
5. Unfunded Actuarial Liability	\$ 3,042,190
6. <u>UAAL Amortization Rates based on an employer contribution rate of 19.24%</u>	
a. Active members	14.52%
b. Re-employed retirees (including employee contributions)	28.99%
7. Unfunded Actuarial Liability Liquidation Period	18 years

Note: The employer contribution rate includes the cost of accidental and incidental death benefits.

Actuarial Balance Sheet
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Assets		
a. Current assets (actuarial value)		
i. Employee annuity savings fund	\$ 1,265,088	\$ 1,179,539
ii. Employer annuity accumulation fund	3,804,660	3,673,034
iii. Total current assets	\$ 5,069,748	\$ 4,852,573
b. Present value of future member contributions	\$ 1,054,621	\$ 1,001,326
c. Present value of future employer contributions		
i. Normal contributions	\$ 473,642	\$ 457,023
ii. Accrued liability contributions	3,042,190	2,884,842
iii. Total future employer contributions	\$ 3,515,832	\$ 3,341,865
d. Total assets	\$ 9,640,201	\$ 9,195,764
2. Liabilities		
a. Employee annuity savings fund		
i. Past member contributions	\$ 1,265,088	\$ 1,179,539
ii. Present value of future member contributions	1,054,621	1,001,326
iii. Total contributions to employee annuity savings fund	\$ 2,319,709	\$ 2,180,865
b. Employer annuity accumulation fund		
i. Benefits currently in payment	\$ 4,709,824	\$ 4,514,202
ii. Benefits to be provided to other members	2,610,668	2,500,697
iii. Total benefits payable from employer annuity accumulation fund	\$ 7,320,492	\$ 7,014,899
c. Total liabilities	\$ 9,640,201	\$ 9,195,764

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

Item (1)	July 1, 2020 (2)	July 1, 2019 (3)
1. Cash and cash equivalents (operating cash)	\$ 536,560	\$ 391,292
2. Receivables	248,909	247,854
3. Investments		
a. Short-term securities	\$ 48,984	\$ 60,027
b. Fixed income (global)	576,508	688,338
c. Global public equity	2,098,875	1,734,692
d. Opportunistic	34,499	406,087
e. Alternative investments	1,609,513	1,513,660
f. Total investments	\$ 4,368,379	\$ 4,402,804
4. Securities lending cash collateral invested	\$ 3,094	\$ 6,158
5. Prepaid administrative expenses	111	554
6. Capital assets, net of accumulated depreciation	203	207
7. Total assets	\$ 5,157,256	\$ 5,048,869
8. Liabilities		
a. Due to other Systems	\$ 0	\$ 0
b. Accounts payable	383,449	190,916
c. Investment fees payable	1,178	1,722
d. Obligations under securities lending	3,094	6,158
e. Deferred retirement benefits	0	0
f. Due to Employee Insurance Program	1,447	1,435
g. Benefit payable	421	388
h. Other liabilities	37,492	32,441
i. Total liabilities	\$ 427,081	\$ 233,060
9. Total market value of assets available for benefits (Item 7. - Item 8.i.)	\$ 4,730,175	\$ 4,815,809
10. Asset allocation (investments) ¹		
a. Net invested cash	8.7%	9.9%
b. Fixed income	12.2%	14.3%
c. Public equities	44.4%	36.0%
d. Global tactical asset allocation	0.7%	8.4%
e. Alternative investments	34.0%	31.4%
f. Total investments	100.0%	100.0%

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, 2020	July 1, 2019
	(1)	(2)
1. Value of assets at beginning of year	\$ 4,815,809	\$ 4,570,431
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 151,835	\$ 144,747
ii. Employer contributions	263,145	237,834
iii. Nonemployer contributions	12,470	12,470
iv. Total	\$ 427,450	\$ 395,051
b. Income		
i. Interest, dividends, and other income	\$ 92,079	\$ 91,965
ii. Investment expenses	(34,890)	(49,311)
iii. Net	\$ 57,189	\$ 42,654
c. Net realized and unrealized gains (losses)	(136,295)	221,668
d. Total revenue	\$ 348,344	\$ 659,373
3. Expenditures for the year		
a. Disbursements		
i. Refunds	\$ 22,492	\$ 21,608
ii. Regular annuity benefits	405,790	387,227
iii. Other benefit payments	4,211	3,712
iv. Net transfers to other Systems	(984)	(1,148)
v. Total	\$ 431,509	\$ 411,399
b. Administrative expenses and depreciation	2,469	2,596
c. Total expenditures	\$ 433,978	\$ 413,995
4. Increase in net assets (Item 2.d.- Item 3.c.)	\$ (85,634)	\$ 245,378
5. Value of assets at end of year (Item 1. + Item 4.)	\$ 4,730,175	\$ 4,815,809
6. Net External Cash Flow		
a. Dollar amount	\$ (4,059)	\$ (16,348)
b. Percentage of market value	-0.1%	-0.3%

Development of Actuarial Value of Assets

(Dollar amounts expressed in thousands)

				Year Ending June 30, 2020		
1.	Actuarial value of assets at beginning of year	\$		4,852,573		
2.	Market value of assets at beginning of year	\$		4,815,809		
3.	Net new investments					
a.	Contributions	\$		427,450		
b.	Disbursements			(433,978)		
c.	Subtotal			(6,528)		
4.	Market value of assets at end of year	\$		4,730,175		
5.	Net earnings (Item 4. - Item 2. - Item 3.c.)	\$		(79,106)		
6.	Assumed investment return rate for fiscal year			7.25%		
7.	Expected return (Item 6. x (Item 2. + 1/2 Item 3.c.))	\$		348,910		
8.	Excess return (Item 5. - Item 7.)	\$		(428,016)		
9.	Excess return on assets as of June 30, 2020:					
	<u>Fiscal Year</u> <u>Ending June 30,</u> (1)	<u>Excess</u> <u>Return</u> (2)	<u>Percent</u> <u>Deferred</u> (3)	<u>Deferred</u> <u>Amount</u> (4)		
a.	2020	\$	(428,016)	80%	\$	(342,413)
b.	2019		(66,348)	60%		(39,809)
c.	2018		22,932	40%		9,173
d.	2017		167,381	20%		33,476
e.	2016		(321,987)	0%		0
f.	Total				\$	(339,573)
10.	Actuarial value of assets as of June 30, 2020 (Item 4. - Item 9.f.)	\$		5,069,748		
11.	Expected actuarial value as of June 30, 2020	\$		5,197,620		
12.	Asset gain (loss) for year (Item 10. - Item 11.)	\$		(127,872)		
13.	Asset gain (loss) as % of the actuarial value of assets			-2.5%		
14.	Ratio of actuarial value to market value			107.2%		

Estimation of Yields
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2020 (1)	July 1, 2019 (2)
1. Market value yield		
a. Beginning of year market assets	\$ 4,815,809	\$ 4,570,431
b. Contributions to fund during the year	427,450	395,051
c. Disbursements	(433,978)	(413,995)
d. Investment income (net of investment expenses)	<u>(79,106)</u>	<u>264,322</u>
e. End of year market assets	\$ 4,730,175	\$ 4,815,809
f. Estimated dollar weighted market value yield	-1.6%	5.8%
2. Actuarial value yield		
a. Beginning of year actuarial assets	\$ 4,852,573	\$ 4,654,193
b. Contributions to fund during the year	427,450	395,051
c. Disbursements	(433,978)	(413,995)
d. Investment income (net of investment expenses)	<u>223,703</u>	<u>217,324</u>
e. End of year actuarial assets	\$ 5,069,748	\$ 4,852,573
f. Estimated actuarial value yield	4.6%	4.7%

Schedule of Funding Progress
(Dollar amounts expressed in thousands)

July 1,	Actuarial Value of	Actuarial Accrued	Unfunded Actuarial	Funded Ratio	Annual Covered	UAAL as % of
(1)	Assets (AVA)	Liability (AAL)	Accrued Liability	(2)/(3)	Payroll ¹	Payroll (4)/(6)
(1)	(2)	(3)	(UAAL) (3) - (2)	(5)	(6)	(7)
2006	2,935,841	3,466,281	530,440	84.7%	931,815	56.9%
2007	3,160,240	3,730,544	570,304	84.7%	992,849	57.4%
2008	3,363,136	4,318,955	955,819	77.9%	1,060,747	90.1%
2009	3,482,220	4,564,111	1,081,891	76.3%	1,084,154	99.8%
2010	3,612,700	4,850,457	1,237,757	74.5%	1,076,467	115.0%
2011	3,728,241	5,122,501	1,394,260	72.8%	1,087,587	128.2%
2012	3,808,934	5,357,492	1,548,558	71.1%	1,019,241	151.9%
2013	3,922,041	5,663,756	1,741,715	69.2%	1,033,189	168.6%
2014	4,105,308	5,905,828	1,800,520	69.5%	1,076,885	167.2%
2015	4,266,794	6,162,095	1,895,301	69.2%	1,105,703	171.4%
2016	4,354,853	6,567,397	2,212,544	66.3%	1,187,195	186.4%
2017	4,480,894	7,109,612	2,628,718	63.0%	1,263,314	208.1%
2018	4,654,193	7,378,084	2,723,891	63.1%	1,306,961	208.4%
2019	4,852,573	7,737,415	2,884,842	62.7%	1,378,255	209.3%
2020	5,069,748	8,111,938	3,042,190	62.5%	1,440,645	211.2%

¹ Covered payroll does not include payroll attributable to working retirees.

Summary of Principle Assumptions and Methods

Below is a summary of the principle economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

Valuation date:	July 1, 2020
Actuarial cost method:	Entry Age Normal
Amortization method:	Level percentage of payroll
Amortization period for contribution rate:	27-year maximum, closed period ¹
Asset valuation method:	5-Year Smoothing
Actuarial assumptions:	
Investment rate of return ²	7.25%
Projected salary increases	3.50% to 9.50% (varies by service)
Inflation	2.25%
Post-retirement benefit adjustments ³	1.00%
Retiree mortality	The 2016 Public Retirees of South Carolina Mortality Table projected at Scale AA from the year 2016. Male rates are multiplied by 125% and female rates are multiplied by 111%.

¹ The employer and member contribution rates are determined in accordance with Section 9-11-225 of the South Carolina Code. For 2020, the funding period determined on an actuarial value of asset basis may not exceed 27 years. Contribution rates are not permitted to decrease until the ratio of the actuarial value of assets to the actuarial accrued liability is at least 85%.

² This is a prescribed assumption in Section 9-16-335 of South Carolina State Code.

³ The benefit increase is the lesser of 1.00% or \$500 annually.

Solvency Test
(Dollar amounts expressed in thousands)

July 1, (1)	Actuarial Accrued Liability			Valuation Assets (5)	Portion of Aggregate Accrued Liabilities Covered by Assets		
	Active Member Contributions (2)	Retirants & Beneficiaries (3)	Active & Inactive Members (Employer Financed) (4)		Active (6)	Retirants (7)	ER Financed (8)
2006	622,008	1,668,449	1,175,824	2,935,841	100.0%	100.0%	54.9%
2007	658,023	1,818,914	1,253,607	3,160,240	100.0%	100.0%	54.5%
2008	697,423	2,183,645	1,437,887	3,363,136	100.0%	100.0%	33.5%
2009	726,214	2,348,685	1,489,212	3,482,220	100.0%	100.0%	27.4%
2010	758,695	2,577,772	1,513,990	3,612,700	100.0%	100.0%	18.2%
2011	786,724	2,784,144	1,551,633	3,728,241	100.0%	100.0%	10.1%
2012	773,710	3,118,016	1,465,766	3,808,934	100.0%	97.3%	0.0%
2013	793,414	3,385,496	1,484,846	3,922,041	100.0%	92.4%	0.0%
2014	850,383	3,490,161	1,565,284	4,105,308	100.0%	93.3%	0.0%
2015	905,768	3,624,713	1,631,614	4,266,794	100.0%	92.7%	0.0%
2016	968,722	3,881,514	1,717,161	4,354,853	100.0%	87.2%	0.0%
2017	1,034,549	4,136,503	1,938,560	4,480,894	100.0%	83.3%	0.0%
2018	1,104,572	4,307,805	1,965,707	4,654,193	100.0%	82.4%	0.0%
2019	1,179,539	4,514,202	2,043,674	4,852,573	100.0%	81.4%	0.0%
2020	1,265,088	4,709,824	2,137,026	5,069,748	100.0%	80.8%	0.0%

SECTION D

MEMBERSHIP INFORMATION

Membership Information

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Summary of Membership Data

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Males	20,394	20,212
b. Females	7,401	7,185
c. Total members	27,795	27,397
d. Total annualized prior year pay	\$ 1,381,648,891	\$ 1,313,183,325
e. Average pay	\$ 49,709	\$ 47,932
f. Average age	39.5	39.4
g. Average service	9.8	9.8
h. Member contributions with interest	\$ 1,108,769,000	\$ 1,034,174,663
i. Average contributions with interest	\$ 39,891	\$ 37,748
2. Vested inactive members		
a. Number	2,781	2,806
b. Total annual deferred benefits	\$ 25,360,182	\$ 24,841,821
c. Average annual deferred benefit	\$ 9,119	\$ 8,853
3. Nonvested inactive members		
a. Number	16,030	15,138
b. Member contributions with interest	\$ 52,560,220	\$ 45,657,876
c. Average refund due	\$ 3,279	\$ 3,016
4. Service retirees		
a. Number	15,341	14,896
b. Total annual benefits	\$ 337,449,531	\$ 321,400,219
c. Average annual benefit	\$ 21,997	\$ 21,576
d. Average age at the valuation date	66.2	65.9
e. Average age at retirement date	55.2	55.2
5. Disabled retirees		
a. Number	2,773	2,743
b. Total annual benefits	\$ 59,642,775	\$ 58,132,359
c. Average annual benefit	\$ 21,508	\$ 21,193
d. Average age at the valuation date	56.9	56.2
e. Average age at retirement date	44.1	43.9
6. Beneficiaries		
a. Number	1,511	1,455
b. Total annual benefits	\$ 19,686,409	\$ 18,612,756
c. Average annual benefit	\$ 13,029	\$ 12,792
d. Average age at the valuation date	67.6	67.6

Summary of Contributing Membership Data
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active Members		
a. Number of State Employees	9,026	9,077
Total Annual Compensation	\$ 419,844	\$ 409,165
b. Number of Public School Employees	0	0
Total Annual Compensation	\$ 0	\$ 0
c. Number of Other Agency Employees	18,769	18,320
Total Annual Compensation	\$ 961,805	\$ 904,019
Total Number of Active Members	27,795	27,397
Total Annual Compensation	\$ 1,381,649	\$ 1,313,184
2. Rehired Retired Participants		
a. Number of State Employees	681	722
Total Annual Compensation	\$ 27,668	\$ 27,871
b. Number of Public School Employees	6	6
Total Annual Compensation	\$ 391	\$ 291
c. Number of Other Agency Employees	1,669	1,745
Total Annual Compensation	\$ 87,965	\$ 88,123
Total Number of Rehired Retired Members	2,356	2,473
Total Annual Compensation	\$ 116,024	\$ 116,285

Note: Total compensation is the annualized pay for the prior year.

Summary of Historical Active Membership

July 1, (1)	Number of Employers ² (2)	Active Members		Covered Payroll ¹		Average Annual Pay		Average Age (9)	Average Service (10)
		Number (3)	Percent Increase /(Decrease) (4)	Amount in Thousands (5)	Percent Increase /(Decrease) (6)	Amount (7)	Percent Increase /(Decrease) (8)		
2006	314	24,813	4.3%	931,815	9.5%	37,554	5.05%	N/A	N/A
2007	313	25,645	3.4%	992,849	6.6%	38,715	3.09%	N/A	N/A
2008	313	26,427	3.0%	1,060,747	6.8%	40,139	3.68%	N/A	N/A
2009	318	26,598	0.6%	1,084,154	2.2%	40,761	1.55%	39.6	8.4
2010	322	26,568	-0.1%	1,076,467	-0.7%	40,517	-0.60%	39.8	8.7
2011	356	26,650	0.3%	1,087,587	1.0%	40,810	0.72%	39.8	9.6
2012	325	26,179	-1.8%	1,019,241	-6.3%	38,934	-4.60%	39.6	9.5
2013	356	26,194	0.1%	1,033,189	1.4%	39,444	1.31%	39.5	9.4
2014	310	26,697	1.9%	1,076,885	4.2%	40,337	2.27%	39.5	9.5
2015	312	26,575	-0.5%	1,105,703	2.7%	41,607	3.15%	39.4	9.7
2016	313	26,651	0.3%	1,187,195	7.4%	44,546	7.06%	39.5	9.8
2017	332	27,056	1.5%	1,263,314	6.4%	46,693	4.82%	39.4	9.7
2018	333	27,093	0.1%	1,306,961	3.5%	48,240	3.31%	39.4	9.7
2019	336	27,397	1.1%	1,378,255	5.5%	50,307	4.28%	39.4	9.8
2020	340	27,795	1.5%	1,440,645	4.5%	51,831	3.03%	39.5	9.8

¹ Covered payroll does not include payroll attributable to members in working retirees.

² Number of employers and agencies that cover employees earning benefits in PORS and that contributed to the system during the last fiscal year.

Distribution of Active Members by Age and by Years of Service

Attained Age	Years of Credited Service												Total Count & Avg. Comp.
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	
Under 20	44 \$29,841	12 \$33,538	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	56 \$30,633
20-24	841 \$32,544	516 \$38,366	308 \$40,720	112 \$42,113	65 \$42,944	37 \$44,051	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1,879 \$36,640
25-29	765 \$33,525	665 \$39,850	752 \$42,575	667 \$44,466	579 \$46,419	917 \$47,883	28 \$45,817	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	4,373 \$42,509
30-34	422 \$33,724	399 \$41,397	389 \$43,530	377 \$44,432	365 \$46,489	1,845 \$49,588	709 \$53,978	25 \$55,605	0 \$0	0 \$0	0 \$0	0 \$0	4,531 \$46,911
35-39	248 \$34,035	221 \$42,255	205 \$43,314	224 \$45,571	189 \$47,483	910 \$50,790	1,402 \$55,149	564 \$57,162	24 \$56,311	0 \$0	0 \$0	0 \$0	3,987 \$50,908
40-44	187 \$34,488	156 \$42,194	144 \$44,458	136 \$45,440	132 \$48,211	527 \$49,752	772 \$54,979	948 \$59,087	529 \$62,419	19 \$58,399	0 \$0	0 \$0	3,550 \$53,742
45-49	154 \$36,549	140 \$47,077	148 \$46,202	106 \$46,419	96 \$47,004	456 \$50,414	542 \$53,181	598 \$56,921	1,093 \$62,932	316 \$67,586	23 \$68,572	0 \$0	3,672 \$56,117
50-54	106 \$34,806	118 \$47,271	110 \$45,859	93 \$44,481	77 \$49,634	347 \$48,860	399 \$52,822	397 \$55,060	556 \$61,470	508 \$67,366	118 \$70,760	1 \$66,795	2,830 \$56,175
55-59	80 \$37,083	75 \$44,986	65 \$43,533	74 \$45,950	55 \$49,887	241 \$47,261	303 \$51,503	202 \$55,465	276 \$56,497	165 \$61,397	122 \$70,219	35 \$84,225	1,693 \$53,604
60-64	40 \$38,139	31 \$43,095	43 \$42,382	39 \$46,842	23 \$38,577	143 \$47,884	138 \$47,690	102 \$55,806	97 \$54,567	81 \$58,756	49 \$58,404	37 \$79,736	823 \$51,498
65 & Over	12 \$42,764	9 \$34,263	24 \$43,188	11 \$36,245	8 \$42,602	95 \$48,278	79 \$52,011	43 \$56,517	46 \$57,438	33 \$67,717	25 \$49,356	16 \$67,414	401 \$52,151
Total	2,899 \$33,727	2,342 \$41,129	2,188 \$43,119	1,839 \$44,697	1,589 \$46,747	5,518 \$49,336	4,372 \$53,868	2,879 \$57,266	2,621 \$61,374	1,122 \$65,787	337 \$67,030	89 \$79,141	27,795 \$49,709



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	9,389	\$ 201,756,926	\$ 1,791
100% J&S	3,291	69,915,549	1,770
50% J&S	1,943	50,560,212	2,168
Level Income	718	15,216,844	1,766
Subtotal:	15,341	\$ 337,449,531	1,833
Disability:			
Maximum	2,126	\$ 47,453,271	\$ 1,860
100% J&S	421	7,246,357	1,434
50% J&S	226	4,943,147	1,823
Subtotal:	2,773	\$ 59,642,775	1,792
Beneficiaries:	1,511	\$ 19,686,409	\$ 1,086
Total:	19,625	\$ 416,778,715	\$ 1,770

Distribution of Annuitants by Monthly Benefit

Monthly Benefit Amount				Number of Annuitants	Female	Male	Average Service
(1)				(2)	(3)	(4)	(5)
Under \$200				877	415	462	1.88
\$	200	-	399	1,198	535	663	6.94
	400	-	599	1,336	560	776	8.66
	600	-	799	1,360	638	722	11.15
	800	-	999	1,250	519	731	12.95
	1,000	-	1,199	1,250	501	749	14.57
	1,200	-	1,399	1,180	436	744	16.30
	1,400	-	1,599	1,113	378	735	18.56
	1,600	-	1,799	1,175	354	821	19.91
	1,800	-	1,999	1,246	294	952	21.30
	2,000	-	2,199	1,232	273	959	22.22
	2,200	-	2,399	1,124	228	896	23.15
	2,400	-	2,599	995	184	811	23.67
	2,600	-	2,799	840	125	715	24.47
	2,800	-	2,999	742	118	624	24.79
	3,000	-	3,199	526	71	455	25.94
	3,200	-	3,399	420	69	351	26.09
	3,400	-	3,599	328	47	281	26.73
	3,600	-	3,799	304	33	271	27.48
	3,800	-	3,999	251	29	222	27.75
	4,000	-	4,199	179	24	155	28.58
	4,200	-	4,399	145	22	123	28.81
	4,400	-	4,599	116	16	100	29.56
	4,600	-	4,799	98	7	91	29.83
	4,800	-	4,999	66	3	63	31.61
	5,000	-	5,499	122	16	106	31.25
	5,500	-	5,999	72	9	63	33.06
	6,000	-	6,499	30	2	28	34.60
	6,500	-	6,999	24	1	23	33.00
	7,000	-	7,499	10	1	9	34.90
	7,500	-	7,999	3	0	3	38.00
	8,000	&	Over	13	1	12	32.69
Total				19,625	5,909	13,716	17.94

Average age at retirement for service retirees as of July 1, 2020 is age 55.2.



Distribution of Average Annual Benefit by Age and Employee Type

Current Age (1)	State		Other		Total	
	Number of Annuitants	Average Annual Benefit Amount	Number of Annuitants	Average Annual Benefit Amount	Number of Annuitants	Average Annual Benefit Amount
	(4)	(5)	(6)	(7)	(8)	(9)
Under 40	77	\$ 11,784	161	\$ 15,729	238	\$ 14,453
40 - 44	71	18,460	191	24,029	262	22,520
45 - 49	202	23,332	534	25,220	736	24,702
50 - 54	571	25,274	1,133	27,604	1,704	26,823
55 - 59	1,203	22,685	1,803	25,984	3,006	24,663
60 - 64	1,572	20,100	1,921	23,723	3,493	22,093
65 - 69	1,877	18,684	1,768	21,464	3,645	20,032
70 - 74	1,564	18,301	1,539	20,323	3,103	19,304
75 - 79	747	15,747	1,050	18,530	1,797	17,373
80 - 84	293	14,329	676	18,706	969	17,382
85 - 89	55	16,666	428	17,500	483	17,405
90 And Over	4	12,078	185	15,164	189	15,099
Total	8,236	\$ 19,532	11,389	\$ 22,470	19,625	\$ 21,237

Schedule of Retirants Added to And Removed from Rolls

(Dollar amounts except average allowance expressed in thousands)

Year Ending June 30, (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 (3)	Number (4)	Annual Benefits (5)	Number (6)	Annual Benefits (7)		
2006	678	16,880	205	2,691	10,134	174,945	8.8%	17,263
2007	772	16,474	205	2,745	10,701	188,674	7.8%	17,631
2008	779	17,458	194	2,691	11,286	203,441	7.8%	18,026
2009	931	17,937	267	3,879	11,950	217,499	6.9%	18,201
2010	943	21,877	327	5,000	12,566	234,376	7.8%	18,652
2011	1,042	22,580	250	2,970	13,358	253,986	8.4%	19,014
2012	1,566	34,086	271	4,143	14,653	283,929	11.8%	19,377
2013	1,278	27,584	314	5,106	15,617	306,407	7.9%	19,620
2014	818	16,881	332	5,650	16,103	317,638	3.7%	19,725
2015	968	19,767	362	6,076	16,709	331,329	4.3%	19,829
2016	928	19,940	349	5,394	17,288	345,874	4.4%	20,007
2017	987	22,709	388	6,662	17,887	361,921	4.6%	20,234
2018	983	24,066	379	6,621	18,491	379,365	4.8%	20,516
2019	990	25,450	387	6,670	19,094	398,145	5.0%	20,852
2020	954	25,840	423	7,207	19,625	416,779	4.7%	21,237

Annual benefits added to rolls includes the benefit adjustments for continuing retirees.

SECTION E

ASSESSMENT AND DISCLOSURE OF RISK

Risks Associated with Measuring the Accrued Liability And Actuarially Determined Contribution

(As Required by ASOP No. 51)

The determination of PORS's accrued liability, actuarially determined contribution, and calculated funding period requires the use of assumptions regarding future economic and demographic experience. The risk measures illustrated in this section are intended to aid stakeholders in understanding the effects when future experience differs from the assumptions used in performing an actuarial valuation. These risk measures may also help with illustrating the potential volatility in the funded status and actuarially determined contributions that result from differences between actual experience and the expected experience based on the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience (economic and demographic) differing from the assumptions, changes in assumptions due to changing conditions, changes in contribution requirements due to modifications to the funding policy, and changes in the liability and cost due to changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risks that may reasonably be anticipated to significantly affect the System's future financial condition include:

- Investment risk – actual investment returns may differ from expected returns;
- Longevity risk – members may live longer or shorter than expected and receive pensions for a time period different than assumed;
- Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liabilities and contributions differing from expected;
- Salary and payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liabilities and contributions differing from expected;
- Asset/Liability mismatch – changes in assets may be inconsistent with changes in liabilities, thereby altering the relative difference between the assets and liabilities, which may alter the funded status and contribution requirements;
- Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions are not made in accordance with the System's funding policy or Statute, other anticipated payments to the plan are not made, or material changes occur in the anticipated number of covered employees, covered payroll, or another relevant contribution base.

On the other hand, effects of certain experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate of return, the funded status of the plan can be expected to decrease (or increase) more than anticipated.

The contribution rate in this report was established in accordance with Section 9-11-255 of the South Carolina Code, as amended by the Retirement System Funding and Administration Act of 2017. These scheduled contribution rates were amended by Act 135 of 2020. However, stakeholders should be aware that the scheduled contribution rates specified in State Code do not necessarily guarantee that the contribution requirements will not increase in a future year.

Employer Risk with Contribution Rates

The funding policy, as last amended by the Retirement System Funding and Administration Act of 2017 (and amended by Act 135), is intended to finance the unfunded actuarial accrued liability over a reasonable time period and provide stability in the employer contribution rates so employers are better able to budget their pension cost in future years. The greater the difference between the calculated funding period based on the contribution rate specified in State Code and the maximum specified funding period, the greater the ability for the System to incur some adverse experience without requiring an increase in the employer contribution rate.

However, providing stability in the contribution rates means that projecting the year the fund actually attains a 100% funded ratio becomes less certain. If actual experience is more favorable than assumed, then the year the fund attains a 100% funded ratio will be earlier than projected, but the projected year the fund attains a 100% funded ratio will be later than projected if actual experience is less favorable than assumed.

Plan Maturity Measures

Risks faced by a pension plan evolve over time. A relatively new plan with virtually no assets and paying few benefits will experience lower investment risk than a mature plan with a significant amount of assets and large number of members receiving benefits. There are a few measures that can assist stakeholders in understanding and comparing the maturity of a plan to other systems, which include:

- Ratio of market value of assets to payroll: The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. If assets are approximately the same as covered payroll, an investment return that is 5% different than assumed would equal 5% of payroll. In another example, if the assets are approximately twice as large as covered payroll, an investment return that is 5% different than assumed would equal 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.
- Ratio of actuarial accrued liability to payroll: The ratio of actuarial accrued liability to payroll can be used as a measure to indicate the potential volatility of contributions due to volatility in the liability experience. For instance, if the actuarial accrued liability is 5 times the size of the covered payroll, then a change in the liability that is 2% different than expected would be a change in magnitude that is 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.

- Ratio of active to retired members: A relatively mature open plan is likely to have close to the same number of actives to retirees resulting in a ratio that is around 1.0. On the other hand, a super-mature plan, or a plan that is closed to new entrants will have more retirees than active members resulting in a ratio below 1.0. As this ratio declines, a larger portion of the total actuarial accrued liability in the System is attributable to retirees. This metric also typically moves in tandem with the liability to payroll metric, which provides an indication of potential contribution volatility.
- Ratio of net cash flow to market value of assets: A negative net cash flow means that benefit payments exceed contributions and the plan is depending on investment earnings and possibly existing funds to make payments to retirees. A certain amount of negative net cash flow is expected to occur when benefits are prefunded and the plan has matured. However, a relatively large negative net cash flow as a percent of assets may be an indication of the need for additional contributions for a plan with a low funded ratio.

The following exhibit provides a summary of these measures for PORS. We have also included these metrics for the prior four years so stakeholders can identify how these measures are trending.

Measure	July 1,				
	2020	2019	2018	2017	2016
Ratio of the market value of assets to total payroll	3.04	3.22	3.21	3.09	2.95
Ratio of actuarial accrued liability to payroll	5.21	5.18	5.18	5.13	5.00
Ratio of actives to retirees and beneficiaries	1.42	1.43	1.47	1.51	1.54
Ratio of net cash flow to market value of assets	-0.1%	-0.3%	-0.7%	-1.3%	-1.8%

Note: For purposes of this analysis, payroll includes the payroll received by working retirees since the System receives contributions on that payroll.

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 South Carolina Police Officers Retirement System.

Investment Rate of Return

Assumed annual rate of 7.25% 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

Rates of annual salary increase are assumed to vary for the first 15 years of service to include anticipated merit and promotional increases. The assumed annual rate of increase is 3.50% for all members with 15 or more years of service.

The 3.50% rate of increase is composed of a 2.25% inflation component and a 1.25% real rate of wage increase (productivity) component.

Active Male & Female Salary Increase Rate		
Years of Service	PORS	
	Annual Promotional/Longevity Rates of Increase	Total Annual Rate of Increase Including 3.50% Wage Inflation
1	6.00%	9.50%
2	5.50%	9.00%
3	3.00%	6.50%
4	1.50%	5.00%
5	1.25%	4.75%
6	1.00%	4.50%
7	1.00%	4.50%
8	0.75%	4.25%
9	0.75%	4.25%
10	0.50%	4.00%
11	0.50%	4.00%
12	0.50%	4.00%
13	0.50%	4.00%
14	0.25%	3.75%
15	0.00%	3.50%
16	0.00%	3.50%
17	0.00%	3.50%
18	0.00%	3.50%
19	0.00%	3.50%
20+	0.00%	3.50%

Active Member Decrement Rates

- a. Assumed rates of Service Retirement are shown in the following tables. The first table is for members who attain age 55 before attaining 25 years of service (27 years of service for Class Three Members). The second table is based on service and is for members who attain 25 years of service (27 years of service for Class Three Members) before age 55.

Annual Age Based Retirement Rates																																																																															
Age	PORS																																																																														
	Male	Female																																																																													
55	20%	20%	<table><tr><th colspan="4">Annual Service Based Retirement Rates</th></tr><tr><th colspan="2">Years of Service</th><th colspan="2">PORS</th></tr><tr><th>Class Two</th><th>Class Three</th><th>Male</th><th>Female</th></tr><tr><td>25</td><td>27</td><td>40%</td><td>40%</td></tr><tr><td>26</td><td>28</td><td>10%</td><td>10%</td></tr><tr><td>27</td><td>29</td><td>10%</td><td>10%</td></tr><tr><td>28</td><td>30</td><td>10%</td><td>10%</td></tr><tr><td>29</td><td>31</td><td>10%</td><td>10%</td></tr><tr><td>30</td><td>32</td><td>10%</td><td>10%</td></tr><tr><td>31</td><td>33</td><td>10%</td><td>10%</td></tr><tr><td>32</td><td>34</td><td>10%</td><td>10%</td></tr><tr><td>33</td><td>35</td><td>10%</td><td>10%</td></tr><tr><td>34</td><td>36</td><td>10%</td><td>10%</td></tr><tr><td>35</td><td>37</td><td>10%</td><td>10%</td></tr><tr><td>36</td><td>38</td><td>10%</td><td>10%</td></tr><tr><td>37</td><td>39</td><td>10%</td><td>10%</td></tr><tr><td>38</td><td>40</td><td>10%</td><td>10%</td></tr><tr><td>39</td><td>41</td><td>10%</td><td>10%</td></tr><tr><td>40</td><td>42</td><td>100%</td><td>100%</td></tr></table>	Annual Service Based Retirement Rates				Years of Service		PORS		Class Two	Class Three	Male	Female	25	27	40%	40%	26	28	10%	10%	27	29	10%	10%	28	30	10%	10%	29	31	10%	10%	30	32	10%	10%	31	33	10%	10%	32	34	10%	10%	33	35	10%	10%	34	36	10%	10%	35	37	10%	10%	36	38	10%	10%	37	39	10%	10%	38	40	10%	10%	39	41	10%	10%	40	42	100%	100%
Annual Service Based Retirement Rates																																																																															
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Class Two	Class Three	Male		Female																																																																											
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- b. Assumed rates of disability are shown in the following table. 25% of disabilities are assumed to be duty-related.

Disability Rates		
Age	PORS	
	Males	Females
25	0.1740%	0.1740%
30	0.2320%	0.2320%
35	0.4350%	0.4350%
40	0.5800%	0.5800%
45	0.8700%	0.8700%
50	1.0875%	1.0875%
55	0.0000%	0.0000%
60	0.0000%	0.0000%
64	0.0000%	0.0000%

c. Active Member Mortality

Rates of active member mortality are based upon the RP-2014 Mortality Table for Employees with applicable multipliers to better reflect anticipated experience and provide margin for future improvement in mortality.

Active Mortality Rates (Multiplier Applied)		
Age	PORS	
	Males	Females
25	0.0460%	0.0164%
30	0.0429%	0.0207%
35	0.0497%	0.0272%
40	0.0597%	0.0376%
45	0.0924%	0.0624%
50	0.1602%	0.1047%
55	0.2649%	0.1589%
60	0.4454%	0.2320%
64	0.7008%	0.3220%
Multiplier	95%	95%

For purposes of determining active death benefits, 5% of active deaths for general employees are assumed to be duty related.

d. Rates of Withdrawal

Rates of withdrawal are service related. Sample rates are shown in the tables below.

Years of Service	Annual Withdrawal Rate	
	PORS	
	Male	Female
0	25.00%	25.00%
1	18.00%	18.00%
2	14.00%	14.00%
3	12.00%	12.00%
4	10.70%	10.70%
5	9.54%	9.54%
6	8.50%	8.50%
7	7.58%	7.58%
8	6.75%	6.75%
9	6.02%	6.02%
10	5.37%	5.37%
11	4.78%	4.78%
12	4.26%	4.26%
13	3.80%	3.80%
14	3.39%	3.39%
15	3.02%	3.02%
16	2.69%	2.69%
17	2.40%	2.40%
18	2.14%	2.14%
19	1.91%	1.91%
20	1.70%	1.70%
21	1.51%	1.51%
22	1.35%	1.35%
23	1.20%	1.20%

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. Future mortality improvements are assumed each year using Scale AA from the year 2016 and multipliers applied to the base table to appropriately fit with plan experience. The following are sample rates:

Nondisabled Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	PORS	
	Males	Females
50	0.2548%	0.1454%
55	0.4006%	0.2465%
60	0.7329%	0.4265%
65	1.2748%	0.5924%
70	1.9648%	0.9640%
75	3.3994%	1.8534%
80	6.3116%	3.7276%
85	11.4493%	7.0538%
90	19.8803%	12.3489%
Multiplier	125%	111%

Life Expectancy for an Age 65 Retiree in Years				
Member	Year of Retirement			
	2020	2025	2030	2035
Male	18.9	19.3	19.7	20.0
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 with multipliers applied to appropriate fit to plan experience. The following are sample rates:

Disabled Annuitant Mortality Rates (Multiplier Applied)		
Age	PORS	
	Males	Females
50	1.7336%	1.0121%
55	1.9864%	1.2307%
60	2.2613%	1.4449%
65	2.6932%	1.7731%
70	3.4294%	2.3973%
75	4.6144%	3.4888%
80	6.5124%	5.1881%
85	9.6308%	7.6857%
90	14.7054%	11.2754%
Multiplier	85%	85%

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 percent of payroll 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.

Development of the Contribution Rate and Funding Period

The calculation of the employer and member contribution rate as well as the derived funding period takes into account a couple differences in contributions paid by the various members as well as the delayed timing (if any) in the effective date of the new contribution rate. Specifically, the factors that are reflected in the calculation of the contribution rate include:

- 1) Member and employer contributions made on the payroll of working retirees are being used to finance the unfunded actuarial accrued liability since these members do not have a normal cost. Also, the number of working retirees is expected to decrease due to changes in working after retirement provisions enacted with the 2012 legislative changes.
- 2) For purposes of calculating the amortization cost and funding period, discrete pay increases and continuous interest was assumed, with amortization payments made at the end of each month.

Unused Annual Leave

To account for the effect of unused annual leave in Average Final Compensation (AFC) of Class Two members, the AFC for Class Two members is increased 3.75% at their projected date of termination or retirement. Unused annual leave is not included in the calculation of the AFC for Class Three members.

Unused Sick Leave

To account for the effect of unused sick leave on credited service for Class Two members, the service of active Class Two members who retire is increased 3 months. Unused sick leave is not included in determining the credited service for Class Three members.

Future Post-Retirement Benefit Adjustments

Benefits are assumed to increase by the lesser of 1.00% annually or \$500 beginning on the July 1st following the receipt of 12 monthly benefit payments. The \$500 limit in the annual increase is not indexed to escalate in future years.

Payroll Growth Rate

The total annual payroll of all contributing members is assumed to increase at an annual rate of 3.00%.

Other Assumptions

1. Valuation payroll (used for determining the amortization contribution rate): Prior fiscal year payroll projected forward one year using the overall payroll growth rate. This was determined separately for active employees and return to work employees by dividing the actual member contributions received during the prior fiscal year by the applicable member contribution rate for that fiscal year, and then projecting forward at 3.00%.
2. Individual salaries used to project benefits: Actual salaries from the past fiscal year are used to determine the final average salary as of the valuation date. For future salaries, the salary from the last fiscal year is projected forward with one year's salary scale.
3. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported salaries represent amounts paid to members during the year ended on the valuation date.
4. Percent married: 100% of male and 100% of female employees are assumed to be married.
5. Age difference: Males are assumed to be four years older than their spouses.
6. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.
7. Inactive Population: All non-vested members are assumed to take an immediate refund. Vested benefit are assumed to elect a refund or a deferred benefit commencing at age 65, whichever is more valuable at the valuation date
8. There will be no recoveries once disabled.
9. Decrement timing: Decrements of all types are assumed to occur mid-year.
10. 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.

11. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
12. Incidence of contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
13. Benefit service: All members are assumed to accrue one year of service each year.
14. All calculations were performed without regard to the compensation limit in IRC Section 401(a)(17) and the benefit limit under IRC Section 415.

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 Police Officers Retirement System (PORS)

Effective Date: July 1, 1962.

Administration: The South Carolina Retirement System, organizationally aligned as a Division of 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. Under GASB Statement Nos. 27, 67 and 68, it is considered to be a cost-sharing multiple-employer plan.

Eligibility: This System covers police officers and firefighters employed by the state, and any participating political subdivision, agency, or department of the state. With the exception for magistrates and probate judges, eligible public safety employees must earn at least \$2,000 per year and devote at least 1,600 hours per year, unless exempted by statute.

Employee Contributions: Members are contributing 9.75% of earnable compensation on and after July 1, 2017. These contributions are "picked-up" under Section 414(h) of the Internal Revenue Code. Contributions are credited with interest at the rate of 4.0% per annum while the member is active. Members do not earn interest on their employee contribution account balance while they are inactive.

Average Final Compensation (AFC): The monthly average of the member's highest twelve (12) consecutive quarters of earnable compensation (20 consecutive quarters for Class Three members, members who are hired after June 30, 2012). Earnable compensation is the compensation that would be payable to a member if the member worked a full, normal working time, which includes gross salary, overtime, sick pay, and deferrals. The calculation of a Class Two member's AFC also includes up to 45 days pay for unused annual leave paid at termination.

Members joining the System after January 1, 1996, have their compensation limited in accordance with IRC Section 401(a)(17) for determining benefits.



Service Retirement:

- a. Eligibility: A Class Two member may retire with an unreduced benefit at age 55 or after 25 years of creditable service, if earlier. The member must also have a minimum of 5 years of “earned” service to qualify for retirement. Class Three members may retire with an unreduced benefit at age 55 or after 27 years of creditable service, if earlier. Class Three members must also have a minimum of 8 years of “earned” service to qualify for retirement.
- b. Monthly Benefit: 2.14% times Average Final Compensation (AFC) times years of creditable service. Class Two members will receive service credit for up to 90 days of unused sick leave where twenty days of sick leave constitutes one month of service credit.
- c. Payment Form: Maximum retirement allowance (Option A) and survivor allowances under Options B and C.

Disability Retirement:

- a. Eligibility: Member must have five or more years of earned service (8 years for Class Three members), unless the disability is due to performing his or her job duties.
- b. Monthly Benefit:
The monthly benefit is equal to the member’s service retirement benefit that would have been payable based on the member’s AFC determined as of the date of his disability and a projected credited service amount that assumes the member continued employment to age 55, not to exceed their current service or 25 years. However, a member must receive a disability retirement allowance equal to at least 15% of his AFC.
- c. Payment Form: Maximum retirement allowance (Option A) and survivor allowances under Options B and C.
- 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. Class Two members are vested after five years of earned service. Class Three members are vested after eight years of earned 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 (i.e. five years of earned service for Class Two members and eight years of earned service for Class Three members) and must elect to leave his/her contributions on deposit.
- b. Monthly Benefit: Same as the unreduced or reduced service retirement benefit, based on service and AFC at termination, and commencing once the member is eligible.
- c. Payment Form: Maximum retirement allowance (Option A) and survivor allowances under Options B and C.
- 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). In accordance with administrative policy, if the member met service eligibility requirements at their time of death, the beneficiary is eligible for a monthly survivor annuity benefit.

Death while an Active Member:

Members who die while actively employed will receive the regular death benefit described below. If the member was an employee of an employer participating in the Accidental Death Benefit Program and/or the Preretirement Death Benefit Program, then the beneficiary will receive additional death benefits.

Regular Death Benefit:

- a. Refund: In the event of the death of an active member (duty or non-duty related), a refund of the member's accumulated contributions (with interest), subject to a minimum refund of \$1,000, is paid to the beneficiary of a deceased member.
- b. Beneficiary Annuity: If the deceased member (i) has 5 or more years of earned service and (ii) attained age 55 or 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 determined under "Option B" described under the Optional Forms of Benefit. For purposes of the benefit calculation, a member under the age of 55 is assumed to be 55 years of age.

Accidental Death Benefit Program:

The statutory beneficiary (i.e. surviving spouse, child, or parent of the member) of an active employee of an employer participating in the Accidental Death Benefit Program who dies as a result of a duty related event is entitled to the following beneficiary annuity.

- a. Beneficiary Annuity: In the event a member dies as a result of a duty related event, a monthly benefit is payable for the lifetime of the member's spouse or parent (or a child until age 18) equal to 50% of the member's compensation at the time of death.

Optional Forms of Benefit: The System permits members to elect from three forms of benefit at retirement. In each case the benefit amount is adjusted to be actuarially equivalent to the "Option A" form. The optional forms are:

- a. Option A (Maximum Retirement Allowance): A life annuity. Upon the member's death, any remaining member contributions will be paid to the member's designated beneficiary.
- b. Option B (100% Joint & Survivor with Pop-up): 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 retirement allowance (Option A), plus any applicable benefit adjustments that would have been granted.
- c. Option C (50% Joint & Survivor with Pop-up): 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 retirement allowance (Option A), plus any applicable benefit adjustments that would have been granted.

Incidental Death Benefit:

- a. Active Employees: The beneficiary (or estate) of an active employee of an employer participating in the Preretirement Death Benefit Program 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.

For purposes of determining eligibility for incidental death benefits, active employees include those members who are actively reemployed and contributing as a working retiree with a participating employer.

- 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 if the employer was participating in the Preretirement Death Benefit Program at the time of the retired member's death. The amount of the one-time payment is based on the retiree's years of credited service at retirement.

Years of Service Credit	Death Benefit
10 or more, but less than 20	\$2,000
20 or more, but less than 25	\$4,000
25 or more	\$6,000

Postretirement Benefit Increases: Benefits paid to retired members or surviving spouses are increased annually in an amount equal to the lesser of 1.00% of the pension benefit or \$500 beginning on the July 1st following the receipt of 12 monthly benefit payments. The \$500 limit in the annual increase is not indexed to escalate in future years.

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.

Decrements: 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 Statement Nos. 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 may not decrease by exactly one year in the subsequent year's actuarial valuation. In some instances, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In other instances, the amortization period may "float" from year to year, meaning it could increase, decrease, or remain relatively unchanged from the amortization period in the prior year's valuation.

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.

DRAFT

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

Actuarial Valuation Report
as of July 1, 2020





November 24, 2020

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

Subject: Actuarial Valuation as of July 1, 2020

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, 2020 actuarial valuation was certified to be the employer contribution amount for the fiscal year beginning July 1, 2021. 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 7 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 48.8% to 51.6% since the last actuarial valuation primarily due to the State's contribution effort to finance the unfunded liability. 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 remain unchanged at 48.2%.

Plan assets earned a -1.58% return on a time weighted-basis (net of fees) as reported in the financial statement of the South Carolina Retirement Systems for the year ending June 30, 2020. The -1.3% return documented in this report was determined on a dollar-weighted basis and assumes mid-year cash flows. This return resulted in the market value of assets being \$2,966 thousand less than expected based on the 7.25% investment return assumption.

ASSUMPTIONS AND METHODS

There were no assumption changes since the prior actuarial valuation. These assumptions are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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.

This report was prepared using our proprietary valuation model and related software, which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2020. 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, 2020, by the PEBA staff. The staff also supplied asset information as of July 1, 2020. 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, 2020.

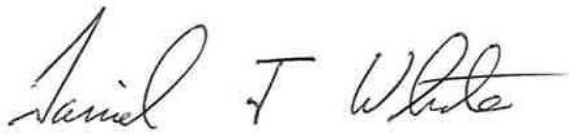
All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of South Carolina Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. All three are also Enrolled Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. Each are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.



Joseph P. Newton, FSA, MAAA, EA
Pension Market Leader and Actuary



Daniel J. White, FSA, MAAA, EA
Senior Consultant



Thomas Lyle, FSA, MAAA, EA
Consultant



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SECTION A

EXECUTIVE SUMMARY

Executive Summary

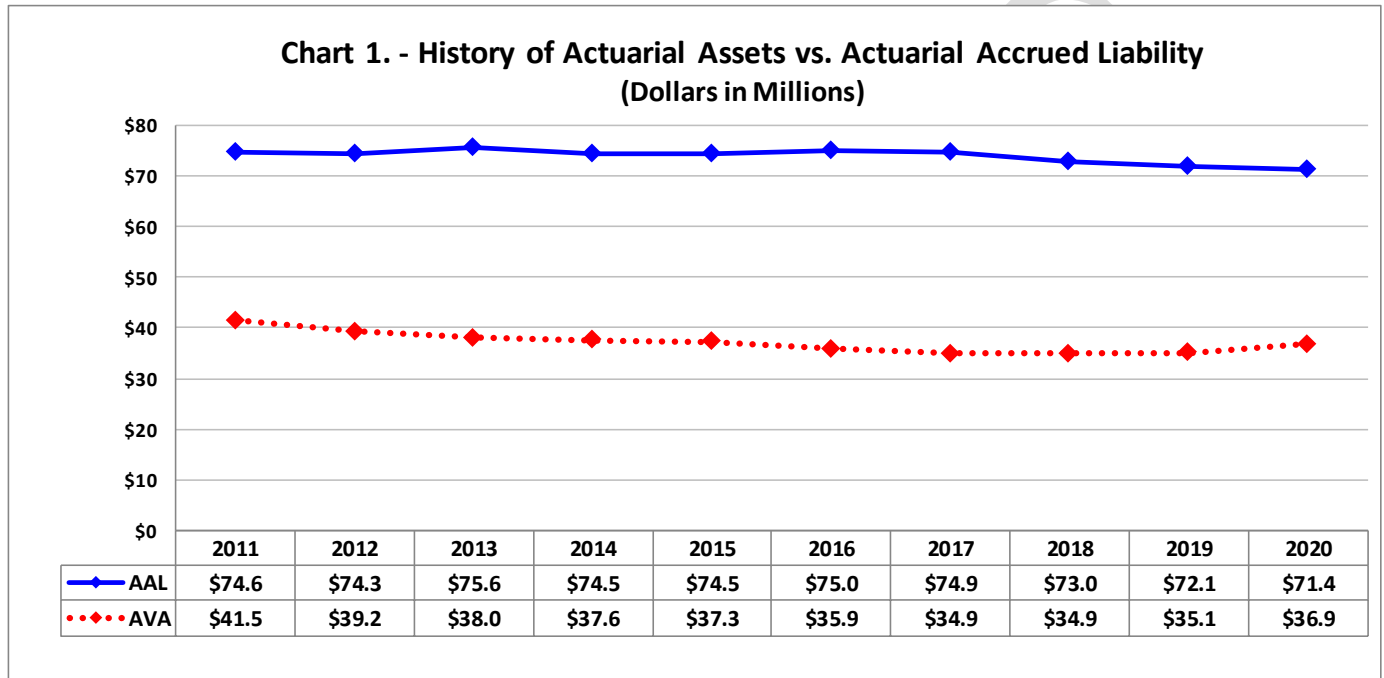
(Dollar amounts expressed in thousands)

Valuation Date:	July 1, 2020	July 1, 2019
Membership <ul style="list-style-type: none"> Number of <ul style="list-style-type: none"> Active positions 69 Special contributors 18 Retirees and beneficiaries 338 Inactive members 35 Total 460 Projected payroll \$1,570 		
Contribution Requirement <ul style="list-style-type: none"> Member contribution rate 11.00% Employer contribution requirement ¹ \$6,279 		11.00% \$5,956
Assets <ul style="list-style-type: none"> Market value \$34,454 Actuarial value 36,869 Return on market value -1.3% Return on actuarial value 4.4% Ratio - actuarial value to market value 107.0% External cash flow % 0.6% 		\$34,712 35,140 5.7% 2.3% 101.2% -1.6%
Actuarial Information <ul style="list-style-type: none"> Normal cost % 23.26% Actuarial accrued liability (AAL) \$71,426 Unfunded actuarial accrued liability (UAAL) 34,557 Funded ratio 51.6% Funding period from the valuation date 7 Years 		22.91% \$72,055 36,915 48.8% 8 Years
Reconciliation of UAAL <ul style="list-style-type: none"> Beginning of Year UAAL \$36,915 - Interest on UAAL 2,235 - Amortization payment (6,092) - Assumption change 0 - Asset experience 1,010 - Liability experience 489 - Legislative changes 0 End of Year UAAL \$34,557 		\$38,102 2,762 (5,725) 0 1,703 73 0 \$36,915

¹ The contribution requirement determined by the July 1, 2020 valuation is effective for the fiscal year beginning July 1, 2021. The contribution requirement determined by the July 1, 2019 valuation was adopted by the Board to be effective for the fiscal year beginning July 1, 2020.

Executive Summary (Continued)

The unfunded actuarial accrued liability decreased by \$2.4 million since the prior year's valuation to \$34.5 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 \$2.4 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 four years.

The recommended employer contribution requirement determined by the July 1, 2020 actuarial valuation increased from the prior year's contribution requirement by \$0.323 million to \$6.279 million. Absent legislative changes or demographic or investment experience that is significantly different than assumed, we expect the recommended contribution to be relatively constant each future year until the funded ratio attains 100%. Also, due to the 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

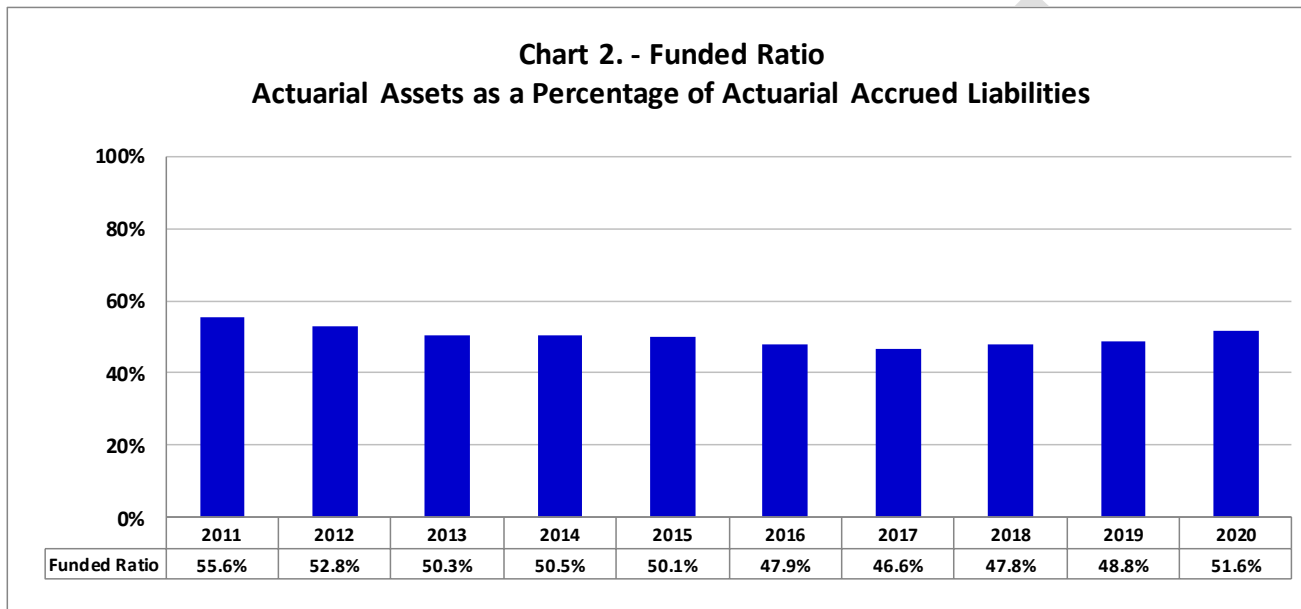
The results of the July 1, 2020 actuarial valuation of the Retirement System for Members of the General Assembly are presented in this report. The purposes of the valuation report is to depict the current financial condition of the System, determine the annual required contribution, and analyze changes 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. Section E is new this year and provides an assessment and disclosure of risk as required by Actuarial Standards of Practice No. 51. 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 increased from 48.8% to 51.6% 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.

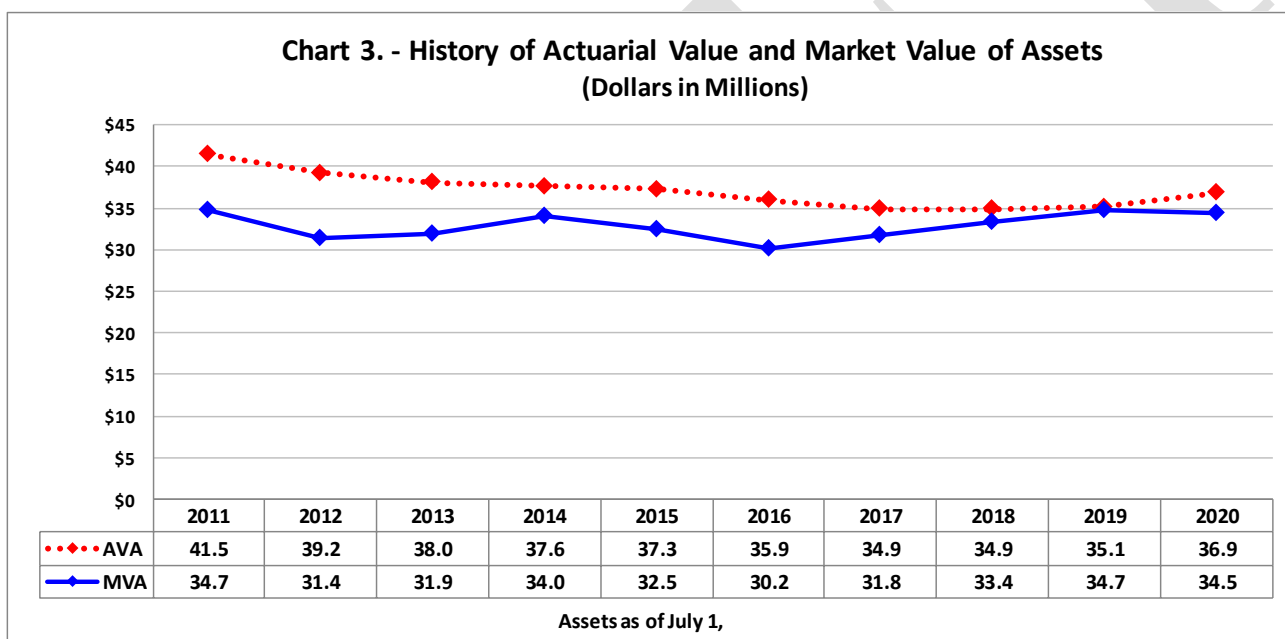


The Board's current funding policy for this plan is to fully amortize the unfunded actuarial accrued liability (UAAL) by June 30, 2027. Under this funding policy, there are 7 years remaining in the funding period from the valuation date.

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 increased from \$35.1 million to \$36.9 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 for fiscal year 2020 was -1.3%, which is less than the investment return assumption. The return on an actuarial (smoothed) asset value was 4.4%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.



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 \$36.9 million on July 1, 2019 to \$34.6 million on July 1, 2020. 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	\$36,915
- Interest on UAAL	\$2,235
- Amortization payment	(6,092)
- Assumption change	0
- Asset experience	1,010
- Liability experience	489
- Legislative changes	0
- Total change	(\$2,358)
• End of Year UAAL	\$34,557

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

The following table provides a reconciliation of the change in the recommended contribution from 2019 to 2020 valuation. The lower than expected return on assets had the largest single impact on the change in the recommended contribution.

Change in Recommended Employer Contribution	
(Dollars in thousands)	
• Prior year valuation	\$5,956
- Expected change	\$0
- Assumption change	0
- Asset experience	214
- Liability experience	109
- Total change	\$323
• Current year valuation	\$6,279

This funding method and contribution policy is designed to result in relatively level contribution requirements from year to year. However, as the funding period decreases, there could be increased volatility in the contribution requirement because experience gains and losses will be amortized over a shorter period.

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. The assumptions used in this actuarial valuation are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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).

SECTION C

ACTUARIAL TABLES

Actuarial Tables

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Summary of Cost Items
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Projected payroll of active members	\$ 1,570	\$ 1,570
2. Present value of future pay	\$ 7,443	\$ 8,266
3. Normal cost		
a. Total normal cost	\$ 366	\$ 360
b. Less: member contribution	(173)	(173)
c. Employer normal cost	\$ 193	\$ 187
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 15,756	\$ 14,920
b. Less: present value of future normal costs	(1,448)	(1,605)
c. Actuarial accrued liability	\$ 14,308	\$ 13,315
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	\$ 53,951	\$ 55,781
b. Inactive members	3,167	2,959
c. Active members (Item 4c)	14,308	13,315
d. Total	\$ 71,426	\$ 72,055
6. Actuarial value of assets	\$ 36,869	\$ 35,140
7. Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	\$ 34,557	\$ 36,915
8. Annual Required Contribution		
a. Employer normal cost	\$ 193	\$ 187
b. Employer contribution to amortize the UAAL	6,086	5,769
c. Total employer contribution	\$ 6,279	\$ 5,956

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

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Service retirement	\$ 15,263	\$ 14,393
b. Disability retirement	207	228
c. Survivors' benefits	286	299
d. Total	<u>\$ 15,756</u>	<u>\$ 14,920</u>
2. Retired members		
a. Service retirement	\$ 46,088	\$ 47,986
b. Disability retirement	0	0
c. Beneficiaries	7,658	7,586
d. Incidental death benefits	205	209
e. Total	<u>\$ 53,951</u>	<u>\$ 55,781</u>
3. Inactive members		
a. Vested terminations	\$ 2,959	\$ 2,750
b. Nonvested terminations	208	209
c. Total	<u>\$ 3,167</u>	<u>\$ 2,959</u>
4. Total actuarial present value of future benefits	<u>\$ 72,874</u>	<u>\$ 73,660</u>

Analysis of Normal Cost
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Total normal cost rate		
a. Service retirement	21.17%	20.81%
b. Survivor benefits	0.86%	0.86%
c. Disability benefits	1.11%	1.12%
d. Total	23.14%	22.79%
2. Admin expenses	0.12%	0.12%
3. Less: member contribution rate	11.00%	11.00%
4. Net employer normal cost rate	12.26%	11.91%
5. Projected valuation payroll	\$1,570	\$1,570
6. Projected employer normal cost contribution	\$192	\$187

Results of July 1, 2020 Valuation
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)
1. Actuarial Present Value of Future Benefits	
a. Present retired members and beneficiaries	\$ 53,951
b. Present active and inactive members	18,923
c. Total actuarial present value	\$ 72,874
2. Present Value of Future Normal Contributions	
a. Employee	\$ 818
b. Employer	630
c. Total future normal contributions	\$ 1,448
3. Actuarial Liability	\$ 71,426
4. Current Actuarial Value of Assets	\$ 36,869
5. Unfunded Actuarial Liability	\$ 34,557
6. Unfunded Actuarial Liability Liquidation Period from the Valuation Date	7 years

Actuarial Balance Sheet

(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Assets		
a. Current Assets (Actuarial Value)		
i. Employee annuity savings fund	\$ 7,046	\$ 6,661
ii. Employer annuity accumulation fund	29,823	28,479
iii. Total current assets	\$ 36,869	\$ 35,140
b. Present Value of Future Member Contributions ¹	\$ 818	\$ 909
c. Present Value of Future Employer Contributions		
i. Normal contributions	\$ 630	\$ 696
ii. Accrued liability contributions	34,557	36,915
iii. Total future employer contributions	\$ 35,187	\$ 37,611
d. Total Assets	\$ 72,874	\$ 73,660
2. Liabilities		
a. Employee Annuity Savings Fund		
i. Past member contributions	\$ 7,046	\$ 6,661
ii. Present value of future member contributions ¹	818	909
iii. Total contributions to employee annuity savings fund	\$ 7,864	\$ 7,570
b. Employer Annuity Accumulation Fund		
i. Benefits currently in payment	\$ 53,951	\$ 55,781
ii. Benefits to be provided to other members	11,059	10,309
iii. Total benefits payable from employer annuity accumulation fund	\$ 65,010	\$ 66,090
c. Total Liabilities	\$ 72,874	\$ 73,660

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, 2020 (2)	July 1, 2019 (3)
1. Cash and cash equivalents (operating cash)	\$ 6,566	\$ 5,281
2. Receivables	1,483	1,490
3. Investments		
a. Short-term securities	\$ 328	\$ 401
b. Fixed income (global)	3,856	4,601
c. Global public equity	14,039	11,595
d. Opportunistic	231	2,714
e. Alternative investments	10,766	10,118
f. Total investments	\$ 29,220	\$ 29,429
4. Securities lending cash collateral invested	\$ 21	\$ 41
5. Prepaid administrative expenses	1	4
6. Capital assets, net of accumulated depreciation	6	6
7. Total assets	\$ 37,297	\$ 36,251
8. Liabilities		
a. Due to other systems	\$ 0	\$ 0
b. Accounts payable	2,565	1,276
c. Investment fees payable	8	12
d. Obligations under securities lending	21	41
e. Deferred retirement benefits	0	0
f. Due to employee insurance program	0	0
g. Benefit payable	2	0
h. Other liabilities	247	210
i. Total liabilities	\$ 2,843	\$ 1,539
9. Total market value of assets available for benefits (Item 7. - Item 8.i.)	\$ 34,454	\$ 34,712
10. Asset allocation (investments) ¹		
a. Net invested cash	16.1%	16.4%
b. Fixed income	11.2%	13.3%
c. Public equities	40.7%	33.4%
d. Global tactical asset allocation	0.7%	7.8%
e. Alternative investments	31.3%	29.1%
f. Total investments	100.0%	100.0%

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, 2020 (1)	July 1, 2019 (2)
1. Value of Assets at Beginning of Year	\$ 34,712	\$ 33,394
2. Revenue for the Year		
a. Contributions		
i. Member contributions	\$ 222	\$ 162
ii. Employer contributions	6,329	5,804
iii. Total	\$ 6,551	\$ 5,966
b. Income		
i. Interest, dividends, and other income	\$ 698	\$ 732
ii. Investment expenses	(233)	(329)
iii. Net	\$ 465	\$ 403
c. Net realized and unrealized gains (losses)	\$ (908)	\$ 1,484
d. Total revenue	\$ 6,108	\$ 7,853
3. Expenditures for the Year		
a. Disbursements		
i. Refunds	\$ 0	\$ 17
ii. Regular annuity benefits	6,323	6,480
iii. Other benefit payments	25	18
iv. Net transfers to other systems	0	0
v. Total	\$ 6,348	\$ 6,515
b. Administrative expenses and depreciation	18	20
c. Total expenditures	\$ 6,366	\$ 6,535
4. Increase in Net Assets (Item 2. - Item 3.)	\$ (258)	\$ 1,318
5. Value of Assets at End of Year (Item 1. + Item 4.)	\$ 34,454	\$ 34,712
6. Net External Cash Flow		
a. Dollar amount	\$ 203	\$ (549)
b. Percentage of market value	0.6%	-1.6%

Development of Actuarial Value of Assets
(Dollar amounts expressed in thousands)

		Year Ending June 30, 2020	
1.	Actuarial value of assets at beginning of year	\$	35,140
2.	Market value of assets at beginning of year	\$	34,712
3.	Net new investments		
a.	Contributions	\$	6,551
b.	Disbursements		(6,366)
c.	Subtotal		185
4.	Market value of assets at end of year	\$	34,454
5.	Net earnings (Item 4. - Item 2. - Item 3.c.)	\$	(443)
6.	Assumed investment return rate for fiscal year		7.25%
7.	Expected return (Item 6. x (Item 2. + 1/2 Item 3.c))	\$	2,523
8.	Excess return (Item 5. - Item 7.)	\$	(2,966)
9.	Excess return on assets as of June 30, 2020:		
	<u>Fiscal Year</u> <u>Ending June 30,</u>	<u>Excess</u> <u>Return</u>	<u>Percent</u> <u>Deferred</u>
	(1)	(2)	(3)
a.	2020	\$ (2,966)	80%
b.	2019	(513)	60%
c.	2018	99	40%
d.	2017	1,130	20%
e.	2016	(2,645)	0%
f.	Total		
			\$ (2,415)
10.	Actuarial value of assets as of June 30, 2020 (Item 4. - Item 9.f.)	\$	36,869
11.	Expected actuarial value as of June 30, 2020	\$	37,879
12.	Asset gain (loss) for year (Item 10. - Item 11.)	\$	(1,010)
13.	Asset gain (loss) as % of the actuarial value of assets		-2.7%
14.	Ratio of actuarial value to market value		107.0%

Estimation of Yields
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2020 (1)	July 1, 2019 (2)
1. Market Value Yield		
a. Beginning of year market assets	\$ 34,712	\$ 33,394
b. Contributions to fund during the year	6,551	5,966
c. Disbursements	(6,366)	(6,535)
d. Investment income (net of investment expenses)	<u>(443)</u>	<u>1,887</u>
e. End of year market assets	\$ 34,454	\$ 34,712
f. Estimated dollar weighted market value yield	-1.3%	5.7%
2. Actuarial Value Yield		
a. Beginning of year actuarial assets	\$ 35,140	\$ 34,902
b. Contributions to fund during the year	6,551	5,966
c. Disbursements	(6,366)	(6,535)
d. Investment income (net of investment expenses)	<u>1,544</u>	<u>807</u>
e. End of year actuarial assets	\$ 36,869	\$ 35,140
f. Estimated actuarial value yield	4.4%	2.3%

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)
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%
2019	35,140	72,055	36,915	48.8%	1,570	2,351.3%
2020	36,869	71,426	34,557	51.6%	1,570	2,201.1%

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, 2020
Actuarial cost method	Entry Age Normal
Amortization method	Level dollar
Amortization period for contribution requirement	7-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, (1)	Actuarial Accrued Liability			Valuation Assets (5)	Portion of Aggregate Accrued Liabilities Covered by Assets		
	Active Member Contributions (2)	Retirants & Beneficiaries (3)	Active & Inactive Members (Employer Financed) (4)		Active (6)	Retirants (7)	ER Financed (8)
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%
2019	6,661	55,781	9,613	35,140	100.0%	51.1%	0.0%
2020	7,046	53,951	10,429	36,869	100.0%	55.3%	0.0%

SECTION D

MEMBERSHIP INFORMATION

Membership Information

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Summary of Membership Data

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active Members		
a. Males	61	61
b. Females	8	8
c. Total members	69	69
d. Total annualized prior year pay	\$ 1,570,200	\$ 1,570,200
e. Average pay	\$ 22,757	\$ 22,757
f. Average age	59.5	58.5
g. Average service	18.1	17.1
h. Member contributions with interest	\$ 4,717,419	\$ 4,369,901
i. Average contributions with interest	\$ 68,368	\$ 63,332
2. Special Contributors		
a. Males	14	16
b. Females	4	3
c. Total members	18	19
d. Member contributions with interest	\$ 842,963	\$ 900,447
e. Average contributions with interest	46,831	47,392
3. Vested Inactive Members		
a. Number	18	18
b. Total annual deferred benefits	\$ 354,671	\$ 333,012
c. Average annual deferred benefit	\$ 19,704	\$ 18,501
4. Nonvested Inactive Members		
a. Number	17	18
b. Member contributions with interest	\$ 207,972	\$ 209,111
c. Average contributions with interest	\$ 12,234	\$ 11,617
5. Service Retirees		
a. Number	264	272
b. Total annual benefits	\$ 5,251,517	\$ 5,396,988
c. Average annual benefit	\$ 19,892	\$ 19,842
d. Average age at the valuation date	75.0	74.6
e. Average age at retirement date	60.8	61.0
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
e. Average age at retirement date	N/A	N/A
7. Beneficiaries		
a. Number	74	73
b. Total annual benefits	\$ 1,008,701	\$ 980,750
c. Average annual benefit	\$ 13,631	\$ 13,435
d. Average age at the valuation date	73.6	73.0

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)		
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
2019	2	69	-16.9%	1,570	-15.9%	22,757	1.3%	58.5	17.1
2020	2	69	0.0%	1,570	0.0%	22,757	0.0%	59.5	18.1

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	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	1	4	-	1	-	-	-	6
45-49	-	-	-	-	-	-	3	5	2	-	-	-	10
50-54	-	-	-	-	-	-	5	5	4	2	-	-	16
55-59	-	-	-	-	-	-	9	2	7	1	-	1	20
60-64	-	-	-	-	-	1	4	4	2	3	1	-	15
65 & Over	-	-	-	-	-	-	9	4	3	3	-	1	20
Total	-	-	-	-	-	2	34	20	19	9	1	2	87

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	134	\$ 2,722,836	\$ 1,693
100% J&S	56	1,067,478	1,589
100% Pop-up	32	640,463	1,668
50% J&S	23	429,772	1,557
50% Pop-up	19	390,968	1,715
Subtotal:	264	\$ 5,251,517	\$ 1,658
Disability:			
Maximum	0	\$ 0	\$ 0
Beneficiaries:	74	\$ 1,008,701	\$ 1,136
Total:	338	\$ 6,260,218	\$ 1,543

Distribution of Annuitants by Monthly Benefit

Monthly Benefit Amount			Number of Annuitants	Female	Male	Average Service
(1)			(2)	(3)	(4)	(5)
Under \$200			11	4	7	1.82
\$	200	- 399	12	7	5	11.50
	400	- 599	13	6	7	12.00
	600	- 799	21	7	14	13.10
	800	- 999	32	17	15	15.03
	1,000	- 1,199	31	9	22	18.29
	1,200	- 1,399	23	2	21	18.22
	1,400	- 1,599	35	10	25	19.71
	1,600	- 1,799	40	6	34	20.85
	1,800	- 1,999	38	9	29	22.37
	2,000	- 2,199	18	6	12	28.72
	2,200	- 2,399	16	3	13	27.31
	2,400	- 2,599	17	3	14	30.29
	2,600	- 2,799	14	3	11	32.36
	2,800	- 2,999	5	0	5	29.80
	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			338	95	243	20.41

Average age at retirement for service retirees as of July 1, 2020 is age 60.8.

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)		
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
2019	19	290	17	268	345	6,378	0.3%	18,486
2020	7	99	14	217	338	6,260	-1.8%	18,521

SECTION E

ASSESSMENT AND DISCLOSURE OF RISK

Risks Associated with Measuring the Accrued Liability And Actuarially Determined Contribution

(As Required by ASOP No. 51)

The determination of GARS accrued liability, actuarially determined contribution, and calculated funding period requires the use of assumptions regarding future economic and demographic experience. The risk measures illustrated in this section are intended to aid stakeholders in understanding the effects when future experience differs from the assumptions used in performing an actuarial valuation. These risk measures may also help with illustrating the potential volatility in the funded status and actuarially determined contributions that result from differences between actual experience and the expected experience based on the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience (economic and demographic) differing from the assumptions, changes in assumptions due to changing conditions, changes in contribution requirements due to modifications to the funding policy, and changes in the liability and cost due to changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risks that may reasonably be anticipated to significantly affect the System's future financial condition include:

- Investment risk – actual investment returns may differ from expected returns;
- Longevity risk – members may live longer or shorter than expected and receive pensions for a time period different than assumed;
- Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liabilities and contributions differing from expected;
- Salary and payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liabilities and contributions differing from expected;
- Asset/Liability mismatch – changes in assets may be inconsistent with changes in liabilities, thereby altering the relative difference between the assets and liabilities, which may alter the funded status and contribution requirements;
- Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions are not made in accordance with the System's funding policy or Statute, other anticipated payments to the plan are not made, or material changes occur in the anticipated number of covered employees, covered payroll, or another relevant contribution base.

On the other hand, effects of certain experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate of return, the funded status of the plan can be expected to decrease (or increase) more than anticipated.

Under South Carolina State Code, the Board must certify the employer contribution annually. This amount is determined actuarially, based on the Board's funding policy. The contribution requirement determined by this actuarial valuation becomes effective twelve months after the valuation date.

Employer Risk with Contribution Requirements

The funding policy is intended to finance the unfunded actuarial accrued liability over a reasonable time period and provide stability in the employer contribution rates so employers are better able to budget their pension cost in future years. However, as the funding period decreases there can be increased short-term volatility in the contribution requirement.

Plan Maturity Measures

Risks faced by a pension plan evolve over time. A relatively new plan with virtually no assets and paying few benefits will experience lower investment risk than a mature plan with a significant amount of assets and large number of members receiving benefits. There are a few measures that can assist stakeholders in understanding and comparing the maturity of a plan to other systems, which include:

- Ratio of market value of assets to payroll: The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. If assets are approximately the same as covered payroll, an investment return that is 5% different than assumed would equal 5% of payroll. In another example, if the assets are approximately twice as large as covered payroll, an investment return that is 5% different than assumed would equal 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.
- Ratio of actuarial accrued liability to payroll: The ratio of actuarial accrued liability to payroll can be used as a measure to indicate the potential volatility of contributions due to volatility in the liability experience. For instance, if the actuarial accrued liability is 5 times the size of the covered payroll, then a change in the liability that is 2% different than expected would be a change in magnitude that is 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.

- Ratio of active to retired members: A relatively mature open plan is likely to have close to the same number of actives to retirees resulting in a ratio that is around 1.0. On the other hand, a super-mature plan, or a plan that is closed to new entrants will have more retirees than active members resulting in a ratio below 1.0. As this ratio declines, a larger portion of the total actuarial accrued liability in the System is attributable to retirees. This metric also typically moves in tandem with the liability to payroll metric, which provides an indication of potential contribution volatility.
- Ratio of net cash flow to market value of assets: A negative net cash flow means that benefit payments exceed contributions and the plan is depending on investment earnings and possibly existing funds to make payments to retirees. A certain amount of negative net cash flow is expected to occur when benefits are prefunded and the plan has matured. However, a relatively large negative net cash flow as a percent of assets may be an indication of the need for additional contributions for a plan with a low funded ratio.

The following exhibit provides a summary of these measures for GARS. We have also included these metrics for the prior four years so stakeholders can identify how these measures are trending.

	July 1,				
	2020	2019	2018	2017	2016
Ratio of the market value of assets to total payroll	21.95	22.11	17.90	16.21	13.03
Ratio of actuarial accrued liability to payroll	45.49	45.90	39.12	38.17	32.38
Ratio of actives to retirees and beneficiaries	0.20	0.20	0.24	0.25	0.28
Ratio of net cash flow to market value of assets	0.6%	-1.6%	-2.3%	-5.4%	-6.7%

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% 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.
2. Percent married: 100% of active members are assumed to be married.
3. Age difference: Males are assumed to be four years older than their spouses.
4. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.
5. 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.
6. It is assumed there will be no recoveries once disabled.
7. Decrement timing: Decrements of all types are assumed to occur mid-year.
8. 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.
9. Benefit Service: All active and special contributing members are assumed to accrue one year of 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 permits 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.

Decrements: 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.

DRAFT

Retirement System for Judges and Solicitors of the State of South Carolina (JSRS)

Actuarial Valuation Report
as of July 1, 2020

DRAFT





November 24, 2020

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

Subject: Actuarial Valuation as of July 1, 2020

Dear Members of the Board:

This report describes the current actuarial condition of the Retirement System for Judges and Solicitors of the State of South Carolina (JSRS), determines the unfunded liability and the calculated funding period based on the current employer contribution effort, as well as analyzes changes in the System's financial condition. In addition, the report provides various summaries of the plan's membership. A separate report is issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements No. 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 JSRS. 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 certifies the employer contribution rate annually and is based on the Board's funding policy. If new legislation is enacted between the valuation date and the date the contribution rate becomes effective, the Board may adjust the contribution rate before certifying them, in order to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

FINANCING OBJECTIVES AND FUNDING POLICY

The Board's current funding policy is to establish a minimum contribution rate which results in the unfunded actuarial accrued liability being funded over a period that is the same as the maximum funding period established for the South Carolina Retirement System in accordance with Section 9-1-1085 of the South Carolina Code. Under this Statute reference, the maximum amortization period is 27 years as of July 1, 2020 and will decrease by one year in each of the next seven years until reaching a maximum 20-year funding period on July 1, 2027. According to the Board's contribution policy, the calculated contribution rate is a minimum and the Board certified rate may not be less than the rate established for the prior fiscal year as long as the System's funded ratio is less than 85%.

For purposes of calculating the funding period for the System's unfunded liability, payroll based contributions and non-payroll based appropriations are considered.

Beginning July 1, 2019, the State increased the contribution rate from 52.49% of pay to 62.94% of pay and has committed \$2.9 million in non-payroll based appropriations each future year until the System becomes fully funded. This contribution effort satisfies the Board's minimum 27-year funding period requirement.

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 System's funded ratio, based on the actuarial valuation of assets, increased from 41.8% at July 1, 2019 to 42.6% at July 1, 2020. The single largest source of this improvement is due to the State's increased contribution effort and we expect the funded ratio of the System to gradually improve (absent experience that is unfavorable compared to that assumed).

If the market value of assets had been used in the calculation instead of the actuarial (smoothed) value of assets, the funded ratio for the System would have been 39.8%, compared to 41.5% in the prior year. The decrease in the funded ratio on a market value basis is primarily due to unfavorable investment experience during the last fiscal year. Plan assets earned a -1.58% return on a time weighted-basis (net of fees) as reported in the financial statement of the South Carolina Retirement Systems for the year ending June 30, 2020. The -1.4% return documented in this report was determined on a dollar-weighted basis and assumes mid-year cash flows.

ASSUMPTIONS AND METHODS

There were no assumption changes since the prior actuarial valuation. These assumptions are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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.

This report was prepared using our proprietary valuation model and related software, which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those that were in effect on July 1, 2020. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.



DATA

Census data for retired, active and inactive members was supplied as of July 1, 2020, by the PEBA staff. The staff also supplied asset information as of July 1, 2020. 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.

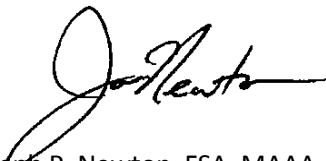
CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of JSRS as of July 1, 2020.

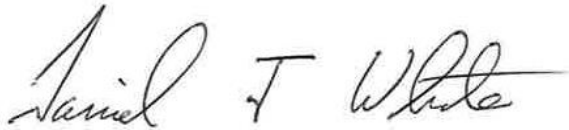
All of our work conforms with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of South Carolina Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. All three are also Enrolled Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. Each are experienced in performing valuations for large public retirement systems.

Sincerely,

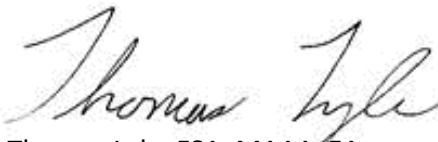
Gabriel, Roeder, Smith & Co.



Joseph P. Newton, FSA, MAAA, EA
Pension Market Leader and Actuary



Daniel J. White, FSA, MAAA, EA
Senior Consultant



Thomas Lyle, FSA, MAAA, EA
Consultant



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SECTION A

EXECUTIVE SUMMARY

Executive Summary

(Dollar amounts expressed in thousands)

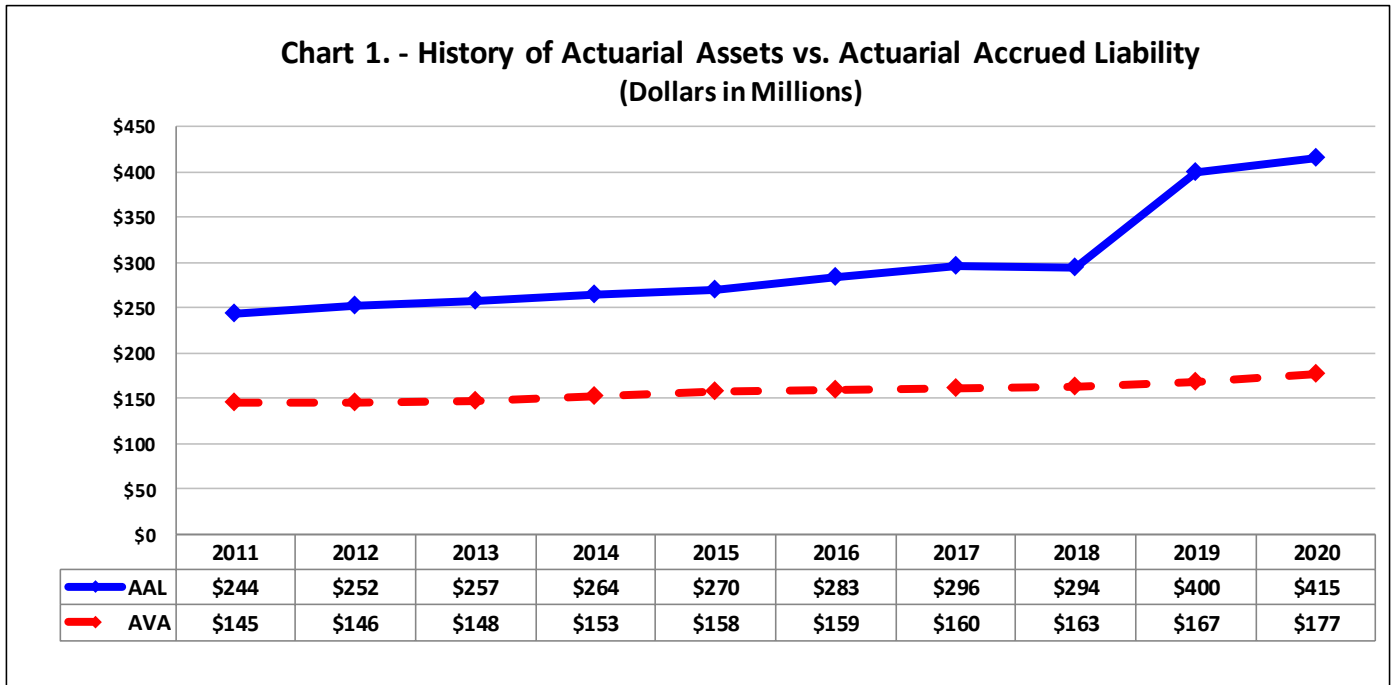
Valuation Date:	July 1, 2020	July 1, 2019
Membership <ul style="list-style-type: none"> Number of <ul style="list-style-type: none"> - Active members¹ - Retirees and beneficiaries - Inactive members - Total Projected payroll of active members 	<div>160</div> <div>205</div> <div>4</div> <div>369</div> <div>\$30,346</div>	<div>160</div> <div>197</div> <div>6</div> <div>363</div> <div>\$30,346</div>
Contribution Rates <ul style="list-style-type: none"> Employer contribution rate Non-Payroll based State appropriations Member 	<div>62.94%²</div> <div>\$2,900</div> <div>10.00%</div>	<div>62.94%</div> <div>\$2,900</div> <div>10.00%</div>
Assets <ul style="list-style-type: none"> Market value Actuarial value Return on market value Return on actuarial value Ratio of actuarial to market value of assets External cash flow % 	<div>\$165,250</div> <div>176,649</div> <div>-1.4%</div> <div>4.6%</div> <div>106.9%</div> <div>1.1%</div>	<div>\$165,843</div> <div>167,119</div> <div>5.8%</div> <div>4.4%</div> <div>100.8%</div> <div>-2.0%</div>
Actuarial Information <ul style="list-style-type: none"> Normal cost % Actuarial accrued liability (AAL) Unfunded actuarial accrued liability (UAAL) Funded ratio Calculated funding period (years) 	<div>28.85%</div> <div>\$415,069</div> <div>238,420</div> <div>42.6%</div> <div>21</div>	<div>29.51%</div> <div>\$399,746</div> <div>232,627</div> <div>41.8%</div> <div>20</div>
Reconciliation of UAAL <ul style="list-style-type: none"> Beginning of Year UAAL <ul style="list-style-type: none"> - Interest on UAAL - Amortization payment - Assumption/method changes - Asset experience - Benefit adjustment - Salary experience - Other liability experience - Legislative Changes End of Year UAAL 	<div>\$232,627</div> <div>16,866</div> <div>(19,766)</div> <div>0</div> <div>4,418</div> <div>(7,540)</div> <div>(553)</div> <div>12,368</div> <div>0</div> <div>\$238,420</div>	<div>\$130,457</div> <div>9,458</div> <div>(9,032)</div> <div>0</div> <div>4,584</div> <div>64,361</div> <div>25,686</div> <div>7,113</div> <div>0</div> <div>\$232,627</div>

¹ Active member counts include 18 and 21 retired-in-place members as of July 1, 2020 and July 1, 2019, respectively and also includes unfilled positions.

² The 62.94% contribution rate includes the cost of incidental death benefits.

Executive Summary (Continued)

The unfunded actuarial accrued liability increased by \$5.8 million since the prior year's valuation to \$238.4 million. The largest source of this increase is due to actuarial losses due to changes in active membership experience. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for JSRS.



As of the valuation date, the System has \$11.4 million in deferred investment losses. Absent future favorable investment experience to offset the existing deferred investment loss amount, the existing deferred losses will be fully reflected in the actuarial value of assets over the next four years. The calculated funding period based on the July 1, 2020 actuarial valuation is 21 years.

Note, due to the benefit provision that provides that benefits paid to retired members and surviving spouses are increased by an amount equal to the percentage increase in the current salary paid to the position from which the member retired, the System will experience significant actuarial gains or losses when the actual salary increase provided to covered positions is materially different than assumed. Due to the combination of this benefit feature and the current financial condition of the System, it is imperative that the State continues the current contribution effort each future year. Also, it is possible the current contribution effort may need to be increased in a future year depending on emerging economic and demographic experience.

SECTION B

DISCUSSION

Discussion

The results of the July 1, 2020 actuarial valuation of the Retirement System for Judges and Solicitors are presented in this report. The primary purposes of the valuation report are to depict the current financial condition of the System 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 the financial condition of the retirement system.

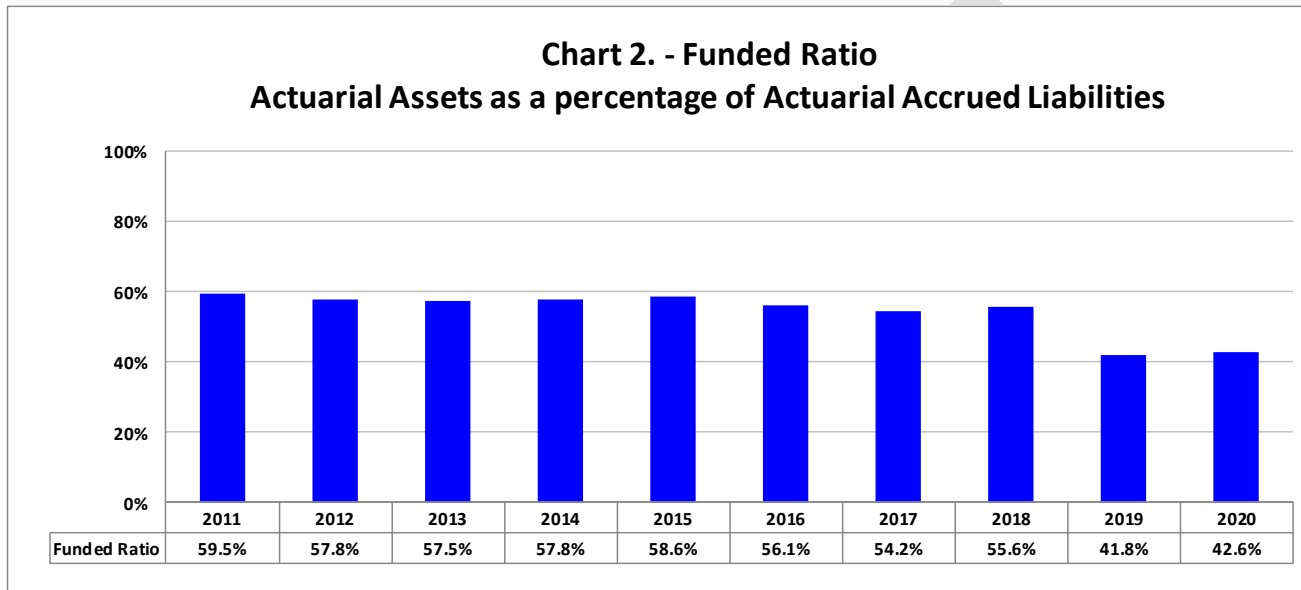
All of the actuarial and financial tables referenced by the other sections of this report appear in Section C. Section D provides member data and statistical information. Section E is new this year and provides an assessment and disclosure of risk as required by Actuarial Standards of Practice No. 51. 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.

DRAFT

Funding Progress

The funded ratio increased from 41.8% to 42.6% since the prior valuation. The increase in the funded ratio is primarily due to the State's contribution effort.

As shown in the table below, the funding ratio (on a smoothed asset basis) increased from 2019 to 2020. Table 10, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.



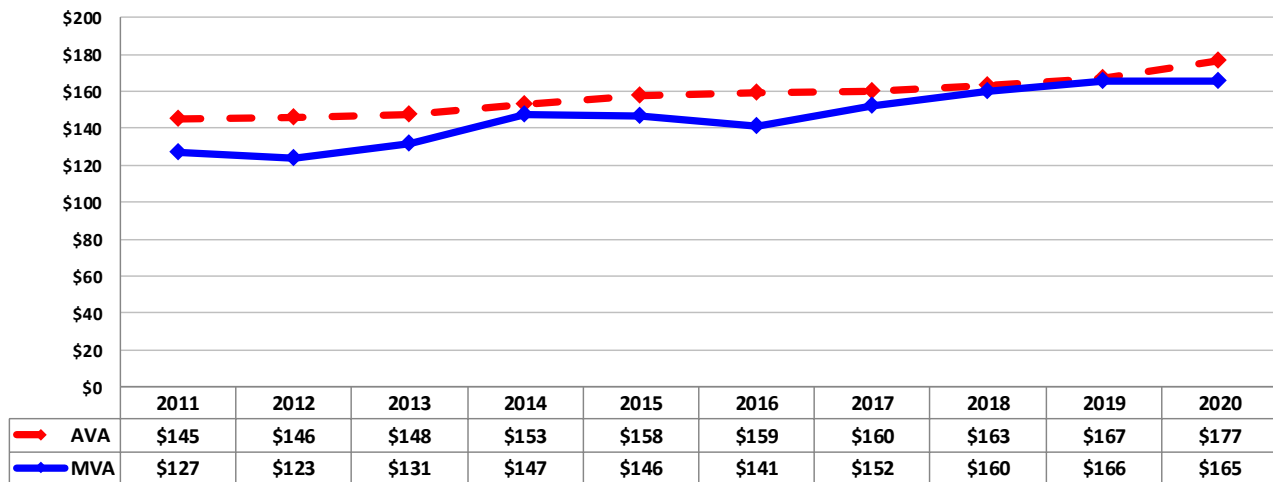
As a result of the increase in the contribution effort beginning July 1, 2019, we expect the funded ratio to begin gradually improving (absent assumption changes or experience that is unfavorable compared to that assumed). Also, we expect the dollar amount of the unfunded actuarial accrued liability to begin decreasing (i.e. positive amortization of the unfunded actuarial accrued liability).

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 the market value of assets (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 increased from \$167.1 million to \$176.6 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 for fiscal year 2020 was -1.6%. Because of the recognition of prior investment experience in prior years, the actuarial (smoothed) asset value returned was 4.6%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

Chart 3. - History of Actuarial Value and Market Value of Assets
(Dollars in Millions)



Assets as of July 1,

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 over many years. The demographic experience for the last year is briefly summarized in the chart below.

The unfunded actuarial accrued liability (UAAL) has increased from \$232.6 million in 2019 to \$238.4 million in 2020. 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	\$232,627
- Interest on UAAL	16,866
- Amortization payment	(19,766)
- Assumption/method changes	0
- Asset Experience	4,418
- Benefit adjustment	(7,540)
- Salary Experience	(553)
- Other Liability Experience	12,368
- Legislative Changes	0
• End of Year UAAL	<u>\$238,420</u>

The following table provides a reconciliation of the change in the calculated funding period from July 1, 2019 to July 1, 2020.

Change in Funding Period (Years) Based on a 62.94% Contribution Rate	
• Prior Year	20.5
- Expected Experience	(1.1)
- Assumption Change	0.0
- Asset Experience	0.6
- Benefit Adjustment Experience	(1.1)
- Salary Experience	0.8
- Other Demographic Experience	1.5
- Legislative Changes	0.0
- Total Change	0.7
• Current Year Valuation	21.2

As noted earlier, the increase in the State's contribution effort that began on July 1, 2019 is expected to result in a gradual improvement in the funded ratio and a decrease in the dollar amount of the unfunded actuarial accrued liability.

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. There were no assumption changes since the prior actuarial valuation. These assumptions are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that the assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation.

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 an 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 the Board's funding policy or relevant State Code.

Benefit Provisions

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

Below is a summary of the retirement provisions for members in the Retirement System.

Summary of Retirement Provisions

- A retirement benefit equal to 71.3% of the current active salary of the position from which the member retired plus an additional 2.67% of compensation for each year of service beyond 25 years for judges and 24 years for solicitors and public defenders (subject to a maximum retirement allowance that does not exceed 90% of salary).
- The normal form of payment for a married member is a 33 1/3 joint and survivor annuity.
- Active members contribute 10% of compensation.
- Members are eligible for retirement after they have (i) attained age 70 with 15 years of service, or (ii) attained age 65 with 20 years of service or (iii) completed 25 years of creditable service for judges and 24 years for solicitors and public defenders regardless of age.
- Members who have accrued a retirement allowance that is 90% of salary may elect to “retire in place” and begin to receive their accrued retirement benefits while remaining employed. Members who have retired in place but have not attained age 60 will have their retirement benefit paid into a deferred retirement option program (DROP) and receive the balance of their DROP account upon attaining age 60.
- The mandatory retirement age is 72.

SECTION C

ACTUARIAL TABLES

Actuarial Tables

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Summary of Cost Items
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Projected payroll of active members ¹	\$ 30,346	\$ 30,346
2. Present value of future pay	\$ 191,340	\$ 194,700
3. Normal cost rate		
a. Total normal cost rate	28.85%	29.51%
b. Less: member contribution rate	-10.00%	-10.00%
c. Employer normal cost rate	18.85%	19.51%
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 194,502	\$ 183,374
b. Less: present value of future normal costs	(53,597)	(54,506)
c. Actuarial accrued liability	\$ 140,905	\$ 128,868
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	\$ 273,630	\$ 268,747
b. Inactive members	534	2,131
c. Active members (Item 4c)	140,905	128,868
d. Total	\$ 415,069	\$ 399,746
6. Actuarial value of assets	\$ 176,649	\$ 167,119
7. Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	\$ 238,420	\$ 232,627
8. Applicable required contribution rate		
a. Employer normal cost rate	18.85%	19.51%
b. Employer contribution rate available to amortize the UAAL	44.09%	43.43%
c. Total employer contribution rate ²	62.94%	62.94%
9. Funding period based on the current employer contribution rate (years)	21	20

¹ The projected payroll is based on all filled and unfilled positions.

² The 62.94% contribution rate includes the cost of incidental death benefits.

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

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Service retirement	\$ 181,792	\$ 170,221
b. Survivor benefits	2,420	2,408
c. Disability benefits	10,290	10,745
d. Total	\$ 194,502	\$ 183,374
2. Retired members		
a. Service retirement	\$ 251,910	\$ 247,019
b. Disability retirement	0	0
c. Beneficiaries	21,720	21,728
d. Total	\$ 273,630	\$ 268,747
3. Inactive members		
a. Vested terminations	\$ 456	\$ 2,005
b. Nonvested terminations	78	126
c. Total	\$ 534	\$ 2,131
4. Total actuarial present value of future benefits	\$ 468,666	\$ 454,252

Analysis of Normal Cost

	<u>July 1, 2020</u> (1)	<u>July 1, 2019</u> (2)
1. Total normal cost rate		
a. Service retirement	24.24%	24.76%
b. Survivor benefits	0.65%	0.67%
c. Disability benefits	<u>3.84%</u>	<u>3.96%</u>
d. Total	28.73%	29.39%
2. Administrative expense	0.12%	0.12%
3. Less: member contribution rate	<u>10.00%</u>	<u>10.00%</u>
4. Net employer normal cost rate	18.85%	19.51%

Note: The normal cost includes the cost for incidental death benefits.

Results of July 1, 2020 Valuation
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)
1. Actuarial Present Value of Future Benefits	
a. Present retired members and beneficiaries	\$ 273,630
b. Present active and inactive members	195,036
c. Total actuarial present value	\$ 468,666
2. Present Value of Future Normal Contributions	
a. Member	\$ 19,134
b. Employer	34,463
c. Total future normal contributions	\$ 53,597
3. Actuarial Liability	\$ 415,069
4. Current Actuarial Value of Assets	\$ 176,649
5. Unfunded Actuarial Liability	\$ 238,420
6. UAAL Amortization Rates Based on an Employer Contribution Rate of 62.94%	
a. Active members	44.09%
b. DROP and Retired-in-Place Members (including employee contributions)	72.94%
7. Unfunded Actuarial Liability Liquidation Period	21 Years

Note: The employer contribution rate includes the cost for incidental death benefits.

Actuarial Balance Sheet
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Assets		
a. Current assets (actuarial value)		
i. Employee annuity savings fund	\$ 33,153	\$ 30,289
ii. Employer annuity accumulation fund	143,496	136,830
iii. Total current assets	\$ 176,649	\$ 167,119
b. Present value of future member contributions	\$ 19,134	\$ 19,470
c. Present value of future employer contributions		
i. Normal contributions	\$ 34,463	\$ 35,036
ii. Accrued liability contributions	238,420	232,627
iii. Total future employer contributions	\$ 272,883	\$ 267,663
d. Total assets	\$ 468,666	\$ 454,252
2. Liabilities		
a. Employee annuity savings fund		
i. Past member contributions	\$ 33,153	\$ 30,289
ii. Present value of future member contributions	19,134	19,470
iii. Total contributions to employee annuity savings fund	\$ 52,287	\$ 49,759
b. Employer annuity accumulation fund		
i. Benefits currently in payment	\$ 273,630	\$ 268,747
ii. Benefits to be provided to other members	142,749	135,746
iii. Total benefits payable from employer annuity accumulation fund	\$ 416,379	\$ 404,493
c. Total liabilities	\$ 468,666	\$ 454,252

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

Item (1)	July 1, 2020 (2)	July 1, 2019 (3)
1. Cash and cash equivalents (operating cash)	\$ 23,387	\$ 16,874
2. Receivables	8,882	8,253
3. Investments		
a. Short-term securities	\$ 1,651	\$ 2,021
b. Fixed income (global)	19,429	23,181
c. Global public equity	70,734	58,419
d. Opportunistic	1,163	13,676
e. Alternative investments	54,242	50,975
f. Total investments	\$ 147,219	\$ 148,272
4. Securities lending cash collateral invested	\$ 104	\$ 207
5. Prepaid administrative expenses	4	20
6. Capital assets, net of accumulated depreciation	9	9
7. Total assets	\$ 179,605	\$ 173,635
8. Liabilities		
a. Due to other systems	\$ 48	\$ 0
b. Accounts payable	12,922	6,429
c. Investment fees payable	40	58
d. Obligations under securities lending	104	207
e. Deferred retirement benefits	0	0
f. Due to employee insurance program	0	0
g. Benefit payable	0	0
h. Other liabilities	1,241	1,098
i. Total liabilities	\$ 14,355	\$ 7,792
9. Total market value of assets available for benefits (Item 7. - Item 8.i.)	\$ 165,250	\$ 165,843
10. Asset allocation (investments) ¹		
a. Net invested cash	11.9%	11.8%
b. Fixed income	11.8%	14.0%
c. Public equity	42.8%	35.3%
d. Global tactical asset allocation	0.7%	8.2%
e. Alternative investments	32.8%	30.7%
f. Total investments	100.0%	100.0%

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, 2020	July 1, 2019
	(1)	(2)
1. Value of assets at beginning of year	\$ 165,843	\$ 160,036
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 4,966	\$ 2,840
ii. Employer contributions	19,098	11,730
iii. State appropriated contributions	2,900	0
iv. Total	\$ 26,964	\$ 14,570
b. Income		
i. Interest, dividends, and other income	\$ 3,389	\$ 3,334
ii. Investment expenses	(1,175)	(1,670)
iii. Net	\$ 2,214	\$ 1,664
c. Net realized and unrealized gains (losses)	(4,575)	7,519
d. Total revenue	\$ 24,603	\$ 23,753
3. Expenditures for the year		
a. Disbursements		
i. Refunds	\$ 182	\$ 0
ii. Regular annuity benefits	25,301	17,947
iii. Other benefit payments	190	3
iv. Transfers to other systems	(563)	(96)
v. Total	\$ 25,110	\$ 17,854
b. Administrative expenses and depreciation	86	92
c. Total expenditures	\$ 25,196	\$ 17,946
4. Increase in net assets (Item 2. - Item 3.)	\$ (593)	\$ 5,807
5. Value of assets at end of year (Item 1. + Item 4.)	\$ 165,250	\$ 165,843
6. Net external cash flow		
a. Dollar amount	\$ 1,854	\$ (3,284)
b. Percentage of market value	1.1%	-2.0%

Development of Actuarial Value of Assets
(Dollar amounts expressed in thousands)

	Year Ending June 30, 2020
1. Actuarial value of assets at beginning of year	\$ 167,119
2. Market value of assets at beginning of year	\$ 165,843
3. Net new investments	
a. Contributions	\$ 26,964
b. Disbursements	(25,196)
c. Subtotal	1,768
4. Market value of assets at end of year	\$ 165,250
5. Net earnings (Item 4. - Item 2. - Item 3.c.)	\$ (2,361)
6. Assumed investment return rate for fiscal year	7.25%
7. Expected return (Item 6. x (Item 2. + 1/2 Item 3.c.))	\$ 12,088
8. Excess return (Item 5. - Item 7.)	\$ (14,449)
9. Excess return on assets as of June 30, 2020:	
Fiscal Year Ending June 30, (1)	Excess Return (2)
Percent Deferred (3)	Deferred Amount (4)
a. 2020	\$ (14,449)
b. 2019	(2,297)
c. 2018	831
d. 2017	6,031
e. 2016	(11,747)
f. Total	\$ (11,399)
10. Actuarial value of assets as of June 30, 2020 (Item 4. - Item 9.f.)	\$ 176,649
11. Expected actuarial value as of June 30, 2020	\$ 181,067
12. Asset gain (loss) for year (Item 10. - Item 11.)	\$ (4,418)
13. Asset gain (loss) as % of the actuarial value of assets	-2.5%
14. Ratio of actuarial value to market value	106.9%

Estimation of Yields
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2020 (1)	July 1, 2019 (2)
1. Market value yield		
a. Beginning of year market assets	\$ 165,843	\$ 160,036
b. Contributions to fund during the year	26,964	14,570
c. Disbursements	(25,196)	(17,946)
d. Investment income (net of investment)	<u>(2,361)</u>	<u>9,183</u>
e. End of year market assets	\$ 165,250	\$ 165,843
f. Estimated dollar weighted market value yield	-1.4%	5.8%
2. Actuarial value yield		
a. Beginning of year actuarial assets	\$ 167,119	\$ 163,358
b. Contributions to fund during the year	26,964	14,570
c. Disbursements	(25,196)	(17,946)
d. Investment income (net of investment and administrative expenses)	<u>7,762</u>	<u>7,137</u>
e. End of year actuarial assets	\$ 176,649	\$ 167,119
f. Estimated actuarial value yield	4.6%	4.4%

Schedule of Funding Progress
(Dollar amounts expressed in thousands)

July 1,	Actuarial Value of	Actuarial Accrued	Unfunded Actuarial	Funded Ratio	Annual Covered	UAAL as % of
(1)	Assets (AVA)	Liability (AAL)	Accrued Liability	(2)/(3)	Payroll	Payroll (4)/(6)
(1)	(2)	(3)	(UAAL) (3) - (2)	(5)	(6)	(7)
			(4)			
2006	124,837	211,384	86,547	59.1%	15,929	543.3%
2007	132,990	229,388	96,398	58.0%	16,407	587.5%
2008	138,323	213,406	75,083	64.8%	18,661	402.4%
2009	141,797	214,363	72,566	66.1%	18,661	388.9%
2010	142,871	215,823	72,952	66.2%	18,661	390.9%
2011	144,927	243,514	98,587	59.5%	18,661	528.3%
2012	145,604	251,729	106,125	57.8%	19,221	552.1%
2013	147,648	256,988	109,340	57.5%	20,407	535.8%
2014	152,839	264,293	111,454	57.8%	20,815	535.4%
2015	157,983	269,675	111,692	58.6%	21,267	525.2%
2016	158,837	283,304	124,467	56.1%	21,958	566.8%
2017	160,189	295,630	135,441	54.2%	22,347	606.1%
2018	163,358	293,815	130,457	55.6%	22,347	583.8%
2019	167,119	399,746	232,627	41.8%	30,346	766.6%
2020	176,649	415,069	238,420	42.6%	30,346	785.7%

Summary of Principle Assumptions and Methods

Below is a summary of the principle economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

Valuation date:	July 1, 2020
Actuarial cost method:	Entry Age Normal
Amortization method:	Level percentage of payroll
Amortization period for contribution rate:	27-year maximum funding period ¹
Asset valuation method:	5-Year Smoothing
Actuarial assumptions:	
Investment rate of return ²	7.25%
Projected salary increases	2.75%
Inflation	2.25%
Cost-of-living adjustments	2.75%
Retiree mortality	The 2016 Public Retirees of South Carolina Mortality Table projected at Scale AA from the year 2016. Male rates are multiplied by 92% and female rates are multiplied by 98%.

¹ In accordance with the Board's funding policy, the minimum employer contribution rate is determined using the same maximum funding period specified in Section 9-1-1085 of the South Carolina Code for the South Carolina Retirement System. For 2020 the funding period determined on an actuarial value of asset basis may not exceed 27 years. The contribution rate is not permitted to decrease until the ratio of the actuarial value of assets and the actuarial accrued liability is at least 85%.

² This is a prescribed assumption in Section 9-16-335 of South Carolina State Code.

Solvency Test
(Dollar amounts expressed in thousands)

July 1, (1)	Actuarial Accrued Liability			Valuation Assets (5)	Portion of Aggregate Accrued Liabilities Covered by Assets		
	Active Member Contributions (2)	Retirants & Beneficiaries (3)	Active & Inactive Members (Employer Financed) (4)		Active (6)	Retirants (7)	ER Financed (8)
2006	21,857	112,823	76,704	124,837	100.0%	91.3%	0.0%
2007	18,999	149,435	60,954	132,990	100.0%	76.3%	0.0%
2008	17,367	141,510	54,529	138,323	100.0%	85.5%	0.0%
2009	18,431	144,464	51,468	141,797	100.0%	85.4%	0.0%
2010	17,816	150,696	47,311	142,871	100.0%	83.0%	0.0%
2011	18,864	169,841	54,809	144,927	100.0%	74.2%	0.0%
2012	20,005	177,483	54,241	145,604	100.0%	70.8%	0.0%
2013	21,369	178,526	57,093	147,648	100.0%	70.7%	0.0%
2014	22,926	184,625	56,742	152,839	100.0%	70.4%	0.0%
2015	24,650	186,481	58,544	157,983	100.0%	71.5%	0.0%
2016	25,082	200,323	57,899	158,837	100.0%	66.8%	0.0%
2017	26,703	203,030	65,897	160,189	100.0%	65.7%	0.0%
2018	28,259	198,893	66,663	163,358	100.0%	67.9%	0.0%
2019	30,289	268,747	100,710	167,119	100.0%	50.9%	0.0%
2020	33,153	273,630	108,286	176,649	100.0%	52.4%	0.0%

SECTION D

MEMBERSHIP INFORMATION

Membership Information

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Summary of Membership Data

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Males	109	108
b. Females	51	52
c. Total members ¹	160	160
d. Total annualized pay ²	\$ 30,345,856	\$ 30,345,856
e. Average pay ²	\$ 189,662	\$ 189,662
f. Average age	57.2	57.4
g. Average credited service	15.8	15.4
h. Member contributions with interest ³	\$ 32,801,063	\$ 29,562,494
i. Average contributions with interest ³	\$ 234,293	\$ 211,161
2. Vested inactive members		
a. Number	1	2
b. Total annual deferred benefits	\$ 96,307	\$ 210,812
c. Average annual deferred benefit	\$ 96,307	\$ 105,406
3. Nonvested inactive members		
a. Number	3	4
b. Member contributions with interest	\$ 78,394	\$ 125,991
c. Average contributions with interest	\$ 26,131	\$ 31,498
4. Service retirees		
a. Number ¹	162	156
b. Total annual benefits	\$ 22,952,047	\$ 22,168,549
c. Average annual benefit	\$ 141,679	\$ 142,106
d. Average age at the valuation date	73.2	72.8
e. Average age at retirement date	60.4	60.2
5. 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
e. Average age at retirement date	N/A	N/A
6. Beneficiaries		
a. Number	61	61
b. Total annual benefits	\$ 2,267,549	\$ 2,242,354
c. Average annual benefit	\$ 37,173	\$ 36,760
d. Average age at the valuation date	70.9	70.4

¹ Includes eighteen members that are retired in place. Total membership at June 30, 2020 and June 30, 2019 is 369 and 363, respectively.

² Based on filled and unfilled positions.

³ Total and average contributions and interest statistics exclude members in DROP and Retired in Place.



Summary of Historical Active Membership

July 1, (1)	Active Members		Covered Payroll	Average Annual Pay		Average Age (7)	Average Service (8)
	Number of Employers (2)	Number ¹ (3)	Amount in Thousands ¹ (4)	Amount (5)	Percent Increase /(Decrease) (6)		
2006	2	128	15,929	124,445	3.00%	55.0	20.0
2007	2	128	16,407	128,176	3.00%	55.0	19.0
2008	3	144	18,661	129,590	1.10%	54.0	15.0
2009	3	144	18,661	129,590	0.00%	55.0	15.4
2010	3	144	18,661	129,590	0.00%	54.9	15.0
2011	3	144	18,661	129,590	0.00%	55.1	14.3
2012	3	144	19,221	133,476	3.00%	55.6	15.1
2013	3	153	20,407	133,381	-0.07%	56.0	15.5
2014	3	153	20,815	136,048	2.00%	56.3	15.1
2015	4	157	21,267	133,756	0.28%	56.5	15.1
2016	4	157	21,958	139,861	4.56%	57.2	15.4
2017	4	160	22,347	139,666	-0.14%	57.4	15.4
2018	4	160	22,347	139,666	0.00%	57.1	15.0
2019	4	160	30,346	189,662	35.80%	57.4	15.4
2020	4	160	30,346	189,662	0.00%	57.2	15.8

¹ Includes filled and unfilled positions and members in DROP or Retired-in-Place.

Distribution of Active Members by Age and by Years of 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	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 20	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
20-24	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
25-29	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
30-34	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
35-39	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$186,902	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$186,902
40-44	1 \$138,102	2 \$186,137	1 \$186,902	1 \$186,902	0 \$0	4 \$190,691	2 \$191,954	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	11 \$184,623
45-49	2 \$138,102	2 \$189,428	2 \$189,428	0 \$0	1 \$186,902	0 \$0	3 \$188,586	2 \$191,954	2 \$191,954	0 \$0	0 \$0	0 \$0	14 \$182,457
50-54	4 \$146,408	0 \$0	2 \$191,954	1 \$191,954	2 \$186,902	5 \$189,933	3 \$186,902	4 \$178,491	8 \$191,322	3 \$191,954	0 \$0	0 \$0	32 \$183,315
55-59	3 \$149,177	0 \$0	1 \$153,563	1 \$191,954	0 \$0	11 \$185,249	2 \$186,902	6 \$190,270	5 \$185,286	6 \$192,796	1 \$191,954	0 \$0	36 \$183,927
60-64	0 \$0	0 \$0	2 \$186,902	0 \$0	0 \$0	9 \$186,453	4 \$193,217	3 \$190,270	3 \$191,954	5 \$191,954	2 \$194,479	0 \$0	28 \$190,005
65 & Over	0 \$0	0 \$0	1 \$186,902	0 \$0	1 \$153,563	1 \$191,954	8 \$190,059	0 \$0	5 \$188,923	4 \$191,954	0 \$0	0 \$0	20 \$188,266
Total	10 \$144,747	4 \$187,783	9 \$184,882	3 \$190,270	4 \$178,567	30 \$187,340	23 \$189,757	15 \$187,353	23 \$189,626	18 \$192,235	3 \$193,637	0 \$0	142 \$185,529

Information shown above is for members in JSRS earning retirement benefits. It does not include unfilled positions or members that are retired-in-place.

Distribution of Annuitants by Monthly Benefit

Monthly Benefit Amount (1)	Number of Annuitants (2)	Female (3)	Male (4)	Average Service (5)
Under \$500	0	0	0	0.00
\$ 500 - 999	10	4	6	25.37
1,000 - 1,499	5	5	0	22.85
1,500 - 1,999	3	0	3	29.22
2,000 - 2,499	2	2	0	8.75
2,500 - 2,999	1	1	0	16.75
3,000 - 3,499	4	4	0	25.69
3,500 - 3,999	22	22	0	19.53
4,000 - 4,499	6	5	1	26.00
4,500 - 4,999	10	10	0	31.23
5,000 - 5,499	3	2	1	20.50
5,500 - 5,999	2	1	1	22.21
6,000 - 6,499	2	1	1	13.29
6,500 - 6,999	2	0	2	19.63
7,000 - 7,499	2	1	1	15.04
7,500 - 7,999	1	1	0	16.50
8,000 - 8,499	3	1	2	22.53
8,500 - 8,999	3	1	2	19.75
9,000 - 9,499	5	0	5	18.63
9,500 - 9,999	1	0	1	20.08
10,000 - 10,499	4	0	4	21.81
10,500 - 10,999	1	0	1	0.00
11,000 - 11,499	41	5	36	0.61
11,500 & Over	90	8	82	24.99
Total	223	74	149	19.33

Average age at retirement for service retirees as of July 1, 2020 is age 60.4.

Schedule of Retirants Added to and Removed from Rolls
(Dollar amounts except average allowance expressed in thousands)

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 (3)	Number (4)	Annual Benefits (5)	Number (6)	Annual Benefits (7)		
2006	4	464	1	28	144	10,051	4.5%	69,799
2007	32	2,690	1	30	175	12,711	26.5%	72,634
2008	6	545	3	156	178	13,100	3.1%	73,596
2009	10	903	4	259	184	13,744	4.9%	74,696
2010	18	1,210	8	593	194	14,361	4.5%	74,025
2011	9	827	5	196	198	14,992	4.4%	75,717
2012	6	912	4	184	200	15,720	4.9%	78,600
2013	10	279	9	42	201	15,957	1.5%	79,388
2014	7	637	4	192	204	16,402	2.8%	80,402
2015	8	757	6	497	206	16,662	1.6%	80,883
2016	10	1,355	6	300	210	17,717	6.3%	84,367
2017	7	535	4	352	213	17,900	1.0%	84,038
2018	11	734	11	792	213	17,842	-0.3%	83,765
2019	8	6,828	4	259	217	24,411	36.8%	112,493
2020	12	1,345	6	536	223	25,220	3.3%	113,094

Beginning July 1, 2007, includes participants who have retired in place.

Annual benefits added to rolls include benefit increases for continuing retirees.

The removed from rolls count does not include members who are replaced by beneficiaries.



SECTION E

ASSESSMENT AND DISCLOSURE OF RISK

Risks Associated with Measuring the Accrued Liability And Actuarially Determined Contribution

(As Required by ASOP No. 51)

The determination of JSRS's accrued liability, actuarially determined contribution, and calculated funding period requires the use of assumptions regarding future economic and demographic experience. The risk measures illustrated in this section are intended to aid stakeholders in understanding the effects when future experience differs from the assumptions used in performing an actuarial valuation. These risk measures may also help with illustrating the potential volatility in the funded status and actuarially determined contributions that result from differences between actual experience and the expected experience based on the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience (economic and demographic) differing from the assumptions, changes in assumptions due to changing conditions, changes in contribution requirements due to modifications to the funding policy, and changes in the liability and cost due to changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risks that may reasonably be anticipated to significantly affect the System's future financial condition include:

- Investment risk – actual investment returns may differ from expected returns;
- Longevity risk – members may live longer or shorter than expected and receive pensions for a time period different than assumed;
- Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liabilities and contributions differing from expected;
- Salary and payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liabilities and contributions differing from expected;
- Asset/Liability mismatch – changes in assets may be inconsistent with changes in liabilities, thereby altering the relative difference between the assets and liabilities, which may alter the funded status and contribution requirements;
- Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions are not made in accordance with the System's funding policy or Statute, other anticipated payments to the plan are not made, or material changes occur in the anticipated number of covered employees, covered payroll, or another relevant contribution base.

On the other hand, effects of certain experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate of return, the funded status of the plan can be expected to decrease (or increase) more than anticipated.

Under South Carolina State Code, the Board must certify the employer contribution annually. This amount is determined actuarially, based on the Board's funding policy.

Employer Risk with Contribution Rates

The funding policy is intended to finance the unfunded actuarial accrued liability over a reasonable time period and provide stability in the employer contribution rates so employers are better able to budget their pension cost in future years. The greater the difference between the contribution rate in effect versus the minimum contribution rate specified by the maximum funding period specified by the Board's funding policy, the greater the ability for the System to incur some adverse experience without requiring an increase in the employer contribution rate.

However, providing stability in the contribution rates means that projecting the year the fund actually attains a 100% funded ratio becomes less certain. If actual experience is more favorable than assumed, then the year the fund attains a 100% funded ratio will be earlier than projected, but the projected year the fund attains a 100% funded ratio will be later than projected if actual experience is less favorable than assumed.

Plan Maturity Measures

Risks faced by a pension plan evolve over time. A relatively new plan with virtually no assets and paying few benefits will experience lower investment risk than a mature plan with a significant amount of assets and large number of members receiving benefits. There are a few measures that can assist stakeholders in understanding and comparing the maturity of a plan to other systems, which include:

- Ratio of market value of assets to payroll: The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. If assets are approximately the same as covered payroll, an investment return that is 5% different than assumed would equal 5% of payroll. In another example, if the assets are approximately twice as large as covered payroll, an investment return that is 5% different than assumed would equal 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.
- Ratio of actuarial accrued liability to payroll: The ratio of actuarial accrued liability to payroll can be used as a measure to indicate the potential volatility of contributions due to volatility in the liability experience. For instance, if the actuarial accrued liability is 5 times the size of the covered payroll, then a change in the liability that is 2% different than expected would be a change in magnitude that is 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.

- Ratio of active to retired members: A relatively mature open plan is likely to have close to the same number of actives to retirees resulting in a ratio that is around 1.0. On the other hand, a super-mature plan, or a plan that is closed to new entrants will have more retirees than active members resulting in a ratio below 1.0. As this ratio declines, a larger portion of the total actuarial accrued liability in the System is attributable to retirees. This metric also typically moves in tandem with the liability to payroll metric, which provides an indication of potential contribution volatility.
- Ratio of net cash flow to market value of assets: A negative net cash flow means that benefit payments exceed contributions and the plan is depending on investment earnings and possibly existing funds to make payments to retirees. A certain amount of negative net cash flow is expected to occur when benefits are prefunded and the plan has matured. However, a relatively large negative net cash flow as a percent of assets may be an indication of the need for additional contributions for a plan with a low funded ratio.

The following exhibit provides a summary of these measures for JSRS. We have also included these metrics for the prior four years so stakeholders can identify how these measures are trending.

	July 1,				
	2020	2019	2018	2017	2016
Ratio of the market value of assets to total payroll	5.45	5.47	7.16	6.81	6.41
Ratio of actuarial accrued liability to payroll	13.68	13.17	13.15	13.23	12.91
Ratio of actives to retirees and beneficiaries	0.64	0.65	0.65	0.63	0.64
Ratio of net cash flow to market value of assets	1.1%	-2.0%	-2.3%	-3.2%	-3.3%

Note: For purposes of this analysis, payroll includes the payroll received by working retirees since the System receives contributions on that payroll.

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Assumptions and Methods

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

Investment Rate of Return

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

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

Rates of Annual Salary Increase

Rates of salary are assumed to increase at an annual rate of 2.75%.

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, all participants are assumed to retire upon reaching the mandatory retirement age of 72.

Service Based Retirement Rates		
Years of Service	Male	Female
15-19	10.00%	10.00%
20-24	40.00%	40.00%
25-31	15.00%	15.00%
32+	100.00%	100.00%

*Retirement rate will be 100% at 31 years of service for solicitors and public defenders.

- b. An abbreviated table with the assumed rates of disability incidence and pre-retirement mortality is shown below. The pre-retirement mortality assumption is based upon the RP-2014 Mortality Table for Employees with applicable multipliers to better reflect anticipated experience and provide margin for future improvement in mortality.

Age	Disability Incidence Rates		Pre-Retirement Mortality	
	Males	Females	Males	Females
25	0.0419%	0.0458%	0.0460%	0.0147%
30	0.0629%	0.0616%	0.0429%	0.0185%
35	0.0838%	0.0616%	0.0497%	0.0243%
40	0.1572%	0.1074%	0.0597%	0.0337%
45	0.2620%	0.2200%	0.0924%	0.0558%
50	0.4192%	0.3520%	0.1602%	0.0937%
55	0.6812%	0.5720%	0.2649%	0.1422%
60	1.0480%	0.8800%	0.4454%	0.2076%
Multiplier	105%	88%	95%	85%

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

- c. There is no active employment withdrawal assumption.

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, both 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	0.1875%	0.1284%
55	0.2949%	0.2177%
60	0.5394%	0.3765%
65	0.9382%	0.5230%
70	1.4461%	0.8511%
75	2.5019%	1.6363%
80	4.6454%	3.2910%
85	8.4266%	6.2277%
90	14.6319%	10.9026%
Multiplier	92%	98%

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

The table on the following page 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	21.2	21.5	21.9	22.2
Female	23.6	23.8	24.0	24.1

- 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 2016 and with multipliers based on plan experience. The following are sample rates:

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 percent of payroll 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.

The calculation of the amortization period takes into account budgeted non-payroll based contributions. Also, the calculation of the amortization period reflects additional contributions the System receives with respect to members in DROP and who are retired-in-place. These contributions are assumed to grow at the same payroll growth rate as for active employees. It is assumed that amortization payments are made monthly at the end of the month.

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

Future benefits are assumed to increase at an annual rate of 2.75%.

Payroll Growth Rate

The total annual payroll of active members (including DROP and retired in place participants) is assumed to increase at an annual rate of 2.75%. This rate represents the underlying expected annual rate of wage inflation and does not anticipate increases in the number of members.

Other Assumptions

1. The normal cost rate is increased by 0.12% to account for administrative expenses that are paid with plan assets.
2. Percent married: 95% of male and female employees 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 deferred benefit commencing at their earliest possible commencement age.
5. 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 members are assumed to accrue one year of 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.

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APPENDIX B

BENEFIT PROVISIONS

Summary of Benefit Provisions for Retirement System for Judges and Solicitors for the State of South Carolina Retirement System (JSRS)

Effective Date: July 1, 1979.

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 and considered to be a single employer plan under GASB Statement No. 67.

Eligibility: This System covers all solicitors, circuit public defenders, judges of a Circuit or Family Court, justices of the Court of Appeals, and Supreme Court judges, unless exempted by statute. Administrative Law Judges who elect to participate in the System are also eligible to earn retirement benefits in the System.

Employee Contributions: Members contribute 10.00% of compensation per year. Contributions are credited with interest at the rate of 4.0% per annum.

Service Retirement:

- a. **Eligibility:** There is a mandatory retirement age of 72. Members may retire if they have met one of the following eligibility conditions:
 - i. Age 65 with 20 years of credited service.
 - ii. Age 70 with 15 years of credited service.
 - iii. Completed 25 years of credited service as a judge or 24 years as a solicitor or public defender.
- b. **Monthly Benefit:** The monthly benefit is equal to one-twelfth ($1/12^{\text{th}}$) of the member's current salary, times 71.3% plus 2.67% of pay for each year of credited service beyond 25 for judges and 24 for solicitors and public defenders. The monthly benefit may not exceed one-twelfth of 90% of the member's current salary.
- c. **Payment Form:** Standard Annuity Payment.

A JSRS member whose annuity as calculated at retirement exceeds the 90 percent maximum annuity will receive an additional lump-sum benefit at retirement. The additional benefit is equal to the member's contributions and interest paid in to the system after the member attained sufficient service credit to be eligible to receive the maximum annuity of 90 percent of the current active salary. The 90 percent maximum annuity amount is generally reached when the following JSRS service credit is obtained: 32 years for justices and judges; and 31 years for solicitors and circuit public defenders.



Disability Retirement:

- a. Eligibility: Member must have five or more years of earned service.
- b. Monthly Benefit: The monthly disability benefit payable is determined the same as a service retirement benefit and payable immediately.
- 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: Judges are vested in the system after attaining ten (10) years of earned service. Solicitors and public defenders are vested in the system after attaining eight (8) years of earned 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 and must elect to leave his/her contributions on deposit. Members who began service before July 1, 2004 are eligible for a monthly benefit beginning at age 55. Members hired after July 1, 2004 are eligible to commence their deferred monthly benefit at age 65.
- b. Monthly Benefit: The member's benefit is determined by multiplying the base benefit by a fraction, in which the numerator is the member's total credited service and twenty-four is the denominator.
- 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). A beneficiary of an inactive member who was eligible to commence his retirement annuity at the time of his death may elect a monthly survivor annuity equal to one-third the annuity that would have been payable to the deceased member.

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 was married and eligible to commence his retirement annuity at the time of his death, then his beneficiary may elect a monthly survivor annuity equal to one-third the annuity that would have been payable to the deceased member.

Standard Annuity Payment: The monthly retirement benefit will be paid as follows. Other reduced optional forms of payment are also available to a member to elect at retirement.

- a. Unmarried Retiree: A life annuity. Upon the member's death, any remaining member contributions plus interest will be paid to the member's designated beneficiary.
- b. Married Retiree (One-third Joint & Survivor): An unreduced annuity is payable during the member's life, and continues after the member's death at one-third of the rate paid to the member for the life of the surviving spouse, unless a contingent non-spousal beneficiary is named.
- c. Optional Allowance: A reduced lifetime annuity is payable during the member's life, and continues after the member's death at one-third of the rate paid to the member for the life of the non-spousal beneficiary (or in equal shares to multiple beneficiaries).

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

Retire in Place: Members who have accrued their maximum monthly benefit (i.e. 90% of salary) may elect to "retire in place". These members will receive their monthly retirement benefit while they remain employed. Members who retire in place under the age of 60 will have his retirement benefit accumulated into a deferred retirement option program (DROP). These members will receive a distribution of their DROP balance upon reaching the age of 60 or retirement (if earlier).

Postretirement Benefit Increases: Benefits paid to retired members or surviving spouses are increased annually by an amount equal to the percentage increase in the current salary paid to the respective position from which the member retired. The cost of living adjustment for non-spousal beneficiaries is based on the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), and said beneficiaries will receive a 4.00% increase in their benefit in years in which the annual increase in CPI-W exceeds 3.00%.

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, non-retired 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.

Decrements: 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 may not decrease by exactly one year in the subsequent year's actuarial valuation. In some instances, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In other instances, such as the case with the South Carolina Retirement System (SCRS), Police Officers Retirement System (PORS), and the Retirement System for Judges and Solicitors (JSRS) the amortization period denotes the expected number of years until the plan attains a 100% funded ratio (on an actuarial value of asset basis), based on the contribution rate that is in effect. In this instance, the amortization period may "float" from year to year, meaning it could increase, decrease, or remain relatively unchanged from the amortization period in the prior year's valuation.

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.

DRAFT

South Carolina National Guard Supplemental Retirement Plan (SCNG)

Actuarial Valuation Report
As of July 1, 2020





November 24, 2020

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

Subject: Actuarial Valuation as of July 1, 2020

Dear Members of the Board:

This report describes the current actuarial condition of the South Carolina National Guard Supplemental Retirement Plan (SCNG), 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 SCNG. 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 contribution is determined by a given actuarial valuation and becomes effective twelve months after the valuation date. In other words, the contribution amount determined by this July 1, 2020 actuarial valuation will be used by the Board when certifying the employer contribution amount for the year beginning July 1, 2021. If new legislation is enacted between the valuation date and the date the contribution becomes effective, the Board may adjust the calculated amount before certifying them, in order 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 16-years remaining in the funding period of the experience gains and losses).

The contribution amounts are based on the Board's current funding policy, which is expected to completely amortize the unfunded actuarial accrued liability by June 30, 2036.

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 System increased from 46.8% at July 1, 2019 to 50.0% as of July 1, 2020. If 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 been increased from 46.1% in 2019 to 46.7% in 2020. The increase in the funded ratios on both asset measures is primarily due to the current contribution effort to finance the unfunded actuarial accrued liability.

Plan assets earned a -1.58% return on a time weighted-basis (net of fees) as reported in the financial statement of the South Carolina Retirement Systems for the year ending June 30, 2020. The -1.1% return documented in this report was determined on a dollar-weighted basis and assumes mid-year cash flows.

ASSUMPTIONS AND METHODS

There were no assumption changes since the prior actuarial valuation. These assumptions are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that that assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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.

This report was prepared using our proprietary valuation model and related software, which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2020. There have been no changes in plan provisions since the preceding actuarial valuation.



DATA

Member data for retired, active and inactive members was supplied as of July 1, 2020, by the PEBA staff. The staff also supplied asset information as of July 1, 2020. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable for use in preparing the actuarial valuation. GRS is not responsible for the accuracy or completeness of the information provided to us by PEBA.

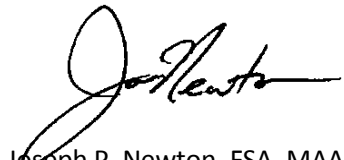
CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of SCNG as of July 1, 2020.

All of our work conforms with generally accepted actuarial principles and practices and complies 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. All three are also Enrolled Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. Each are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.



Joseph P. Newton, FSA, MAAA, EA
Pension Market Leader and Actuary



Daniel J. White, FSA, MAAA, EA
Senior Consultant



Thomas Lyle, FSA, MAAA, EA
Consultant



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SECTION A

EXECUTIVE SUMMARY

Executive Summary

(Dollar amounts expressed in thousands)

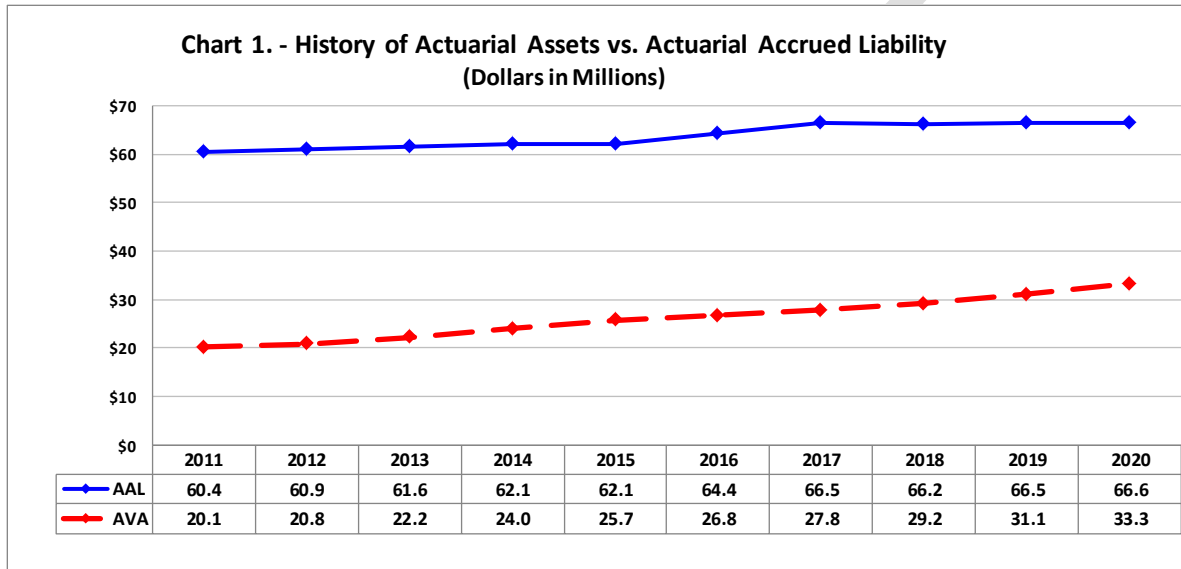
Valuation Date:	July 1, 2020	July 1, 2019
Membership <ul style="list-style-type: none"> Number of <ul style="list-style-type: none"> - Active Members - Retirees - Inactive Members - Total 	12,099 4,981 1,739 <hr/> 18,819	12,100 4,923 1,823 <hr/> 18,846
Annual Required Contribution <ul style="list-style-type: none"> Member Employer contribution¹ 	\$0 \$4,405	\$0 \$5,188
Assets <ul style="list-style-type: none"> Market value Actuarial value Return on market value Return on actuarial value Ratio - actuarial value to market value External cash flow % 	\$31,092 33,299 -1.1% 4.5% 107.1% 2.5%	\$30,683 31,122 5.6% 3.8% 101.4% 2.6%
Actuarial Information <ul style="list-style-type: none"> Normal cost Actuarial accrued liability (AAL) Unfunded actuarial accrued liability (UAAL) Funded ratio Amortization period² 	\$821 66,597 33,298 50.0% 16	\$820 66,523 35,401 46.8% 17
Reconciliation of UAAL <ul style="list-style-type: none"> Beginning of Year UAAL - Interest on UAAL - Amortization payment - Assumption/method changes - Asset experience - Other liability experience - Legislative changes End of Year UAAL 	\$35,401 2,567 (4,633) 0 868 (905) 0 <hr/> 33,298	\$36,946 2,679 (4,652) 0 1,011 (583) 0 <hr/> \$35,401

¹ The contribution amount determined by the actuarial valuation is effective for the following fiscal year. The calculated contribution amount for FY 2020 was \$5,188 thousand, however the state appropriations were \$5,290 thousand.

² As of July 1, 2020, there is one year remaining in the amortization of the unfunded liability attributable to the 2006 legislation change and 16 years remaining in the amortization of the unfunded liability due to other plan experience.

Executive Summary (Continued)

The unfunded actuarial accrued liability decreased by \$2.1 million since the prior year's valuation to \$33.3 million. The single largest source of this decrease is due the State's contribution to finance the unfunded actuarial accrued liability followed by favorable liability experience. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for SCNG.



There is \$2.2 million in deferred investment losses as of the valuation date (i.e. the difference between the actuarial value of assets and the market value of assets as of July 1, 2020). Absent favorable investment experience, those losses will be reflected in the actuarial value of assets over the next four year. On the other hand, due to the Board's funding policy to finance the unfunded actuarial accrued liability over a closed period, we expect the unfunded actuarial liability for the System and the funded ratio to steadily improve in future years.

The recommended employer contribution decreased by \$0.783 million dollars to \$4.405 million for the fiscal year ending June 30, 2021 due the amortization base attributable to the 2006 plan change that reopened membership into the System becoming fully amortized. Absent legislative changes or liability and investment experience that are significantly different than assumed, we expect the contribution requirement to be relatively stable.

SECTION B

DISCUSSION

Discussion

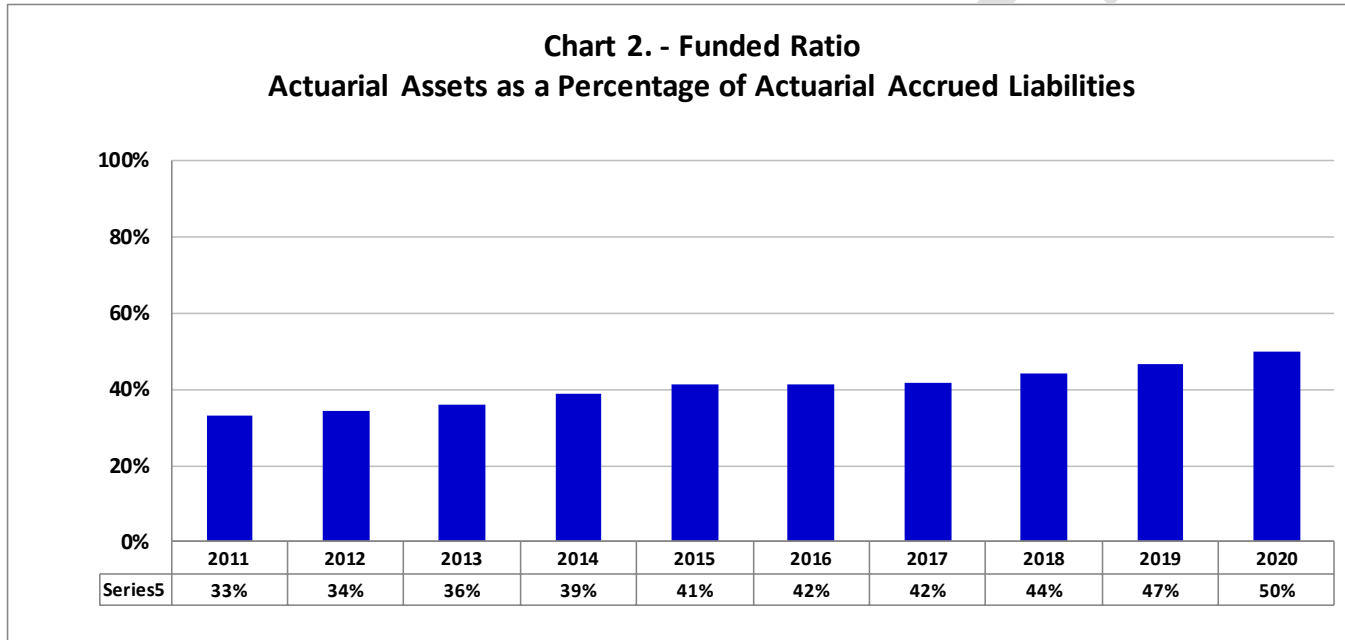
The results of the July 1, 2020 actuarial valuation of the South Carolina National Guard Supplemental Retirement Plan are presented in this report. The purposes of the valuation report are to depict the current financial condition of the System, determine the annual required contribution, and analyze 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.

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. Section E is new this year and provides an assessment and disclosure of risk as required by Actuarial Standards of Practice No. 51. 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 increased from 46.8% to 50.0% since the prior valuation and has generally trended slightly upward over the last several years as shown in the graph below. Table 10, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.



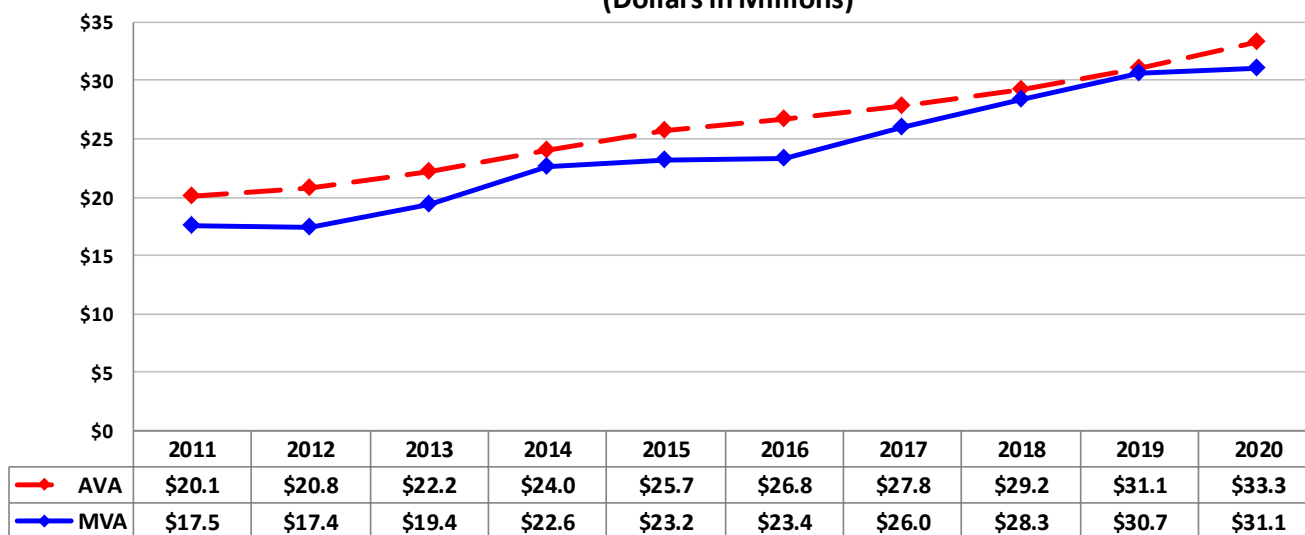
The contribution policy established by the Board is to fully amortize the unfunded actuarial accrued liability (UAAL) over a 30 year period from July 1, 2006. Under this funding policy, there are 16 years remaining in the funding period from the valuation date. The total State appropriation required to be made for FY 2021 is \$4,405,123.

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 increased from \$31.1 million to \$33.3 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 fiscal year 2020 was -1.1%, which is less than the 7.25% investment return assumption. However, because of the offset and recognition of deferred investment losses that occurred in prior years, the actuarial (smoothed) asset value returned is 4.5%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

**Chart 3. - History of Actuarial Value and Market Value of Assets
(Dollars in Millions)**



Assets as of July 1,

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 \$35.401 million in 2019 to \$33.298 million in 2020. 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	\$35,401
- Interest on UAAL	2,567
- Amortization payment	(4,633)
- Assumption / method change	0
- Asset experience	868
- Liability experience	(905)
- Legislative changes	0
- Total change	(\$2,103)
• End of Year UAAL	\$33,298

The plan experienced a net \$0.9 million gain due to demographic experience. This net gain is approximately 1.4% of the total actuarial accrued liability.

The following table provides a reconciliation of the change in the recommended contribution from the 2019 valuation to the 2020 valuation. The expected \$781 thousand dollar decrease in the contribution requirement is attributable to fully amortizing the 2006 plan change that reopened the System to new members.

Change in Recommended Contribution	
• Prior year valuation	\$5,188
- Expected change	(781)
- Assumption / method change	0
- Asset experience	93
- Liability experience	(95)
- Legislative changes	0
- Total change	(\$783)
• Current year valuation	\$4,405

Absent changes in plan provisions and assumptions, we expect future contributions requirements to remain relatively constant for the several years.

Actuarial Assumptions and Methods

In determining costs and liabilities, actuaries use assumptions about the future, such as probabilities of retirement, termination, death and disability, and an annual investment return assumption. The assumptions used in this actuarial valuation are based on an experience study conducted as of June 30, 2015. An experience study was subsequently performed as of June 30, 2019 and the Board has accepted that report as information for possible adoption and for first use in the July 1, 2021 actuarial valuation. Based on the results of the analysis in the 2019 experience study, it is our professional opinion that that assumptions used in performing the July 1, 2020 actuarial valuation remain consistent and reasonably reflect the anticipated future experience of the System. The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and the current 7.25% investment return assumption will expire on July 1, 2021.

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 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 SCNG. There have been no changes in the benefit provisions since the prior valuation.

Summary of Retirement Provisions

- All members of the South Carolina National Guard are covered by the Supplemental Retirement Plan.
- The retirement benefit amount is equal to \$50 per month for 20 years' creditable service with an additional \$5 per month for each additional year of service. The total pension is limited to \$100 per month.
- Members with 20 years of military service are eligible for retirement after they have (i) attained age 60, or (ii) completed 30 years of creditable service. Eligible member may commence benefits at age 60.
- Member contributions are not required or permitted.

SECTION C

ACTUARIAL TABLES

Actuarial Tables

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Summary of Cost Items
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)	July 1, 2019 (2)
1. Normal Cost		
a. Total normal cost	\$ 821	\$ 820
b. Less: member contribution	0	0
c. Employer normal cost	\$ 821	\$ 820
2. Actuarial Accrued Liability for Active Members		
a. Present value of future benefits	\$ 27,484	\$ 27,285
b. Less: present value of future normal costs	7,481	7,472
c. Actuarial accrued liability	\$ 20,003	\$ 19,813
3. Total Actuarial Accrued Liability		
a. Retirees	\$ 35,756	\$ 35,589
b. Inactive members	10,838	11,121
c. Active members (Item 2.c.)	20,003	19,813
d. Total	\$ 66,597	\$ 66,523
4. Actuarial Value of Assets	\$ 33,299	\$ 31,122
5. Unfunded Actuarial Accrued Liability (UAAL) (Item 3.d. - Item 4.)	\$ 33,298	\$ 35,401
6. Annual Required Contribution		
a. Normal cost	\$ 821	\$ 820
b. Amortization of the UAAL	3,584	4,368
c. Total contribution	\$ 4,405	\$ 5,188

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

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Service retirement	\$ 4,582	\$ 4,126
b. Deferred termination benefits ¹	22,902	23,159
c. Survivor benefits	0	0
d. Disability benefits	0	0
e. Total	<u>\$ 27,484</u>	<u>\$ 27,285</u>
2. Retired and Inactive members		
a. Members in payment status	\$ 35,756	\$ 35,589
b. Inactive vested members	10,838	11,121
c. Total	<u>\$ 46,594</u>	<u>\$ 46,710</u>
3. Total actuarial present value of future benefits	\$ 74,078	\$ 73,995

¹ Attributable to members who terminate after attaining 20 years of service and prior to age 60, the age when retirement benefits commence.

Analysis of Normal Cost
(Dollar amounts expressed in thousands)

	<u>July 1, 2020</u> (1)	<u>July 1, 2019</u> (2)
1. Total normal cost		
a. Retirement benefits	\$ 105	\$ 103
b. Deferred termination benefits	701	702
c. Survivor benefits	0	0
d. Disability benefits	0	0
e. Total	<u>806</u>	<u>805</u>
2. Administrative expense	\$ 15	\$ 15
3. Less: member contributions	<u>\$ 0</u>	<u>\$ 0</u>
4. Net employer normal cost	\$ 821	\$ 820

Results of July 1, 2020 Valuation
(Dollar amounts expressed in thousands)

	July 1, 2020 (1)
1. Actuarial Present Value of Future Benefits	
a. Present Retired Members	\$ 35,756
b. Present Active and Inactive Members	38,322
c. Total Actuarial Present Value	\$ 74,078
2. Present Value of Future Normal Contributions	
a. Member	\$ 0
b. Employer	7,481
c. Total Future Normal Contributions	\$ 7,481
3. Actuarial Liability	\$ 66,597
4. Current Actuarial Value of Assets	\$ 33,299
5. Unfunded Actuarial Liability	\$ 33,298
6. Unfunded Actuarial Liability Liquidation Period ¹	16 years

¹ There is one year remaining in the amortization of the unfunded liability attributable to due to the 2006 legislation change and 16 years remaining in the amortization of the unfunded liability due to other plan experience. The disclosure of a 16 year funding period is for stakeholders to understand when the system is expected to attain a 100% funded ratio.

Actuarial Balance Sheet
(Dollar amounts expressed in thousands)

	<u>July 1, 2020</u> (1)	<u>July 1, 2019</u> (2)
1. Assets		
a. Current assets (actuarial value)	\$ 33,299	\$ 31,122
b. Present value of future member contributions	0	0
c. Present value of future employer contributions		
i. Normal contributions	\$ 7,481	\$ 7,472
ii. Accrued liability contributions	33,298	35,401
iii. Total future employer contributions	<u>\$ 40,779</u>	<u>\$ 42,873</u>
d. Total assets	\$ 74,078	\$ 73,995
2. Liabilities		
a. Benefits to be paid to retired members	\$ 35,756	\$ 35,589
b. Benefits to be paid to former members entitled to deferred pensions	10,838	11,121
c. Benefits to be paid to current active members	<u>27,484</u>	<u>27,285</u>
d. Total liabilities	\$ 74,078	\$ 73,995

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

Item (1)	July 1, 2020 (2)	July 1, 2019 (3)
1. Cash and cash equivalents (operating cash)	\$ 7,495	\$ 5,802
2. Receivables	1,244	1,244
3. Investments		
a. Short-term securities	\$ 277	\$ 340
b. Fixed income (global)	3,265	3,896
c. Global public equity	11,888	9,818
d. Opportunistic	195	2,298
e. Alternative investments	9,116	8,567
f. Total investments	\$ 24,741	\$ 24,919
4. Securities lending cash collateral invested	\$ 17	\$ 35
5. Prepaid administrative expenses	1	3
6. Capital assets, net of accumulated depreciation	0	0
7. Total assets	\$ 33,498	\$ 32,003
8. Liabilities		
a. Due to other systems	\$ 0	\$ 0
b. Accounts payable	2,172	1,081
c. Investment fees payable	7	10
d. Obligations under securities lending	17	35
e. Deferred retirement benefits	0	0
f. Due to employee insurance program	0	0
g. Benefit payable	2	17
h. Other liabilities	208	177
i. Total liabilities	\$ 2,406	\$ 1,320
9. Total market value of assets available for benefits (Item 7. - Item 8.i.)	\$ 31,092	\$ 30,683
10. Asset allocation (investments) ¹		
a. Net Invested cash	21.3%	19.9%
b. Fixed income	10.5%	12.7%
c. Public equities	38.3%	32.0%
d. Global tactical asset allocation	0.6%	7.5%
e. Alternative investments	29.3%	27.9%
f. Total investments	100.0%	100.0%

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, 2020 (1)	July 1, 2019 (2)
1. Value of assets at beginning of year	\$ 30,683	\$ 28,327
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 0	\$ 0
ii. Employer contributions	5,290	5,290
iii. Total	\$ 5,290	\$ 5,290
b. Income		
i. Interest, dividends, and other income	\$ 615	\$ 638
ii. Investment expenses	(198)	(279)
iii. Net	\$ 417	\$ 359
c. Net realized and unrealized gains (losses)	(769)	1,257
d. Total revenue	\$ 4,938	\$ 6,906
3. Expenditures for the year		
a. Disbursements		
i. Refunds	\$ 0	\$ 0
ii. Regular annuity benefits	4,514	4,534
iii. Other benefit payments	0	0
iv. Transfers to other Systems	0	0
v. Total	\$ 4,514	\$ 4,534
b. Administrative expenses and depreciation	15	16
c. Total expenditures	\$ 4,529	\$ 4,550
4. Increase in net assets (Item 2.d.- Item 3.c.)	\$ 409	\$ 2,356
5. Value of assets at end of year (Item 1. + Item 4.)	\$ 31,092	\$ 30,683
6. Net external cash flow		
a. Dollar amount	\$ 776	\$ 756
b. Percentage of market value	2.5%	2.6%



Development of Actuarial Value of Assets (Dollar amounts expressed in thousands)

				Year Ending June 30, 2020
1.	Actuarial value of assets at beginning of year	\$		31,122
2.	Market value of assets at beginning of year	\$		30,683
3.	Net new investments			
a.	Contributions	\$		5,290
b.	Disbursements			(4,529)
c.	Subtotal			761
4.	Market value of assets at end of year	\$		31,092
5.	Net earnings (Item 4. - Item 2. - Item 3.c.)	\$		(352)
6.	Assumed investment return rate for fiscal year			7.25%
7.	Expected return (Item 6. x (Item 2. + 1/2 Item 3.c.))	\$		2,252
8.	Excess return (Item 5. - Item 7.)	\$		(2,604)
9.	Excess return on assets as of June 30, 2020:			
	<u>Fiscal Year</u> <u>Ending June 30,</u> (1)	<u>Excess</u> <u>Return</u> (2)	<u>Percent</u> <u>Deferred</u> (3)	<u>Deferred</u> <u>Amount</u> (4)
a.	2020	\$	(2,604)	80%
b.	2019		(465)	60%
c.	2018		0	40%
d.	2017		776	20%
e.	2016		(1,884)	0%
f.	Total			
10.	Actuarial value of assets as of June 30, 2020 (Item 4. - Item 9.f.)	\$		33,299
11.	Expected actuarial value as of June 30, 2020	\$		34,167
12.	Asset gain (loss) for year (Item 10. - Item 11.)	\$		(868)
13.	Asset gain (loss) as % of the actuarial value of assets			-2.6%
14.	Ratio of actuarial value to market value			107.1%

Estimation of Yields
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2020 (1)	July 1, 2019 (2)
1. Market value yield		
a. Beginning of year market assets	\$ 30,683	\$ 28,327
b. Contributions to fund during the year	5,290	5,290
c. Disbursements	(4,529)	(4,550)
d. Investment income (net of investment expenses)	<u>(352)</u>	<u>1,616</u>
e. End of year market assets	\$ 31,092	\$ 30,683
f. Estimated dollar weighted market value yield	-1.1%	5.6%
2. Actuarial value yield		
a. Beginning of year actuarial assets	\$ 31,122	\$ 29,246
b. Contributions to fund during the year	5,290	5,290
c. Disbursements	(4,529)	(4,550)
d. Investment income (net of investment expenses)	<u>1,416</u>	<u>1,136</u>
e. End of year actuarial assets	\$ 33,299	\$ 31,122
f. Estimated actuarial value yield	4.5%	3.8%

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 (6)	UAAL as % of Payroll (4)/(6) (7)
2006	14,046	48,755	34,709	28.8%	N/A	N/A
2007	15,937	55,917	39,980	28.5%	N/A	N/A
2008	17,426	53,534	36,108	32.6%	N/A	N/A
2009	18,600	53,421	34,821	34.8%	N/A	N/A
2010	19,458	54,153	34,695	35.9%	N/A	N/A
2011	20,138	60,388	40,250	33.3%	N/A	N/A
2012	20,814	60,942	40,128	34.2%	N/A	N/A
2013	22,208	61,576	39,368	36.1%	N/A	N/A
2014	24,029	62,100	38,071	38.7%	N/A	N/A
2015	25,727	62,141	36,414	41.4%	N/A	N/A
2016	26,751	64,445	37,694	41.5%	N/A	N/A
2017	27,807	66,506	38,699	41.8%	N/A	N/A
2018	29,246	66,192	36,946	44.2%	N/A	N/A
2019	31,122	66,523	35,401	46.8%	N/A	N/A
2020	33,299	66,597	33,298	50.0%	N/A	N/A

Summary of Principle Assumptions and Methods

Below is a summary of the principle economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

Valuation date	July 1, 2020
Actuarial cost method	Entry Age Normal
Amortization method	Level dollar
Amortization period for recommended contribution	16-year closed period
Asset valuation method	5-Year Smoothing
Actuarial assumptions:	
Investment rate of return ¹	7.25%
Projected salary increases	None
Inflation	2.25%
Cost-of-living adjustments	0.00%
Retiree mortality	The 2016 Public Retirees of South Carolina Mortality Table projected at Scale AA from the year 2016. Male rates are multiplied by 125% 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, (1)	Actuarial Accrued Liability				Portion of Aggregate Accrued Liabilities Covered by Assets		
	Active Member Contributions	Retirants & Beneficiaries	Active & Inactive Members (Employer Financed)	Valuation Assets	Active	Retirants	ER Financed
	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2006	0	22,366	26,389	14,046	N/A	62.8%	0.0%
2007	0	24,627	31,290	15,937	N/A	64.7%	0.0%
2008	0	25,554	27,980	17,426	N/A	68.2%	0.0%
2009	0	27,558	25,863	18,600	N/A	67.5%	0.0%
2010	0	28,492	25,661	19,458	N/A	68.3%	0.0%
2011	0	32,038	28,350	20,138	N/A	62.9%	0.0%
2012	0	32,989	27,953	20,814	N/A	63.1%	0.0%
2013	0	33,590	27,986	22,208	N/A	66.1%	0.0%
2014	0	33,739	28,361	24,029	N/A	71.2%	0.0%
2015	0	33,521	28,620	25,727	N/A	76.7%	0.0%
2016	0	34,562	29,883	26,751	N/A	77.4%	0.0%
2017	0	35,391	31,115	27,807	N/A	78.6%	0.0%
2018	0	35,132	31,060	29,246	N/A	83.2%	0.0%
2019	0	35,589	30,934	31,122	N/A	87.4%	0.0%
2020	0	35,756	30,841	33,299	N/A	93.1%	0.0%

SECTION D

MEMBERSHIP INFORMATION

Membership Information

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Summary of Membership Data

	July 1, 2020 (1)	July 1, 2019 (2)
1. Active members		
a. Males	9,600	9,671
b. Females	2,499	2,429
c. Total members	12,099	12,100
d. Average age	32.2	32.2
e. Average service	9.7	9.7
2. Vested inactive members		
a. Number	1,739	1,823
b. Total annual deferred benefits	\$ 1,408,320	\$ 1,471,980
c. Average annual deferred benefit	\$ 810	\$ 807
3. Service retirees		
a. Number	4,981	4,923
b. Total annual benefits	\$ 4,514,760	\$ 4,464,960
c. Average annual benefit	\$ 906	\$ 907
d. Average age	71.7	71.5
e. Average age at retirement date	60.0	60.0

Summary of Historical Active Membership

July 1, (1)	Number of Employers (2)	Number of Members (3)	Annual Payroll (4)	Average Pay (5)	Percentage Increase in Average Pay (6)	Average Age (7)	Average Service (8)
2006	1	2,502	N/A	N/A	N/A	45	23
2007	1	11,076	N/A	N/A	N/A	32	10
2008	1	12,559	N/A	N/A	N/A	31	8
2009	1	12,599	N/A	N/A	N/A	31.7	8.7
2010	1	12,445	N/A	N/A	N/A	31.9	9.0
2011	1	12,271	N/A	N/A	N/A	32.0	9.3
2012	1	12,041	N/A	N/A	N/A	31.8	9.2
2013	1	11,997	N/A	N/A	N/A	32.0	9.5
2014	1	12,221	N/A	N/A	N/A	32.1	9.7
2015	1	12,165	N/A	N/A	N/A	32.2	9.7
2016	1	12,253	N/A	N/A	N/A	32.2	9.7
2017	1	12,116	N/A	N/A	N/A	32.3	9.8
2018	1	11,853	N/A	N/A	N/A	32.4	9.9
2019	1	12,100	N/A	N/A	N/A	32.2	9.7
2020	1	12,099	N/A	N/A	N/A	32.2	9.7

Distribution of Active Members by Age and by Years of Service

Attained Age	Years of Credited Service												Total
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30-34</u>	<u>35 & Over</u>	
Under 20	530	207	13	0	0	0	0	0	0	0	0	0	750
20-24	475	636	636	455	415	384	0	0	0	0	0	0	3,001
25-29	136	123	151	174	243	1,425	120	0	0	0	0	0	2,372
30-34	65	83	55	53	65	556	848	105	0	0	0	0	1,830
35-39	26	28	18	18	23	160	353	530	86	0	0	0	1,242
40-44	9	9	5	4	7	68	136	248	330	31	0	0	847
45-49	1	3	1	2	0	23	69	150	254	182	48	0	733
50-54	3	0	1	0	0	9	31	91	203	213	197	14	762
55-59	3	0	0	0	0	2	5	40	89	117	142	113	511
60-64	0	0	0	0	1	1	1	3	6	10	12	13	47
65 & Over	0	0	0	0	1	0	0	0	1	0	2	0	4
Total	1,248	1,089	880	706	755	2,628	1,563	1,167	969	553	401	140	12,099

**Distribution of Annuitants by Age
as of July 1, 2020**

<u>Age</u> (1)	<u>Number of Annuitants</u> (2)	<u>Total Annual Benefits</u> (3)	<u>Average Annual Benefits</u> (4)
Under 50	0	0	N/A
50 - 54	0	0	N/A
55 - 59	0	0	N/A
60 - 64	\$ 1,002	\$ 891	\$ 889
65 - 69	1,069	954	892
70 - 74	1,544	1,391	901
75 - 79	719	652	907
80 & Over	647	627	969
Total	\$ 4,981	\$ 4,515	\$ 906

Dollar amounts, except averages, are expressed in thousands.

Schedule of Retirants Added to And Removed from Rolls

(Dollar amounts except average allowance expressed in thousands)

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 (3)	Number (4)	Annual Benefits (5)	Number (6)	Annual Benefits (7)		
2006	303	276	90	91	2,903	2,757	7.2%	950
2007	362	329	61	58	3,204	3,028	9.8%	945
2008	364	331	76	75	3,492	3,284	8.5%	940
2009	378	335	85	83	3,785	3,536	7.7%	934
2010	267	237	101	99	3,951	3,674	3.9%	930
2011	399	351	98	93	4,252	3,932	7.0%	925
2012	259	228	92	87	4,419	4,073	3.6%	922
2013	244	211	122	116	4,541	4,168	2.3%	918
2014	195	165	108	103	4,628	4,230	1.5%	914
2015	155	142	136	122	4,647	4,250	0.5%	915
2016	195	172	133	125	4,709	4,297	1.1%	912
2017	222	197	142	137	4,789	4,357	1.4%	910
2018	192	174	160	150	4,821	4,381	0.6%	909
2019	241	213	139	129	4,923	4,465	1.9%	907
2020	211	191	153	141	4,981	4,515	1.1%	906



SECTION E

ASSESSMENT AND DISCLOSURE OF RISK

Risks Associated with Measuring the Accrued Liability And Actuarially Determined Contribution

(As Required by ASOP No. 51)

The determination of SCNG accrued liability and actuarially determined contribution requirement requires the use of assumptions regarding future economic and demographic experience. The risk measures illustrated in this section are intended to aid stakeholders in understanding the effects when future experience differs from the assumptions used in performing an actuarial valuation. These risk measures may also help with illustrating the potential volatility in the funded status and actuarially determined contributions that result from differences between actual experience and the expected experience based on the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience (economic and demographic) differing from the assumptions, changes in assumptions due to changing conditions, changes in contribution requirements due to modifications to the funding policy, and changes in the liability and cost due to changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risks that may reasonably be anticipated to significantly affect the System's future financial condition include:

- Investment risk – actual investment returns may differ from expected returns;
- Longevity risk – members may live longer or shorter than expected and receive pensions for a time period different than assumed;
- Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liabilities and contributions differing from expected;
- Asset/Liability mismatch – changes in assets may be inconsistent with changes in liabilities, thereby altering the relative difference between the assets and liabilities, which may alter the funded status and contribution requirements;
- Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions are not made in accordance with the System's funding policy or Statute, other anticipated payments to the plan are not made, or material changes occur in the anticipated number of covered employees, covered payroll, or another relevant contribution base.

On the other hand, effects of certain experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate of return, the funded status of the plan can be expected to decrease (or increase) more than anticipated.

Under South Carolina State Code, the Board must certify the employer contribution requirement annually. This amount is determined actuarially, based on the Board's funding policy.

Employer Risk with Contribution Requirements

The funding policy is intended to finance the unfunded actuarial accrued liability over a reasonable time period and provide stability in the employer contribution rates so employers are better able to budget their pension cost in future years. The greater the difference between the calculated funding period based on the contribution rate specified in State Code and the maximum specified funding period, the greater the ability for the System to incur some adverse experience without requiring an increase in the employer contribution rate.

However, providing stability in the contribution requirements means that projecting the year the fund actually attains a 100% funded ratio becomes less certain. If actual experience is more favorable than assumed, then the year the fund attains a 100% funded ratio will be earlier than projected, but the projected year the fund attains a 100% funded ratio will be later than projected if actual experience is less favorable than assumed.

Plan Maturity Measures

Risks faced by a pension plan evolve over time. A relatively new plan with virtually no assets and paying few benefits will experience lower investment risk than a mature plan with a significant amount of assets and large number of members receiving benefits. There are a few measures that can assist stakeholders in understanding and comparing the maturity of a plan to other systems, which include:

- Ratio of active to retired members: A relatively mature open plan is likely to have close to the same number of actives to retirees resulting in a ratio that is around 1.0. On the other hand, a super-mature plan, or a plan that is closed to new entrants will have more retirees than active members resulting in a ratio below 1.0. As this ratio declines, a larger portion of the total actuarial accrued liability in the System is attributable to retirees. This metric also typically moves in tandem with the liability to payroll metric, which provides an indication of potential contribution volatility.
- Ratio of net cash flow to market value of assets: A negative net cash flow means that benefit payments exceed contributions and the plan is depending on investment earnings and possibly existing funds to make payments to retirees. A certain amount of negative net cash flow is expected to occur when benefits are prefunded and the plan has matured. However, a relatively large negative net cash flow as a percent of assets may be an indication of the need for additional contributions for a plan with a low funded ratio.

The following exhibit provides a summary of these measures for SCNG. We have also included these metrics for the prior four years so stakeholders can identify how these measures are trending.

	2020	2019	July 1, 2018	2017	2016
Ratio of actives to retirees and beneficiaries	2.43	2.43	2.46	2.46	2.60
Ratio of net cash flow to market value of assets	2.5%	2.5%	1.3%	0.6%	1.2%

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Assumptions and Methods

The following presents a summary of the actuarial assumptions and methods used in the valuation of the South Carolina National Guard Supplemental Retirement Plan.

Investment Rate of Return

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

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

Rates of Annual Salary Increase

No increases in salary are assumed. The benefit is not related to pay.

Active Member Decrement Rates

- a. Assumed rates of service retirement are shown in the following table. Members who retire prior to age 60 are assumed to defer retirement benefits until age 60.

Age and Service Based Retirement Rates			
Age	Years of Service		
	20 - 24	25 - 29	30+
Age < 60	2.5%	5.0%	100.0%
Age > 59	100.0%	100.0%	100.0%

Members who reach age 60 with less than 20 years of service are assumed to retire at age 60 without a benefit from the plan.

- 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	0.1740%	0.1740%	0.0460%	0.0164%
30	0.2320%	0.2320%	0.0429%	0.0207%
35	0.4350%	0.4350%	0.0497%	0.0272%
40	0.5800%	0.5800%	0.0597%	0.0376%
45	0.8700%	0.8700%	0.0924%	0.0624%
50	1.0875%	1.0875%	0.1602%	0.1047%
55	0.0000%	0.0000%	0.2649%	0.1589%
60	0.0000%	0.0000%	0.4454%	0.2320%
Multiplier	145.0%	145.0%	95.0%	95.0%

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

Post Retirement Mortality

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 projected using Scale AA projection table from the year 2016 and multipliers based on plan experience. The following are sample rates:

Annuitant Mortality Rates Before Projection		
Age	Males	Females
50	0.2548%	0.1454%
55	0.4006%	0.2465%
60	0.7329%	0.4265%
65	1.2748%	0.5924%
70	1.9648%	0.9640%
75	3.3994%	1.8534%
80	6.3116%	3.7276%
85	11.4493%	7.0538%
90	19.8803%	12.3489%
Multiplier	125%	111%

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	18.9	19.3	19.7	20.0
Female	22.7	22.8	23.0	23.2

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 includes \$15,000 for plan incurred administrative expenses.
2. There is not a marriage assumption.
3. Decrement timing: Decrements of all types are assumed to occur mid-year.
4. 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.

Participant Data

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

The data for active members included birth date, gender, total military service and total South Carolina National Guard service. 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.

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 National Guard Supplemental Retirement Plan (SCNG)

Effective Date: July 1, 1975

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

Eligibility: All members of the South Carolina National Guard who became members on or before June 30, 1993 are covered by the System. Effective January 1, 2007, eligibility for membership has been extended to those guardsmen who became members of the South Carolina National Guard after June 30, 1993.

Employee Contributions: Contributions from members are not permitted.

Service Retirement:

- a. **Eligibility:** Members who are honorably discharged after attaining age 60 with at least 20 years of creditable military service, which include at least 15 years, 10 of which immediately preceding retirement, with the National Guard of South Carolina.
- b. **Monthly Benefit:** \$50 per month for 20 years of creditable service with an additional \$5 per month for each additional year of service, subject to a maximum monthly benefit of \$100 per month.
- c. **Payment Form:** Life annuity.

Disability Retirement: None

Deferred Termination Benefit:

- a. **Eligibility:** Members who are honorably discharged prior to attaining age 60 with at least 20 years of creditable military service, which include at least 15 years, 10 of which immediately preceding retirement, with the National Guard of South Carolina.
- b. **Monthly Benefit:** Upon attaining age 60, the member will receive \$50 per month for 20 years of creditable service with an additional \$5 per month for each additional year of service, subject to a maximum monthly benefit of \$100 per month.
- c. **Payment Form:** Life annuity.

Active Member Death Benefit: None.

Postretirement Benefit Increases: None.



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 may not decrease by exactly one year in the subsequent year's actuarial valuation. In some instances, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In other instances, the amortization period may "float" from year to year, meaning it could increase, decrease, or remain relatively unchanged from the amortization period in the prior year's valuation.

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.

DRAFT

PUBLIC EMPLOYEE BENEFIT AUTHORITY AGENDA ITEM
Retirement Policy Committee

Meeting Date: December 2, 2020

1. Subject: Defined Contribution Quarterly Report

2. Summary: Mr. Mike Wright and Mr. Joe Ferguson from Segal Marco Advisors will present the Defined Contribution Quarterly Report for the quarter ending September 30, 2020.

3. What is Committee asked to do? Receive as information

4. Supporting Documents:

(a) Attached: 3rd Quarter 2020 Investment Review

South Carolina Defined Contribution Plans

EXECUTIVE SUMMARY

Third Quarter 2020 Investment Review

December 2020

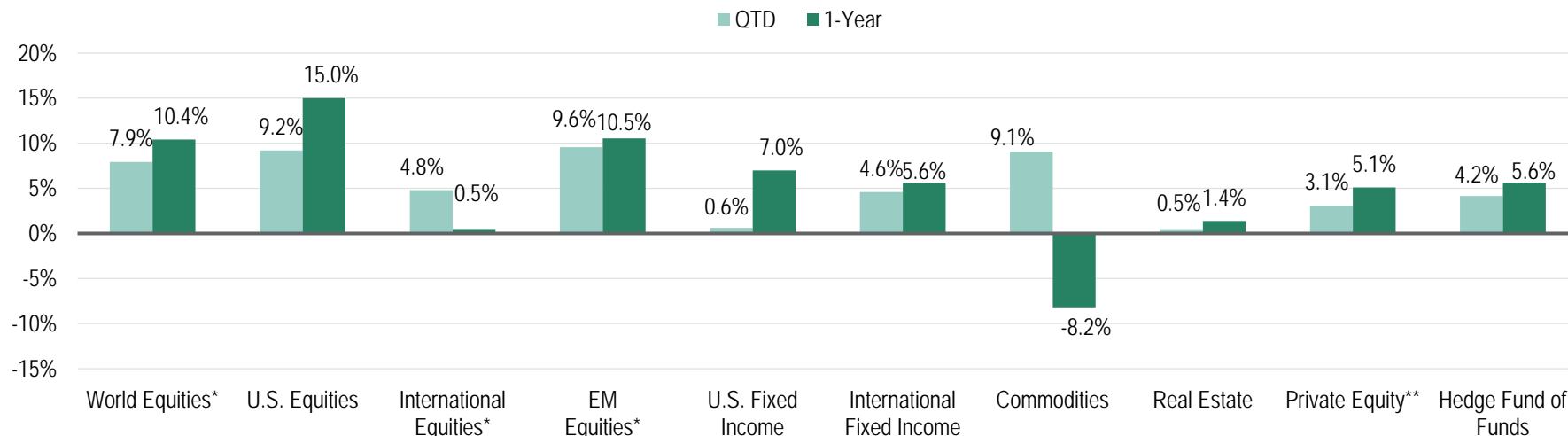
Michael C. Wright
Senior Vice President

Joe Ferguson
Consultant

Financial Market Conditions

Q3 2020 In Review

Summary of Investment Returns



Quarterly Synopsis

- World equity markets rose in Q3. Economies continued to reopen gradually as COVID cases were lower over the summer.
- U.S. equity was solidly positive. The promise of more fiscal stimulus buoyed investors for much of the quarter (though it did not arrive).
- International equities were also higher. The economies of the Eurozone and Japan rebounded somewhat from COVID-related downturns.
- Emerging market equity increased as China in particular continued its post-outbreak economic recovery.
- U.S. fixed income eked out a gain. The Federal Reserve said it would keep rates low for the foreseeable future.
- Non-U.S. fixed income rose. A weak USD helped boost unhedged non-US debt.
- Hedge funds increased. Emerging market strategies performed best in the quarter.
- Commodities posted a strong gain amid hopes that global demand would pick up as COVID cases apparently retreated.

* Net Dividends Reinvested

** Performance as of Q1 2020 because more recent performance data is not yet available.

Sources: Investment Metrics, Thomson One, FactSet

Annual Asset Class Performance

As of September 30, 2020

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	YTD
Best	35.93	39.78	5.24	79.02	29.09	13.56	18.64	43.30	30.38	5.67	31.74	37.75	1.86	36.39	24.33
	32.59	11.81	1.80	58.21	28.47	8.68	18.53	38.82	13.45	2.52	21.31	30.21	0.01	31.43	9.22
	26.86	11.63	-2.35	37.21	26.85	8.46	18.05	34.52	13.24	1.23	17.34	25.62	-0.23	28.48	6.79
	23.48	11.63	-10.91	34.47	24.50	7.84	17.90	33.48	13.05	0.92	17.13	22.17	-1.26	26.54	6.40
	22.25	7.05	-20.30	32.46	19.20	4.98	17.78	33.11	5.97	0.65	12.05	21.69	-1.51	25.84	3.88
	18.37	6.97	-26.16	28.61	16.71	2.64	17.51	32.53	5.60	0.55	11.60	14.65	-2.08	25.53	2.45
	15.46	6.28	-28.92	28.43	16.10	1.50	16.42	23.29	5.53	0.03	11.32	13.66	-4.57	22.66	0.62
	13.35	5.77	-33.79	28.19	15.51	0.39	16.35	7.90	4.89	-0.39	10.19	9.32	-4.61	22.39	0.56
	11.86	4.74	-36.85	27.17	15.12	0.06	15.81	7.44	4.22	-1.38	8.60	7.84	-4.78	18.90	0.37
	9.86	1.87	-37.60	24.67	13.16	-2.44	15.26	2.47	3.64	-1.44	7.08	7.50	-8.27	14.42	-0.91
	9.07	1.81	-37.98	20.58	12.06	-2.91	14.59	0.06	3.40	-3.83	6.36	5.07	-9.31	14.32	-6.73
	8.99	-0.17	-38.44	19.69	8.21	-4.18	8.18	-2.02	2.45	-4.41	4.68	4.09	-11.01	8.72	-8.69
	4.76	-1.57	-38.54	11.41	6.54	-5.50	6.98	-2.27	0.02	-4.47	2.65	3.54	-12.86	8.43	-11.58
	4.34	-9.78	-43.06	5.93	6.31	-11.73	4.21	-6.58	-1.82	-7.47	1.51	3.01	-13.36	5.29	-17.12
Worst	0.49	-16.81	-53.18	0.16	0.10	-18.17	0.09	-8.61	-4.48	-14.60	0.27	0.84	-14.25	2.25	-21.54

Russell 1000 Index	Russell 1000 Value Index	Russell 1000 Growth Index	Russell 2000 Index	Russell 2000 Value Index	Russell 2000 Growth Index	MSCI EAFE Index	MSCI Emerging Markets Index	MSCI U.S. REIT Index	Barclays Agg.	Blmbg. Barc. U.S. TIPS	Blmbg. Barc. U.S. Corp. High Yield	JPM EMBI Global (USD)	HFRI RV: Multi-Strategy Index	FTSE 3 Month T-Bill
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Defined Contribution Update

Defined Contribution Update: Legislation

Fluidity of Negotiations in the Next Coronavirus Relief Bill

Not Clear What, if Any, DC-Related Provisions Will be Included

- HEROES Act – passed the House on May 15, 2020, revised version passed on October 1, 2020 – essentially a Democratic proposal
 - Extends required minimum distribution relief to 2019 RMDs
 - Clarifies that individuals can self-certify eligibility for Coronavirus-related loans (if loan eligibility is expanded into later years) and distributions
 - Allows money purchase plans to make Coronavirus-related distributions even if distributions would not otherwise be permitted (i.e., the participant is in-service)
- HEALS Act – Senate Republican proposal released 7-27-20 – same money purchase plan provision as in the HEROES Act, confirms plan sponsors can rely on self-certification for Coronavirus-related loans
- Other possibilities for DC plan-related provisions:
 - Extension of RMD relief to 2021 RMDs
 - Employee catch-up contributions in 2021 and 2022 to make up for missed 2020 deferrals
 - General nondiscrimination testing relief, including safe harbor 401(k) plans that stop contributions for the remainder of 2020
 - Making Coronavirus-related distributions available to all participants – i.e., no need to meet the current “qualified individual” criteria from the CARES Act

Defined Contribution Update: Legislation

Bipartisan Securing a Strong Retirement Act of 2020 (SSRA)

Recently Proposed Version of SECURE 2.0 Includes a Grab-Bag of Proposals

- Performance benchmarks for asset allocation funds
 - Investments with a mix of asset classes, e.g., target date funds, could be benchmarked against an appropriate blend of broad-based security market indices
 - Allowance for matching contributions for student loan payments
 - Changes to required minimum distribution rules, including age 75 required beginning date
 - Required auto-enrollment for new 401(k) and 403(b) plans
 - Changes to long-term, part-time worker participation rule to include more workers
 - Higher catch-up contribution limits
 - Sanctioning of small financial incentives to employees who contribute to a 401(k) or 403(b) plan
 - Elimination of certain notices for unenrolled participants
 - Safe-harbor for corrections of employee deferral election failures
 - Changes to IRS correction rules
 - Creation of retirement savings “lost and found” register
-

Defined Contribution Update: IRS Guidance

Notice 2020-68 Weighs in on the SECURE Act

Addresses qualified birth and adoption distributions, part-time employee participation

- Distribution, re-contribution rules for qualified birth and adoption distributions (QBADs)
 - Distribution not subject to 10% penalty for early withdrawals if made within one year of birth or adoption of a child
 - Plans are not required to permit this distribution – but individuals can claim penalty relief on their tax return
 - An individual can take a QBAD with respect to the birth or adoption of more than one child within a year (e.g., twins) and the distribution may be made from elective contributions, qualified non-elective contributions, qualified matching contributions, and safe harbor contributions
 - A QBAD is not considered a rollover distribution – but plans can opt to permit re-contributions of QBADs and treat them as direct rollovers from another eligible retirement plan

Defined Contribution Update: Litigation

One Plan Sponsor Evades Cyber Fraud Liability

Court dismissed Abbott Labs from a lawsuit addressing retirement account theft

- Complaint filed in April 2020 alleges breach of fiduciary duty by both the plan sponsor and the recordkeeper
 - According to the complaint, the cyber thief had some personal information about the plaintiff and accessed the account through the “forgot password” option –successfully orchestrating a fraudulent transfer of \$240,000
- Court ruled that the plaintiff failed to sufficiently allege that Abbott Labs was a fiduciary or to link any purportedly fiduciary acts to the theft – and therefore released Abbott Labs from the litigation
 - Both the plan call center and website are operated by the recordkeeper, Alight
 - Plan administrator and named fiduciary did not operate the plan website
- However, the court allowed the litigation to proceed against Alight because of sufficient allegations to infer that Alight exercised discretionary control over the plan’s assets and made misleading representations online about the quality of its services

Defined Contribution Update: Litigation

Recent Defined Contribution Lawsuit Developments

Claims against Salesforce dismissed, new lawsuit against Nestle, Cornell settled

- **Salesforce fended off excessive fee allegations**
 - Plaintiffs claimed Salesforce failed to use its substantial bargaining power to negotiate lower fees for plan investment products and recordkeeping services, and that plans should generally not invest in actively managed funds because of their higher fees as compared with passive fund fees
 - Court ruled that simply alleging passively managed funds as available alternatives to actively managed funds “does not suffice to demonstrate imprudence” and found the allegations about the plan not receiving any services or benefits based on its use of the more expensive share class to be conclusory
- **Lawsuit recently filed against Nestle over plan’s managed accounts, recordkeeping**
 - Allegations that the plan failed to regularly solicit quotes or bids from providers, including its own recordkeeper – resulting in unreasonably high fees
 - Plaintiffs claim the plan’s managed account services, provided by Voya, added no material value
 - Further allegation that Nestle impermissibly paid itself for providing worthless administrative services to the plan – in violation of ERISA’s duty of loyalty
- **Parties in Cornell 403(b) fee suit announce settlement (amount not yet disclosed)**
 - Similar to other lawsuits challenging university 403(b) plans – excessive fees, imprudent investments, too many investment options, and waste in using more than one recordkeeper

Deferred Compensation Program

Deferred Compensation Program Summary

➤ Commentary

- Investments in the third quarter continued the trend for positive returns from the previous three months despite the impact of COVID-19; Equity markets had single digit gains. Lower risk options including bonds were in positive territory even in a period where rates failed to fall.

GW Stable Value

- In general, stable value funds will have a challenging time keeping a book to market value at or above 100% in a rising rate environment. While rates are currently at historic lows, there is no market consensus expectation for near term increases. Having that ratio above 100% allows the portfolio to provide investors with stable positive returns with no long term adverse impact on future crediting rates or liquidity. The book to market value for the Plan's stable value fund was 104.1% at the end of the quarter. The current credit rate is 2.35%.
- Segal Marco notes this fund is not on informal review and continues to meet standards regarding returns, risk, fees, assets, management and style consistency.

Deferred Compensation Program Summary

➤ Commentary Continued

T. Rowe Price Growth Stock

- For the three and five year periods, the strategy placed below its index, Russell 1000 Growth, and in the bottom half of its peer group universe.
 - Three Year Performance: The fund returned 18.85% versus 21.67% for its benchmark. Over the same period it placed in the bottom half (67th percentile) of the peer group universe
 - Five Year Performance: The fund returned 18.43% versus 20.10% for its benchmark. Over the same period it placed below the median (51st percentile) compared to peer group universe
- Segal Marco notes this fund continues to meet standards regarding risk, fees, assets, management and style consistency.
- Segal Marco will continue to monitor this investment option on an informal basis.

Deferred Compensation Program Summary

➤ Commentary Continued

Hartford Mid Cap

- For the three and five year periods, the strategy placed below its index, Russell Mid Cap Growth, and in the bottom half of its peer group universe.
 - Three Year Performance: The fund returned 9.40% versus 16.23% for its benchmark. Over the same period it placed in the bottom quartile (90th percentile) of the peer group universe
 - Five Year Performance: The fund returned 11.70% versus 15.53% for its benchmark. Over the same period it placed below the median (87th percentile) compared to peer group universe
- Segal Marco notes this fund continues to meet standards regarding risk, fees, assets, management and style consistency.
- Segal Marco will continue to monitor this investment option on an informal basis.

South Carolina Deferred Compensation Program

Asset Allocation by Plan

September 30, 2020

Name		401(k) Market Value	% of Plan Assets	457 Market Value	% of Plan Assets	Total Market Value	Total % of Plan Assets
Domestic Equity Large Cap Funds		\$ 1,117,453,931	30%	\$ 265,758,938	25%	\$ 1,383,212,869	29%
Vanguard Institutional Index	VIIIX	\$ 592,250,541	16%	\$ 143,543,668	13%	\$ 735,794,209	15%
Dodge & Cox Stock	DODGX	\$ 231,116,127	6%	\$ 62,510,592	6%	\$ 293,626,719	6%
T. Rowe Price Growth Stock	PRGFX	\$ 294,087,263	8%	\$ 59,704,678	6%	\$ 353,791,941	7%
Domestic Equity Mid / Small Cap Funds		\$ 388,160,023	10%	\$ 103,667,676	10%	\$ 491,827,699	10%
T. Rowe Price Mid Cap Value	TRMIX	\$ 143,672,451	4%	\$ 40,441,987	4%	\$ 184,114,438	4%
Hartford Mid Cap	HFMVX	\$ 119,551,673	3%	\$ 26,242,339	2%	\$ 145,794,012	3%
TIAA CREF Small Cap Blend Index	TISBX	\$ 23,330,615	1%	\$ 8,576,657	1%	\$ 31,907,272	1%
American Beacon Small Cap Value	AVFIX	\$ 23,737,077	1%	\$ 7,192,545	1%	\$ 30,929,622	1%
AllianceBernstein Small Cap Growth	QUAIX	\$ 77,868,207	2%	\$ 21,214,148	2%	\$ 99,082,355	2%
Global/International Equity Funds		\$ 298,091,461	8%	\$ 77,713,211	7%	\$ 375,804,672	8%
American Funds New Perspective	RNPGX	\$ 54,643,153	1%	\$ 15,461,486	1%	\$ 70,104,639	1%
Fidelity Diversified International		\$ 120,204,700	3%	\$ 28,584,754	3%	\$ 148,789,454	3%
American Funds EuroPacific Growth	RERGX	\$ 123,243,608	3%	\$ 33,666,971	3%	\$ 156,910,579	3%
Hybrid Funds		\$ 552,299,866	15%	\$ 221,102,744	21%	\$ 773,402,610	16%
SSgA Target Retirement 2065 W		\$ 297,770	0%	\$ 164,151	0%	\$ 461,921	0%
SSgA Target Retirement 2060 W		\$ 2,243,528	0%	\$ 673,585	0%	\$ 2,917,113	0%
SSgA Target Retirement 2055 W		\$ 1,838,199	0%	\$ 572,746	0%	\$ 2,410,945	0%
SSgA Target Retirement 2050 W		\$ 9,881,203	0%	\$ 4,377,683	0%	\$ 14,258,886	0%
SSgA Target Retirement 2045 W		\$ 5,698,475	0%	\$ 2,130,272	0%	\$ 7,828,747	0%
SSgA Target Retirement 2040 W		\$ 51,584,229	1%	\$ 14,987,373	1%	\$ 66,571,602	1%
SSgA Target Retirement 2035 W		\$ 9,708,740	0%	\$ 2,984,551	0%	\$ 12,693,291	0%
SSgA Target Retirement 2030 W		\$ 91,315,855	2%	\$ 27,431,223	3%	\$ 118,747,078	2%
SSgA Target Retirement 2025 W		\$ 23,928,602	1%	\$ 7,248,910	1%	\$ 31,177,512	1%
SSgA Target Retirement 2020 W		\$ 98,596,464	3%	\$ 30,350,624	3%	\$ 128,947,088	3%
SSgA Target Retirement Income W		\$ 257,206,801	7%	\$ 130,181,626	12%	\$ 387,388,427	8%
Fixed Income Funds		\$ 252,570,738	7%	\$ 65,390,745	6%	\$ 317,961,483	7%
Baird Aggregate Bond	BAGIX	\$ 175,080,299	5%	\$ 46,607,030	4%	\$ 221,687,329	5%
Fidelity Inflation Protected Bond	FIPDX	\$ 77,490,439	2%	\$ 18,783,715	2%	\$ 96,274,154	2%
Stable Value/Guaranteed Certificates		\$ 1,099,188,245	29%	\$ 330,778,921	31%	\$ 1,429,967,166	30%
GW Stable Value		\$ 1,050,889,727	28%	\$ 308,602,310	29%	\$ 1,359,492,037	28%
84 Month Deposit		\$ 48,298,518	1%	\$ 22,176,611	2%	\$ 70,475,129	1%
Miscellaneous		\$ 18,867,592	1%	\$ 7,748,767	1%	\$ 26,616,359	1%
Self Directed Brokerage		\$ 18,019,363	0%	\$ 7,596,865	1%	\$ 25,616,228	1%
Self Directed Brokerage (ROTH)		\$ 848,229	0%	\$ 151,902	0%	\$ 1,000,131	0%
Total Plan \$		\$ 3,726,631,856	100%	\$ 1,072,161,002	100%	\$ 4,798,792,858	
% of Total Assets			78%		22%		

Percentages may not add to 100% due to rounding

South Carolina Deferred Compensation Program

Fund Monitor

September 30, 2020

Fund	Performance		Performance		Risk	Comment/Status
	3 Year vs Index	3 Year vs Peers	5 Year vs Index	5 Year vs Peers	Standard Deviation	
Vanguard Institutional Index	Pass	N/A	Pass	N/A	Pass	
Dodge & Cox Stock	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Growth Stock	Fail	Fail	Fail	Fail	Pass	Informal Review
T. Rowe Price Mid Cap Value	Pass	Pass	Pass	Pass	Pass	
Hartford Mid Cap	Fail	Fail	Fail	Fail	Pass	Informal Review
TIAA CREF Small Cap Blend Index	Pass	N/A	Pass	N/A	Pass	
American Beacon Small Cap Value	Fail	Pass	Fail	Pass	Pass	
AllianceBernstein Small Cap Growth	Pass	Pass	Pass	Pass	Pass	
American Funds New Perspective	Pass	Pass	Pass	Pass	Pass	
Fidelity Diversified International	Pass	Pass	Pass	Pass	Pass	
American Funds EuroPacific Growth	Pass	Pass	Pass	Pass	Pass	
SSgA Target Retirement 2065 W Index	N/A	N/A	N/A	N/A	Pass	
SSgA Target Retirement 2060 W Index	Pass	N/A	N/A	N/A	N/A	
SSgA Target Retirement 2055 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement 2050 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement 2045 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement 2040 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement 2035 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement 2030 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement 2025 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement 2020 W Index	Pass	N/A	Pass	N/A	Pass	
SSgA Target Retirement Income W Index	Pass	N/A	Pass	N/A	Pass	
Baird Aggregate Bond	Pass	Pass	Pass	Pass	Pass	
Fidelity Inflation Protected Bond Index	Pass	N/A	Pass	N/A	Pass	
GW Stable Value	Pass	N/A	Pass	N/A	N/A	
84 Month Deposit	N/A	N/A	N/A	N/A	N/A	
Self Directed Brokerage	N/A	N/A	N/A	N/A	N/A	
Self Directed Brokerage (ROTH)	N/A	N/A	N/A	N/A	N/A	

Index funds must return within 30 basis points of their respective benchmarks

Actively managed funds must outperform respective benchmarks

Actively managed funds must rank in the top half of their respective peer universes

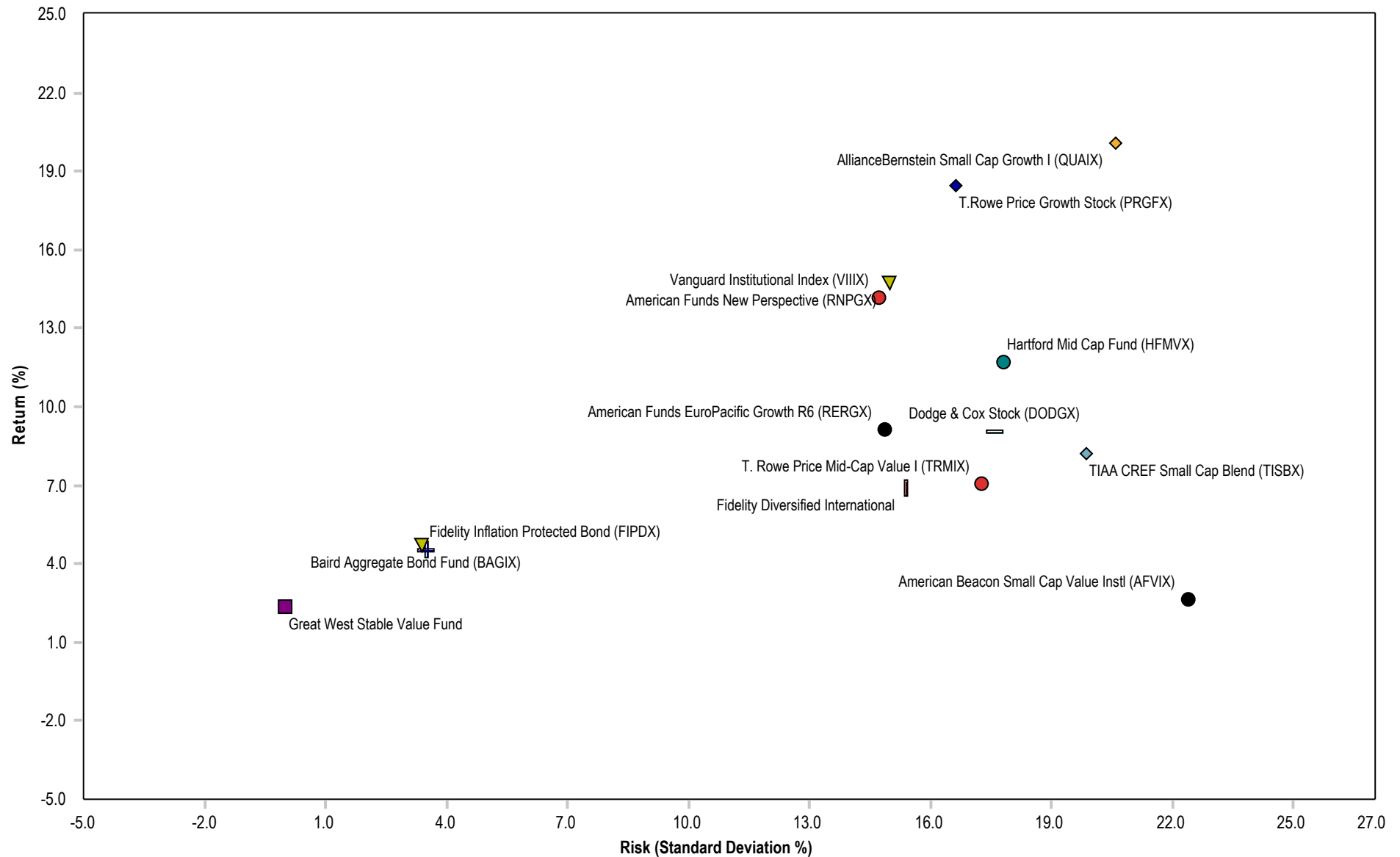
South Carolina Deferred Compensation Program

Fund Line-Up Statistics September 30, 2020

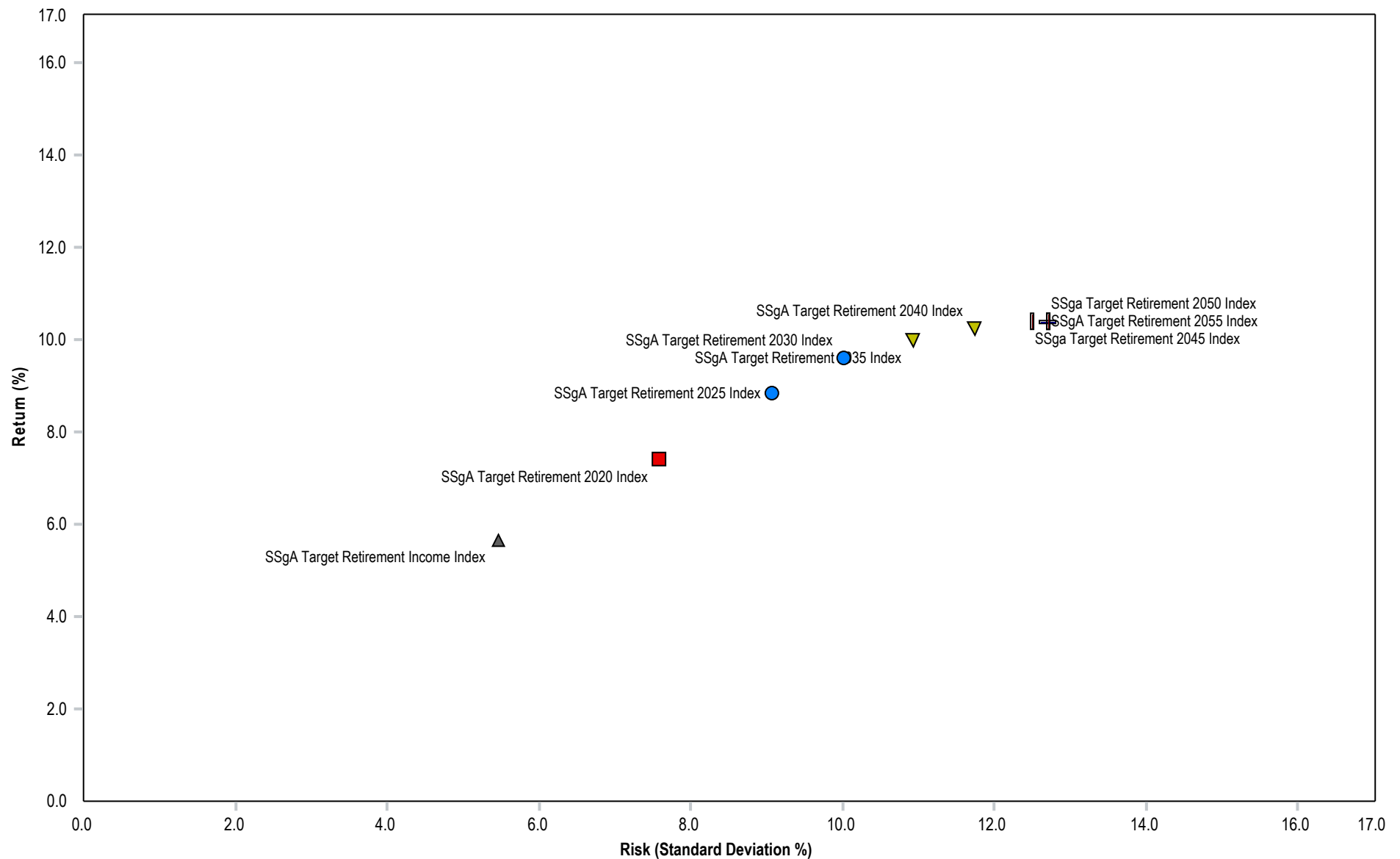
Fund	Ticker	Net Expense Ratio (%)	5-Year Standard Deviation (%)	Return (%) 1 Year	Return (%) 3 Years	Return (%) 5 Years
Domestic Equity						
Vanguard Institutional Index	VIIIX	0.02	14.61	15.15	12.27	14.14
Dodge & Cox Stock	DODGX	0.52	17.51	-2.39	2.84	9.06
T. Rowe Price Growth Stock	PRGFX	0.65	16.52	34.55	18.85	18.43
T. Rowe Price Mid-Cap Value	TRMIX	0.65	17.29	-1.45	0.99	7.03
Hartford MidCap R6	HFMVX	0.75	17.82	5.82	9.40	11.70
TIAA-CREF Small Cap Blend Index	TISBX	0.06	19.93	0.63	1.92	8.19
American Beacon Small Cap Value	AVFIX	0.83	22.53	-15.06	-5.82	2.63
AllianceBernstein Small Cap Growth	QUAIX	0.91	20.73	36.83	20.91	20.07
International Equity						
American Funds New Perspective	RNPGX	0.42	14.91	25.74	13.77	14.71
Fidelity Diversified International	N/A	0.58	15.41	7.87	3.82	6.86
American Funds EuroPacific Growth	RERGX	0.46	14.87	14.97	5.67	9.08
Hybrid Funds						
SSgA Target Retirement 2065 W	N/A	0.10	N/A	N/A	N/A	N/A
SSgA Target Retirement 2060 W	N/A	0.10	12.73	12.26	7.89	10.39
SSgA Target Retirement 2055 W	N/A	0.10	12.73	12.26	7.89	10.39
SSgA Target Retirement 2050 W	N/A	0.10	12.73	12.27	7.89	10.38
SSgA Target Retirement 2045 W	N/A	0.10	12.50	12.30	7.93	10.35
SSgA Target Retirement 2040 W	N/A	0.10	11.75	12.37	8.00	10.24
SSgA Target Retirement 2035 W	N/A	0.10	10.93	12.38	8.00	9.99
SSgA Target Retirement 2030 W	N/A	0.10	10.03	12.08	7.89	9.62
SSgA Target Retirement 2025 W	N/A	0.10	9.08	10.42	7.20	8.85
SSgA Target Retirement 2020 W	N/A	0.10	7.60	7.66	5.95	7.42
SSgA Target Retirement Income W	N/A	0.10	5.46	6.86	5.17	5.66
Fixed Income						
Baird Aggregate Bond Inst	BAGIX	0.30	3.43	7.80	5.62	4.69
Fidelity Inflation-Prot Bd Idx Instl	FIPDX	0.05	3.57	9.78	5.72	4.54
Stable Value/Guaranteed Certificates						
GW Stable Value Fund	N/A	0.16	0.03	2.43	2.36	2.32
84 Month Deposit Fund	N/A	N/A	N/A	N/A	N/A	N/A
Miscellaneous						
Self-Directed Brokerage	N/A	N/A	N/A	N/A	N/A	N/A
Self-Directed Brokerage (ROTH)	N/A	N/A	N/A	N/A	N/A	N/A

Expense Ratio and Standard Deviation: Lower is better

Return: Higher is better



Calculation based on monthly periodicity.



Calculation based on monthly periodicity.

State Optional Retirement Program

State ORP Summary

➤ MassMutual

➤ Scheduled Lineup Changes

- The Board approved the removal of a balanced fund and addition of an international equity index fund. These changes are scheduled to take place in the first half of January 2021.

➤ Current Lineup

- None of the investment options in the current MassMutual lineup are under informal review.

➤ MetLife

➤ Scheduled Changes

- Voya will replace MetLife as a record keeper in the State ORP during a transition to take place over the last half of December 2020 and first half of January 2021.

➤ Current Lineup

- Clearbridge Large Cap Growth, Victory Integrity Small Cap Value and Harding Loevner Emerging Markets all underperformed the respective indexes and peer group medians for the three and five year periods.
 - Normally these funds would be on informal review; however, the Board has taken action on the MetLife lineup as a whole in a previous meeting. There is neither a recommendation from Segal Marco nor an action needed from the Board.

State ORP Summary

➤ TIAA

➤ Scheduled Lineup Changes

- The Board approved the removal of the CREF Social Choice and TIAA-CREF Real Estate Securities funds and the addition of an international equity index fund. These changes will take place in early January 2021.

➤ Current Lineup

➤ CREF Inflation Linked Bond

- For the three and five year periods, the strategy placed below its index, Bloomberg Barclays US TIPS, and in the bottom half of its peer group universe.
 - Three Year Performance: The fund returned 4.32% versus 5.79% for its benchmark. Over the same period it placed in the bottom half (66th percentile) of the peer group universe
 - Five Year Performance: The fund returned 3.49% versus 4.61% for its benchmark. Over the same period it placed below the median (60th percentile) compared to peer group universe
- Segal Marco notes this fund continues to meet standards regarding risk, fees, assets, management and style consistency.
- Segal Marco will continue to monitor this investment option on an informal basis.

State ORP Summary

➤ AIG

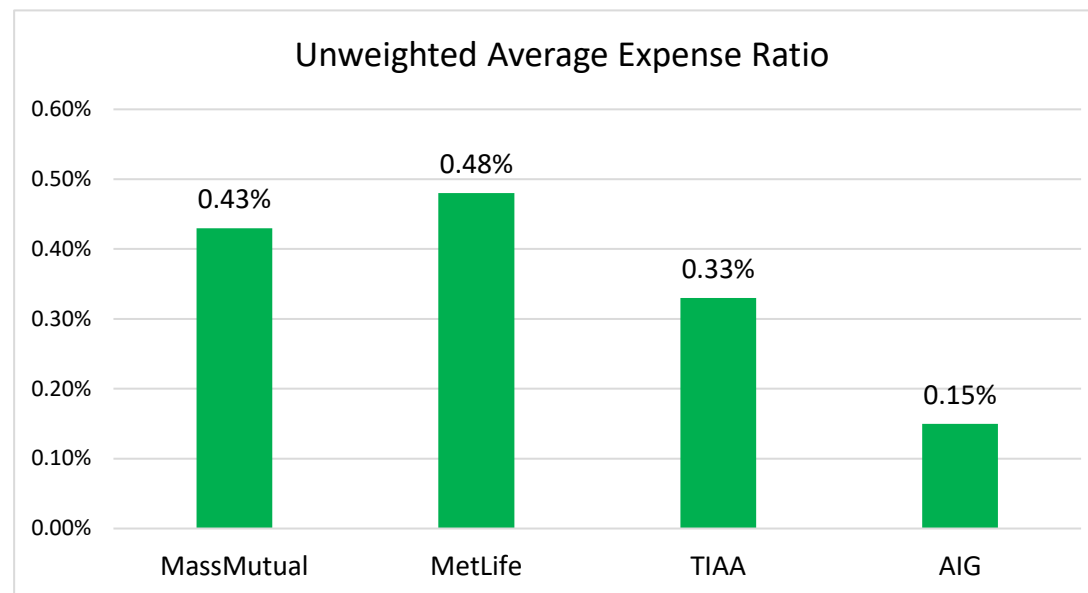
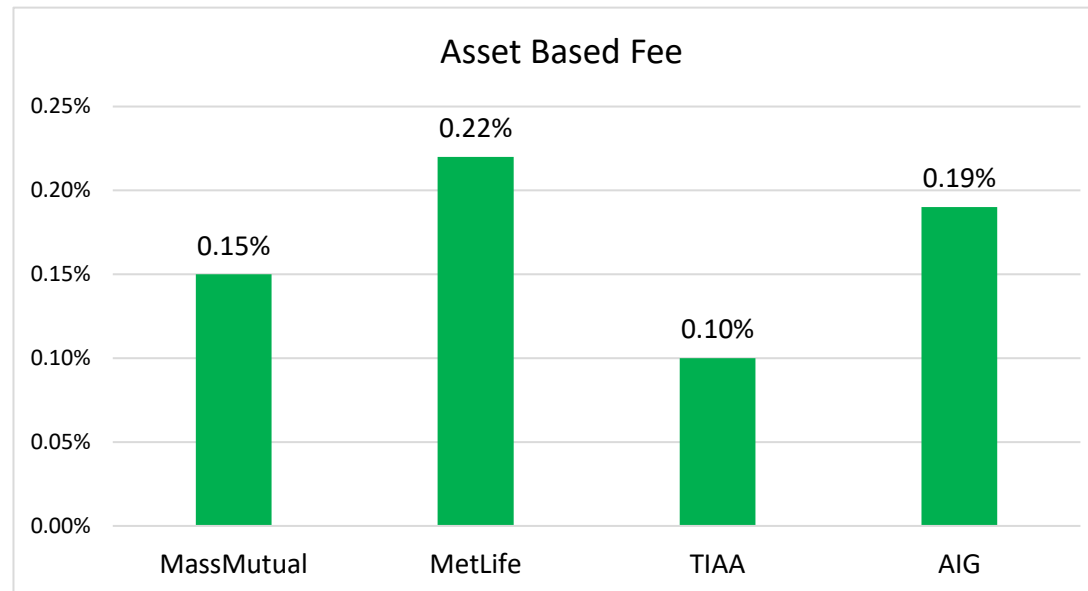
➤ Scheduled Lineup Changes

- The Board approved the removal of the Vanguard Healthcare Fund and the addition of an international equity index fund. The Vanguard Institutional Index, T. Rowe Price Large Cap Growth and Vanguard Target Date Funds were also approved to be replaced. These changes will take place in early January 2021.

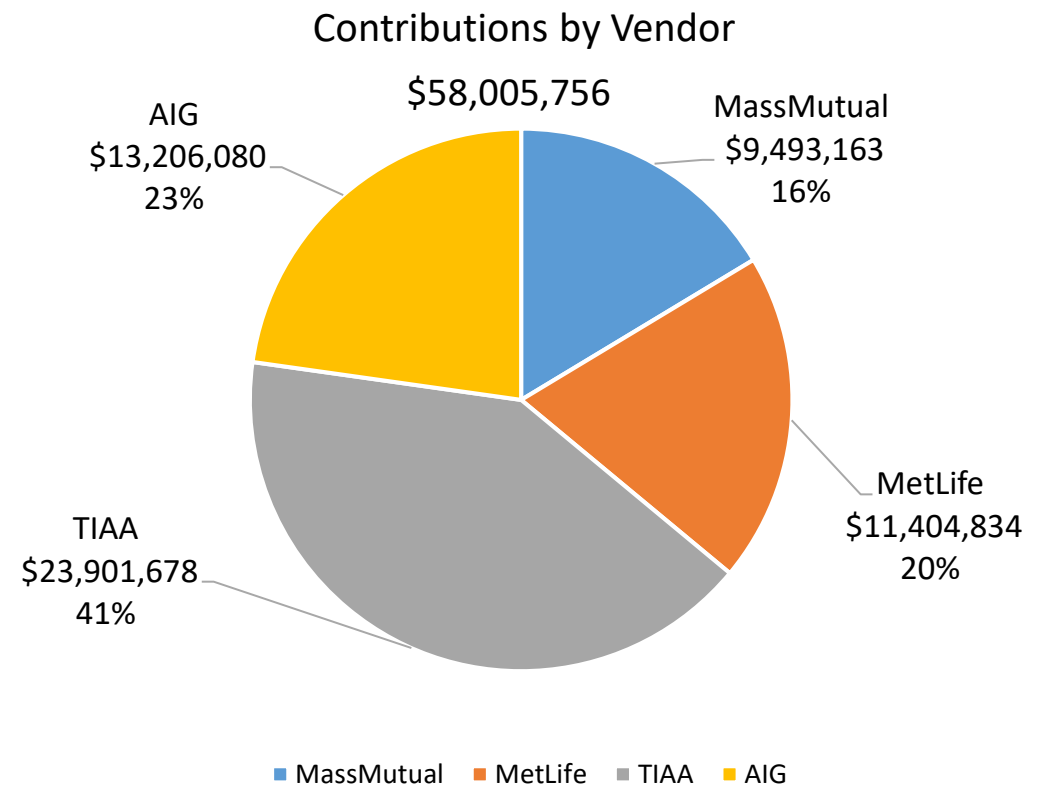
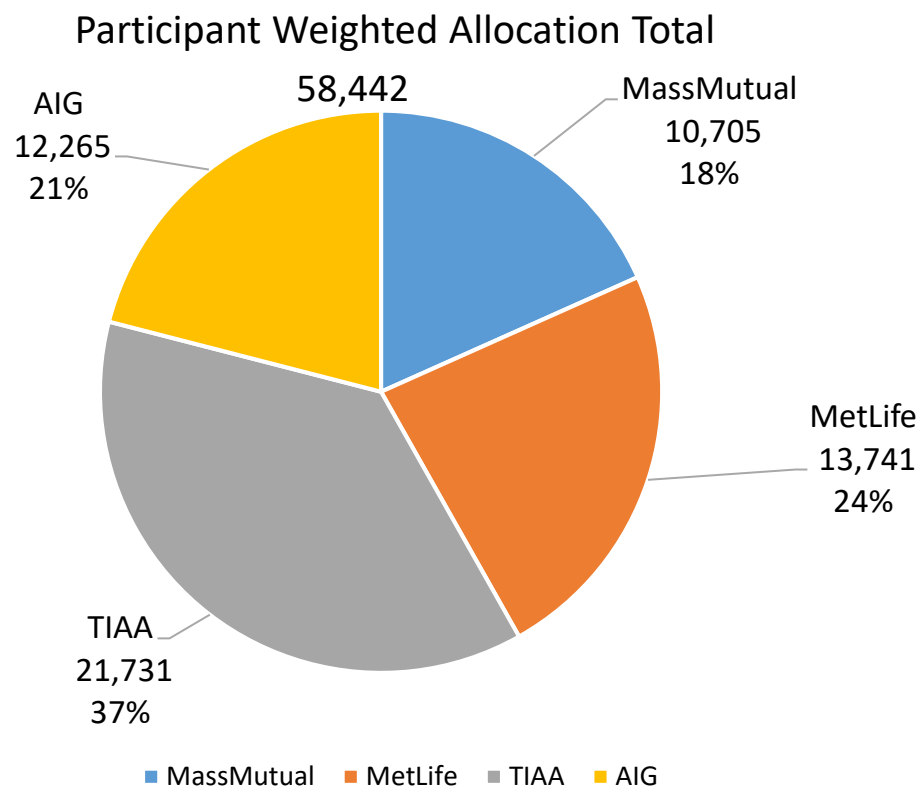
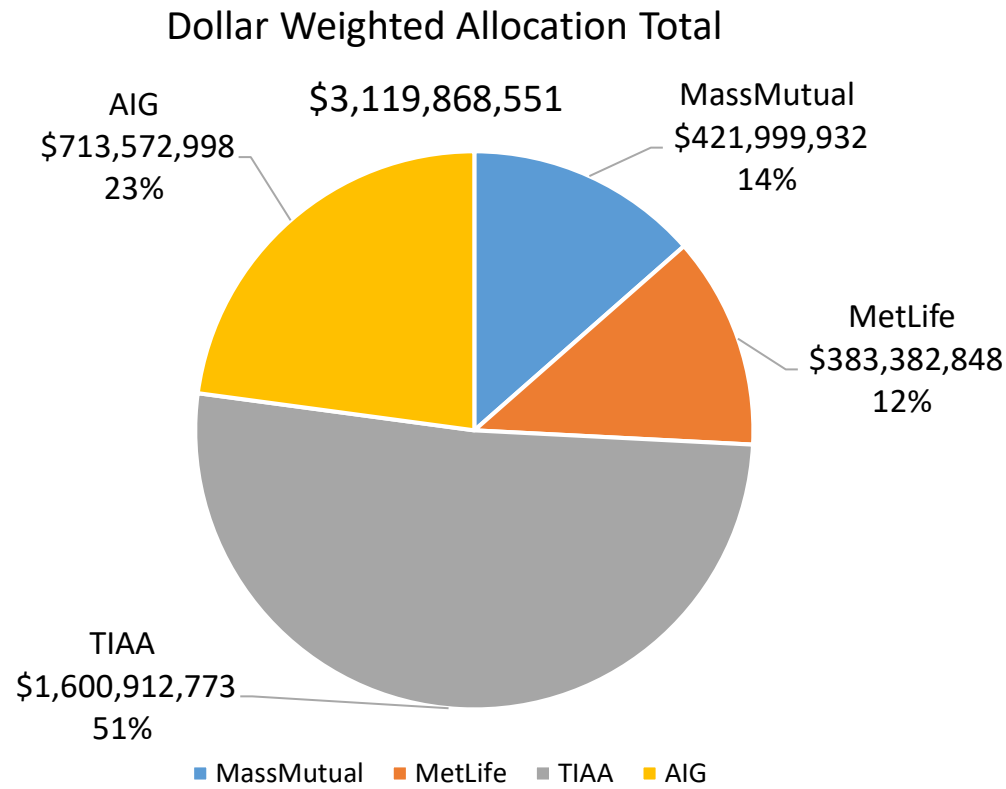
➤ Current Lineup

- None of the current funds that will remain in the AIG lineup after the January changes are on informal review.

State ORP Vendor Fee Comparison September 30, 2020



State ORP Total Plan Allocation September 30, 2020



State ORP Fund Line-Up Comparison September 30, 2020

Asset Class		MassMutual	MetLife	TIAA	AIG
Domestic Equity	Large Core	Vanguard Institutional Index (VINIX)	Vanguard Institutional Index (VINIX)	TIAA-CREF Equity Index I (TIEIX)	Vanguard Institutional Index (VINIX)
	Large Value	MFS Value R5 (MEIKX)	JP Morgan Equity Income R6 (OIEJX)	T. Rowe Price Inst Large Cap Value (TILCX)	Vanguard Value Index (VIVIX)
	Large Growth	MassMutual Select Blue Chip Growth I (MBCZX)	ClearBridge Large Cap Growth I (SBLIX)	-	T. Rowe Price Instl Large Cap Growth (TRLGX)
	Mid/SMID	Vanguard Mid Cap Index Inst (VMCIX)	Vanguard Mid Cap Index Inst (VMCIX)	Vanguard Mid Cap Index Inst (VMCIX)	Vanguard Mid Cap Index Inst (VMCIX)
	Small Core	Vanguard Small Cap Index Inst (VSCIX)	Delaware Small Cap Core (DCCIX)	TIAA-CREF Small Cap Index I (TISBX)	Vanguard Small Cap Index Inst (VSCIX)
	Small Value	American Beacon Small Cp Val Inst (AVFIX)	Victory Integrity Small-Cap Value R6 (MVSSX)	-	-
	Small Growth	INVESCO Small Cap Growth R6 (GTSFX)	T. Rowe Price QM US Small-Cap Growth (PRDSX)	-	-
International Equity	Large Core	-	-	CREF Stock Annuity	-
	Large Value	-	Causeway International Value I (CIVIX)	-	-
	Large Growth	Oppenheimer International Growth I (OIGIX)	-	American Funds EuroPac Growth R6 (RERGX)	American Funds EuroPac Growth R6 (RERGX)
	Emerging	JP Morgan Emerging Markets (JEMWX)	Harding Loevner Instl EM I (HLMEX)	American Funds New World R6 (RNWGX)	Vanguard Emerging Market Stock Index Adm (VEMAX)
Fixed Income	Core	JP Morgan Core Bond R6 (JCBUX)	-	TIAA-CREF Bond Index I (TBIIX)	Vanguard Total Bond Market Index I (VBTIX)
	Core Plus	-	MetWest Total Return Bond (MWTX)	-	-
Inflation Hedge	TIPS/Real Assets	Vanguard Inflation Protected Secs Adm (VAIPX)	PIMCO Real Return Inst (PRRIX)	CREF Inflation Linked Bond Annuity	DFA Inflation Protected Securities I (DIPSX)
Target Date/Balanced	Multi-Asset Class	T. Rowe Price Retirement / American Funds American Balanced R6 (RLBGX)	American Funds Target Date Retire R6 / Columbia Balanced Y (CBDYX)	TIAA-CREF Lifecycle Instl	Vanguard Target Retirement Inv
Cash & Equivalents	Money Market/Stable Value	General Fixed Interest Account	Vanguard Federal Money Market (VMFXX) / MetLife Gold Track Select	TIAA CREF Money Market Instl (TCIXX) TIAA Traditional Annuity	VALIC Fixed Interest
Other	Industry Sector/Socially Responsible		Principal Real Estate Securities I (PIREX)	CREF Real Estate Securities Fund (TIREX) / CREF Social Choice Annuity	Vanguard Health Care Adm (VGHAX)

Fund Monitor
September 30, 2020

Fund	Performance				Risk	Comment/Status
	3 Year vs Index	3 Year vs Peers	5 Year vs Index	5 Year vs Peers	Standard Deviation	
Vanguard Institutional Index	Pass	N/A	Pass	N/A	Pass	
MFS Value R5	Pass	Pass	Pass	Pass	Pass	
MassMutual Select Blue Chip Growth I	Fail	Pass	Fail	Pass	Pass	
Vanguard Mid Cap Index Inst	Pass	N/A	Pass	N/A	Pass	
Vanguard Small Cap Index Inst	Pass	N/A	Pass	N/A	Pass	
American Beacon Small Cp Val Inst	Fail	Pass	Fail	Pass	Pass	
INVESCO Small Cap Growth R6	Pass	Pass	Pass	Pass	Pass	
Oppenheimer International Growth I	Pass	Pass	Pass	Pass	Pass	
JP Morgan Emerging Markets R6	Pass	Pass	Pass	Pass	Pass	
American Funds American Balanced R6	Fail	Pass	Fail	Pass	Pass	To be removed January 2021
T. Rowe Price Retirement 2060	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2055	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2050	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2045	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2040	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2035	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2030	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2025	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2020	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2015	Pass	Pass	Pass	Pass	Pass	
T. Rowe Price Retirement 2010	Pass	Pass	Pass	Pass	Pass	
JP Morgan Core Bond R6	Pass	Pass	Pass	Pass	Pass	
Vanguard Inflation Protected Secs Adm	Fail	Pass	Fail	Pass	Pass	
General Fixed Interest Account	Pass	N/A	N/A	N/A	Pass	

Index funds must return within 30 basis points of their respective benchmarks

Actively managed funds must outperform respective benchmarks

Actively managed funds must rank in the top half of their respective peer universes

Fund Monitor

September 30, 2020

Fund	Performance				Risk Standard Deviation	Comment/Status
	3 Year vs Index	3 Year vs Peers	5 Year vs Index	5 Year vs Peers		
Vanguard Institutional Index	Pass	N/A	Pass	N/A	Pass	
JP Morgan Equity Income	Pass	Pass	Pass	Pass	Pass	
ClearBridge Large Cap Growth	Fail	Fail	Fail	Fail	Pass	
Vanguard Mid Cap Index	Pass	N/A	Pass	N/A	Pass	
Delaware Small Cap Core	Fail	Pass	Fail	Pass	Pass	
Victory Integrity Small Cap Value	Fail	Fail	Fail	Fail	Pass	
TRP QM US Small Cap Growth	Pass	Fail	Pass	Fail	Pass	
Causeway International Value	Fail	Fail	Fail	Pass	Pass	
Harding Loevner Emerging Markets	Fail	Fail	Fail	Fail	Pass	
Columbia Balanced	Fail	Pass	Fail	Pass	Pass	
American Funds 2060 Target Date	Pass	Pass	N/A	N/A	N/A	
American Funds 2055 Target Date	Pass	Pass	Pass	Pass	Pass	All of these investment options are mapping to funds in the Voya lineup in January 2021.
American Funds 2050 Target Date	Pass	Pass	Pass	Pass	Pass	
American Funds 2045 Target Date	Pass	Pass	Pass	Pass	Pass	
American Funds 2040 Target Date	Pass	Pass	Pass	Pass	Pass	
American Funds 2035 Target Date	Pass	Pass	Pass	Pass	Pass	
American Funds 2030 Target Date	Pass	Pass	Pass	Pass	Pass	
American Funds 2025 Target Date	Pass	Pass	Pass	Pass	Pass	
American Funds 2020 Target Date	Pass	Pass	Pass	Pass	Pass	
American Funds 2015 Target Date	Fail	Pass	Pass	Pass	Pass	
American Funds 2010 Target Date	Fail	Pass	Pass	Pass	Pass	
Principal Real Estate Securities	Pass	Pass	Pass	Pass	Pass	
MetWest Total Return Bond	Pass	Pass	Pass	Pass	Pass	
PIMCO Real Return	Fail	Pass	Fail	Pass	Pass	
Vanguard Federal Money Market	Fail	Pass	Fail	Pass	Pass	
Metlife Gold Track Select	Pass	N/A	Pass	N/A	Pass	

Index funds must return within 30 basis points of their respective benchmarks

Actively managed funds must outperform respective benchmarks

Actively managed funds must rank in the top half of their respective peer universes

Fund Monitor
September 30, 2020

Fund	Performance				Risk	Comment/Status
	3 Year vs Index	3 Year vs Peers	5 Year vs Index	5 Year vs Peers	Standard Deviation	
TIAA-CREF Equity Index	Pass	N/A	Pass	N/A	Pass	
TRP Instl Large Cap Value	Fail	Fail	Fail	Pass	Pass	
Vanguard Mid Cap Index	Pass	N/A	Pass	N/A	Pass	
TIAA-CREF Small Blend Index	Pass	N/A	Pass	N/A	Pass	
CREF Stock	Fail	Pass	Fail	Pass	Pass	
American Funds EuroPacific Growth	Pass	Pass	Pass	Pass	Pass	
American Funds New World	Pass	Pass	Pass	Pass	Pass	
CREF Social Choice	Pass	Pass	Pass	Pass	Pass	To be removed January 2021
TIAA-CREF Lifecycle 2060	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2055	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2050	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2045	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2040	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2035	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2030	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2025	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2020	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2015	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle 2010	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Lifecycle Retirement Income	Fail	Pass	Fail	Pass	Pass	
TIAA-CREF Real Estate Securities	Pass	Pass	Pass	Pass	Pass	To be removed January 2021
TIAA-CREF Bond Index	Pass	N/A	Pass	N/A	Pass	
CREF Inflation Linked Bond	Fail	Fail	Fail	Fail	Pass	Informal Review
TIAA-CREF Money Market	Fail	Pass	Fail	Pass	Pass	
TIAA Traditional	Pass	N/A	Pass	N/A	Pass	

Index funds must return within 30 basis points of their respective benchmarks

Actively managed funds must outperform respective benchmarks

Actively managed funds must rank in the top half of their respective peer universes

Fund Monitor
September 30, 2020

Fund	Performance				Risk Standard Deviation	Comment/Status
	3 Year vs Index	3 Year vs Peers	5 Year vs Index	5 Year vs Peers		
Vanguard Institutional Index	Pass	N/A	Pass	N/A	Pass	To be replaced January 2021
Vanguard Value Index	Pass	N/A	Pass	N/A	Pass	
T Rowe Price Large Cap Growth	Fail	Pass	Pass	Pass	Pass	To be replaced January 2021
Vanguard Mid Cap Index	Pass	N/A	Pass	N/A	Pass	
Vanguard Small Cap Index	Pass	N/A	Pass	N/A	Pass	
American Funds EuroPacific Growth	Pass	Pass	Pass	Pass	Pass	
Vanguard Emerging Market Index	Pass	N/A	Pass	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2060	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2055	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2050	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2045	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2040	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2035	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2030	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2025	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2020	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire 2015	Fail	N/A	Fail	N/A	Pass	To be replaced January 2021
Vanguard Target Retire Income	Pass	N/A	Pass	N/A	Pass	To be replaced January 2021
Vanguard Healthcare	Fail	Fail	Fail	Fail	Pass	To be removed January 2021
Vanguard Total Bond Market Index	Pass	N/A	Pass	N/A	Pass	
DFA Inflation Protected Securities	Pass	Pass	Pass	Pass	Pass	
Fixed Interest	Pass	N/A	Pass	N/A	Pass	

Index funds must return within 30 basis points of their respective benchmarks

Actively managed funds must outperform respective benchmarks

Actively managed funds must rank in the top half of their respective peer universes

State ORP (MassMutual)

Fund Line-Up Statistics September 30, 2020

Fund	Ticker	Net Expense Ratio (%)	5-Year Standard Deviation (%)	Return (%) 1 Year	Return (%) 3 Years	Return (%) 5 Years
Domestic Equity						
Vanguard Institutional Index I	VINIX	0.04	14.61	15.13	12.25	14.12
MFS Value R6	MEIKX	0.47	14.00	-1.05	4.45	9.07
MassMutual Select Blue Chip Growth I	MBCZX	0.64	15.76	34.96	20.05	19.79
Vanguard Mid Cap Index I	VMCIX	0.04	16.91	7.10	7.99	10.34
Vanguard Small Cap Index I	VSCIX	0.04	19.17	1.35	4.40	8.96
American Beacon Small Cap Value Instl	AVFIX	0.83	22.53	-15.06	-5.82	2.63
Invesco Small Cap Growth R6	GTSFX	0.71	19.46	31.06	13.54	11.48
International Equity						
Oppenheimer International Growth I	OIGIX	0.69	14.75	19.79	4.84	7.88
JP Morgan Emerging Markets R6	JEMWX	0.79	17.77	23.13	9.82	14.95
Balanced						
American Funds American Balanced R6	RLBGX	0.26	8.44	9.42	8.00	9.82
Target Date						
T. Rowe Price Retirement I 2060 I	TRPLX	0.52	13.33	10.66	7.66	10.54
T. Rowe Price Retirement I 2055 I	TRPNX	0.52	13.32	10.63	7.66	10.58
T. Rowe Price Retirement I 2050 I	TRPMX	0.52	13.30	10.70	7.66	10.61
T. Rowe Price Retirement I 2045 I	TRPKX	0.51	13.32	10.59	7.64	10.6
T. Rowe Price Retirement I 2040 I	TRPDX	0.51	12.90	10.55	7.62	10.52
T. Rowe Price Retirement I 2035 I	TRPJX	0.50	12.22	10.11	7.43	10.17
T. Rowe Price Retirement I 2030 I	TRPCX	0.49	11.40	9.75	7.24	9.78
T. Rowe Price Retirement I 2025 I	TRPHX	0.46	10.41	9.29	6.93	9.23
T. Rowe Price Retirement I 2020 I	TRBRX	0.42	9.33	8.66	6.60	8.61
T. Rowe Price Retirement I 2015 I	TRFGX	0.40	8.23	8.34	6.25	7.87
T. Rowe Price Retirement I 2010 I	TRPAX	0.37	7.40	7.96	6.00	7.31
Fixed Income						
JPMorgan Core Bond R6	JCBUX	0.34	3.30	6.84	5.40	4.27
Vanguard Inflation-Protected Securities Adm	VAIPX	0.10	3.53	9.80	5.63	4.46
Stable Value						
General Fixed Interest	N/A	0.16	N/A	2.77	2.74	N/A

Expense Ratio and Standard Deviation: Lower is better

Return: Higher is better

State ORP (MetLife)

Fund Line-Up Statistics September 30, 2020

Fund	Ticker	Net Expense Ratio (%)	5-Year Standard Deviation (%)	Return (%) 1 Year	Return (%) 3 Years	Return (%) 5 Years
Domestic Equity						
Vanguard Institutional Index I	VINIX	0.04	14.61	15.13	12.25	14.12
JPMorgan Equity Income R63	OIEJX	0.49	13.81	-1.84	6.06	9.80
ClearBridge Large Cap Growth I	SBLIX	0.75	15.32	31.32	19.40	18.33
Vanguard Mid Cap Index I	VMCIX	0.04	16.91	7.10	7.99	10.34
Delaware Small Cap Core I	DCCIX	0.85	19.27	-4.24	0.66	7.38
Victory Integrity Small-Cap Value R63	MVSSX	0.96	23.00	-21.56	-8.34	0.76
T. Rowe Price Diversified Small Cap Growth	PRDSX	0.79	17.60	9.89	9.82	12.18
International Equity						
Causeway International Value Instl	CIVIX	0.90	17.06	-7.83	-5.25	1.22
Harding Loevner Instl Emerging Markets I	HLMEX	1.27	18.06	4.11	0.14	7.96
Balanced						
Columbia Balanced Y3	CBDYX	0.61	9.74	13.86	8.99	9.79
Target Date						
American Funds 2060 Trgt Date Retire R6	RFUTX	0.41	12.34	14.49	9.28	11.59
American Funds 2055 Trgt Date Retire R6	RFKTX	0.40	12.38	14.56	9.30	11.63
American Funds 2050 Trgt Date Retire R6	RFITX	0.39	12.39	14.63	9.34	11.65
American Funds 2045 Trgt Date Retire R6	RFHTX	0.38	12.21	14.30	9.18	11.52
American Funds 2040 Trgt Date Retire R6	RFGTX	0.38	11.97	14.07	9.05	11.34
American Funds 2035 Trgt Date Retire R6	RFFTIX	0.37	11.24	13.46	8.75	10.99
American Funds 2030 Trgt Date Retire R6	RFETX	0.35	9.44	11.76	7.93	9.96
American Funds 2025 Trgt Date Retire R6	RFDTX	0.33	7.93	11.04	7.34	8.91
American Funds 2020 Trgt Date Retire R6	RRCTX	0.31	6.71	8.56	6.30	7.78
American Funds 2015 Trgt Date Retire R6	RFJTX	0.31	6.26	7.38	5.67	7.11
American Funds 2010 Trgt Date Retire R6	RFTTX	0.31	5.75	7.07	5.37	6.79
Specialty						
Principal Real Estate Securities Instl	PIREX	0.91	15.28	-10.87	4.84	6.58
Fixed Income						
Metropolitan West Total Return Bond Plan	MWTSX	0.38	3.16	8.09	5.83	4.53
PIMCO Real Return Instl	PRRIX	0.53	3.81	10.86	5.79	4.80
MMF/Stable Value						
Vanguard Federal Money Market Inv	VMFXX	0.11	0.23	0.87	1.54	1.10
Gold Track Select	N/A	0.00	0.17	1.50	1.75	2.17

Expense Ratio and Standard Deviation: Lower is better

Return: Higher is better

State ORP (TIAA)

Fund Line-Up Statistics September 30, 2020

Fund	Ticker	Net Expense Ratio (%)	5-Year Standard Deviation (%)	Return (%) 1 Year	Return (%) 3 Years	Return (%) 5 Years
Domestic Equity						
TIAA-CREF Equity Index Instl	TIEIX	0.05	15.21	14.94	11.59	13.65
T. Rowe Large Cap Value I	TILCX	0.56	15.30	-8.83	1.13	7.46
Vanguard Mid Cap Index I	VMCIX	0.04	16.91	7.10	7.99	10.34
TIAA-CREF Small-Cap Blend Index Instl	TISBX	0.06	19.93	0.63	1.92	8.15
International Equity						
CREF Stock R3	QCSTIX	0.21	15.02	11.30	7.56	10.74
American Funds Europacific Growth R6	RERGX	0.46	14.87	14.97	5.67	9.08
American Funds New World R6	RNWGX	0.60	14.61	14.50	7.70	11.37
Balanced						
CREF Social Choice R3	QCSCIX	0.17	9.05	9.14	7.47	8.69
Target Date						
TIAA-CREF Lifecycle 2060 Instl	TLXNX	0.45	14.34	11.60	7.30	10.52
TIAA-CREF Lifecycle 2055 Instl	TTRIX	0.45	14.18	11.52	7.26	10.44
TIAA-CREF Lifecycle 2050 Instl	TFTIX	0.45	14.05	11.47	7.25	10.41
TIAA-CREF Lifecycle 2045 Instl	TTFIX	0.45	13.89	11.33	7.24	10.31
TIAA-CREF Lifecycle 2040 Instl	TCOIX	0.44	13.02	10.82	7.14	10.09
TIAA-CREF Lifecycle 2035 Instl	TCIIX	0.43	11.88	10.32	7.00	9.62
TIAA-CREF Lifecycle 2030 Instl	TCRIX	0.42	10.70	9.85	6.78	9.11
TIAA-CREF Lifecycle 2025 Instl	TCYIX	0.41	9.52	9.24	6.55	8.56
TIAA-CREF Lifecycle 2020 Instl	TCWIX	0.39	8.35	8.61	6.24	8.01
TIAA-CREF Lifecycle 2015 Instl	TCNIX	0.38	7.56	8.36	6.06	7.49
TIAA-CREF Lifecycle 2010 Instl	TCTIX	0.37	6.86	7.96	5.87	7.11
TIAA-CREF Lifecycle Retirement Inc Instl	TLRIX	0.37	6.75	7.93	5.81	6.99
Specialty						
TIAA-CREF Real Estate Sec Instl	TIREX	0.50	14.51	-5.93	6.89	8.10
Fixed Income						
TIAA-CREF Bond Index Instl	TBIIX	0.11	3.21	6.79	5.08	4.01
CREF Inflation Linked Bond R3	QCILIX	0.22	2.65	7.31	4.32	3.49
MMF/Stable Value						
TIAA-CREF Money Market Instl	TCIXX	0.14	0.22	0.85	1.50	1.06
TIAA Traditional	N/A	0.00	0.12	3.25	3.79	3.94

Expense Ratio and Standard Deviation: Lower is better

Return: Higher is better

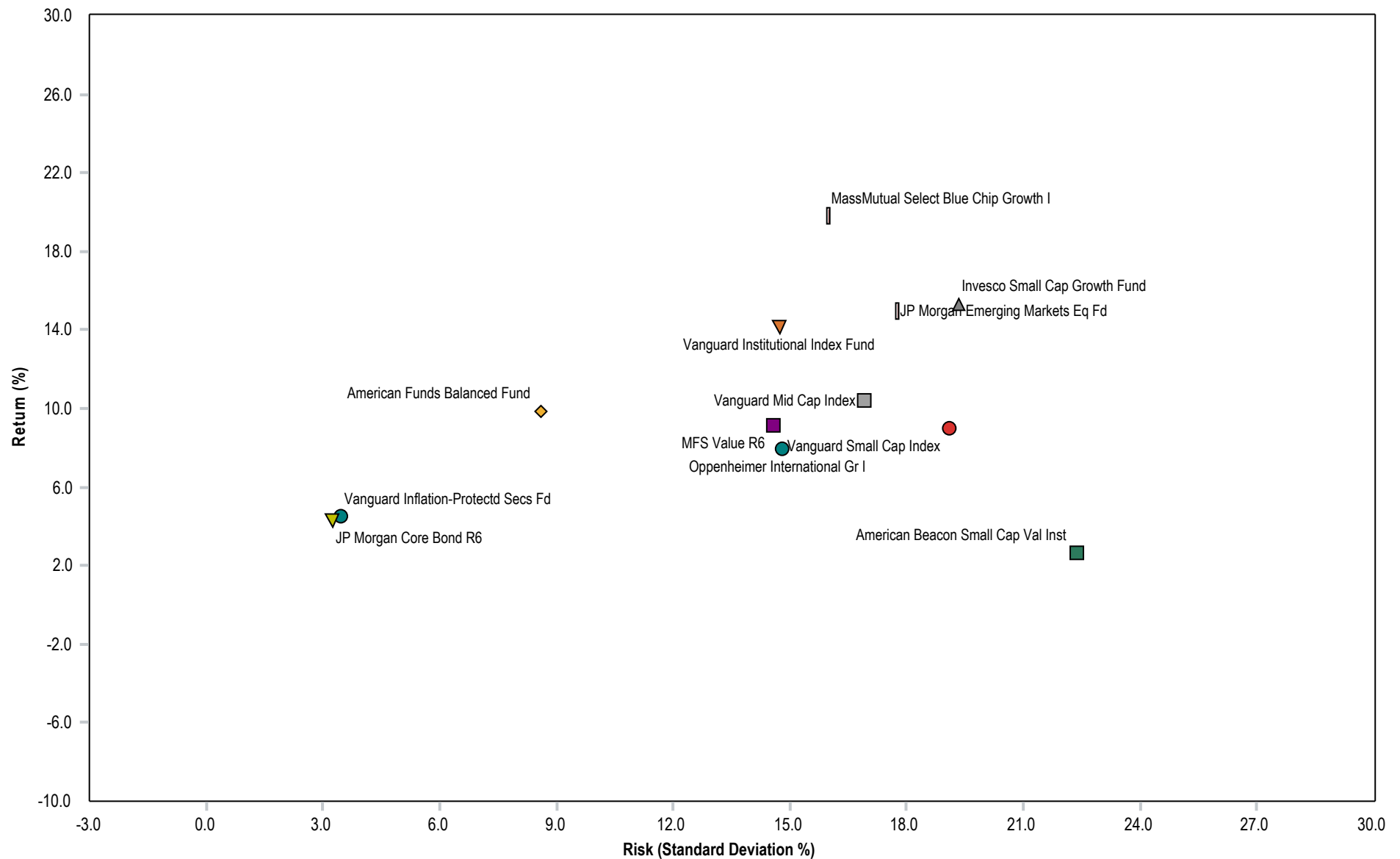
State ORP (AIG)

Fund Line-Up Statistics September 30, 2020

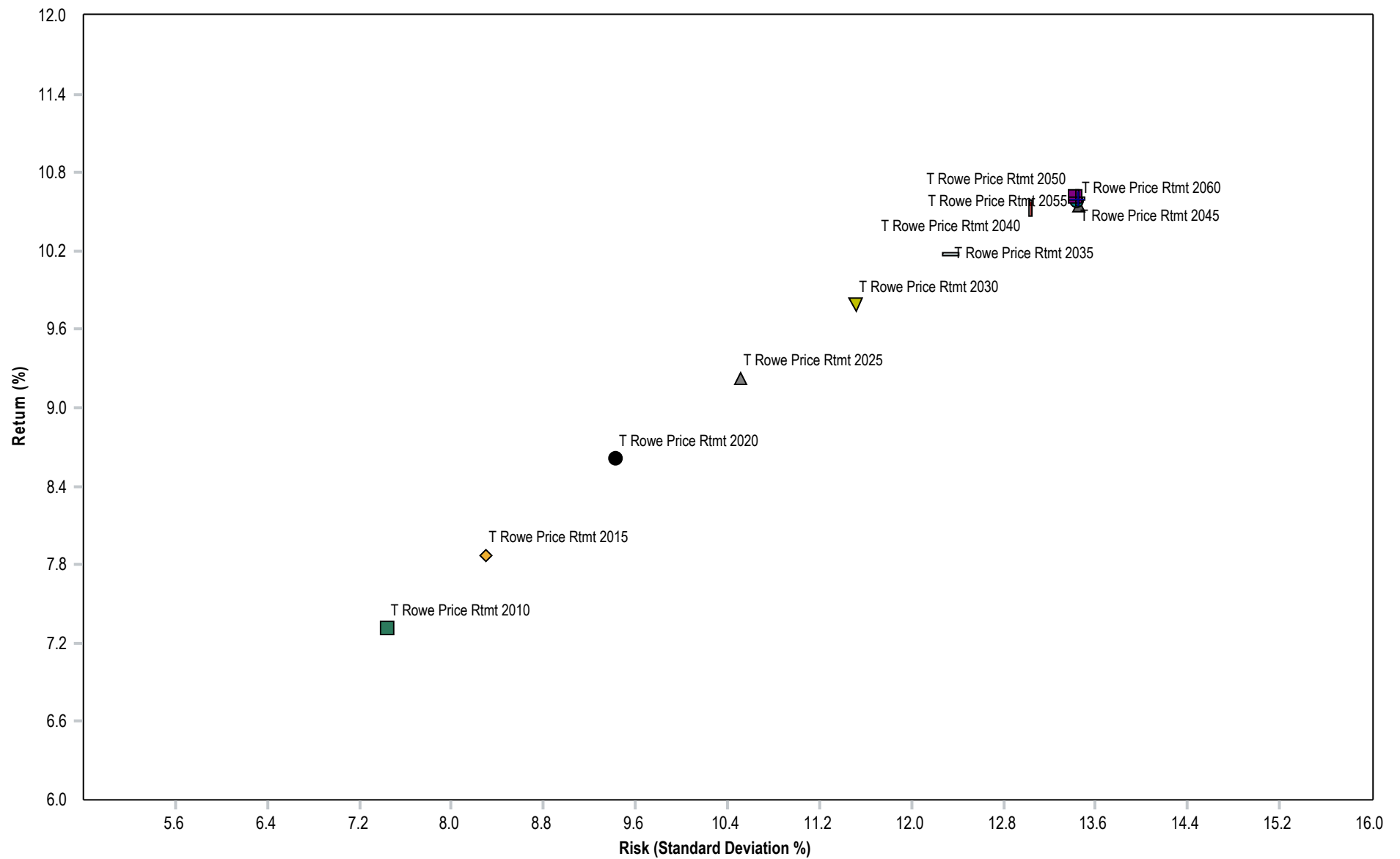
Fund	Ticker	Net Expense Ratio (%)	5-Year Standard Deviation (%)	Return (%) 1 Year	Return (%) 3 Years	Return (%) 5 Years
Domestic Equity						
Vanguard Institutional Index I	VINIX	0.04	14.61	15.13	12.24	14.12
Vanguard Value Index I	VIVIX	0.04	14.47	-3.29	4.38	9.26
T. Rowe Price Instl Large Cap Growth	TRLGX	0.56	16.45	35.80	21.09	20.61
Vanguard Mid Cap Index I	VMCIX	0.04	16.91	7.10	7.99	10.34
Vanguard Small Cap Index I	VSCIX	0.04	19.17	1.35	4.40	8.96
International Equity						
American Funds Europacific Growth R6	RERGX	0.46	14.87	14.97	5.67	9.08
Vanguard Emerging Markets	VEMAX	0.14	16.99	9.75	2.50	8.20
Target Date						
Vanguard Target Retirement 2060 Inv	VTTSX	0.15	12.99	10.25	7.31	10.12
Vanguard Target Retirement 2055 Inv	VFFVX	0.15	12.99	10.25	7.31	10.12
Vanguard Target Retirement 2050 Inv	VFIFX	0.15	13.00	10.26	7.32	10.13
Vanguard Target Retirement 2045 Inv	VTIVX	0.15	13.00	10.27	7.32	10.13
Vanguard Target Retirement 2040 Inv	VFORX	0.14	12.17	9.96	7.27	9.97
Vanguard Target Retirement 2035 Inv	VTTHX	0.14	11.12	9.71	7.16	9.53
Vanguard Target Retirement 2030 Inv	VTHRX	0.14	10.06	9.38	7.04	9.07
Vanguard Target Retirement 2025 Inv	VTTVX	0.13	9.01	9.04	6.89	8.60
Vanguard Target Retirement 2020 Inv	VTW NX	0.13	7.73	8.51	6.54	7.96
Vanguard Target Retirement 2015 Inv	VTXVX	0.13	5.97	7.68	6.09	7.04
Vanguard Target Retirement Income Inv	VTINX	0.12	4.83	7.35	5.79	6.03
Specialty						
Vanguard Health Care Adm	VGHAX	0.27	14.63	25.84	10.47	9.68
Fixed Income						
Vanguard Total Bond Market Index I	VBTIX	0.04	3.30	7.05	5.32	4.31
DFA Inflation-Protected Securities I	DIPSX	0.11	3.84	10.45	5.98	4.68
MMF/Stable Value						
Fixed Interest Option	N/A	0.00	0.03	2.15	2.11	2.13

Expense Ratio and Standard Deviation: Lower is better

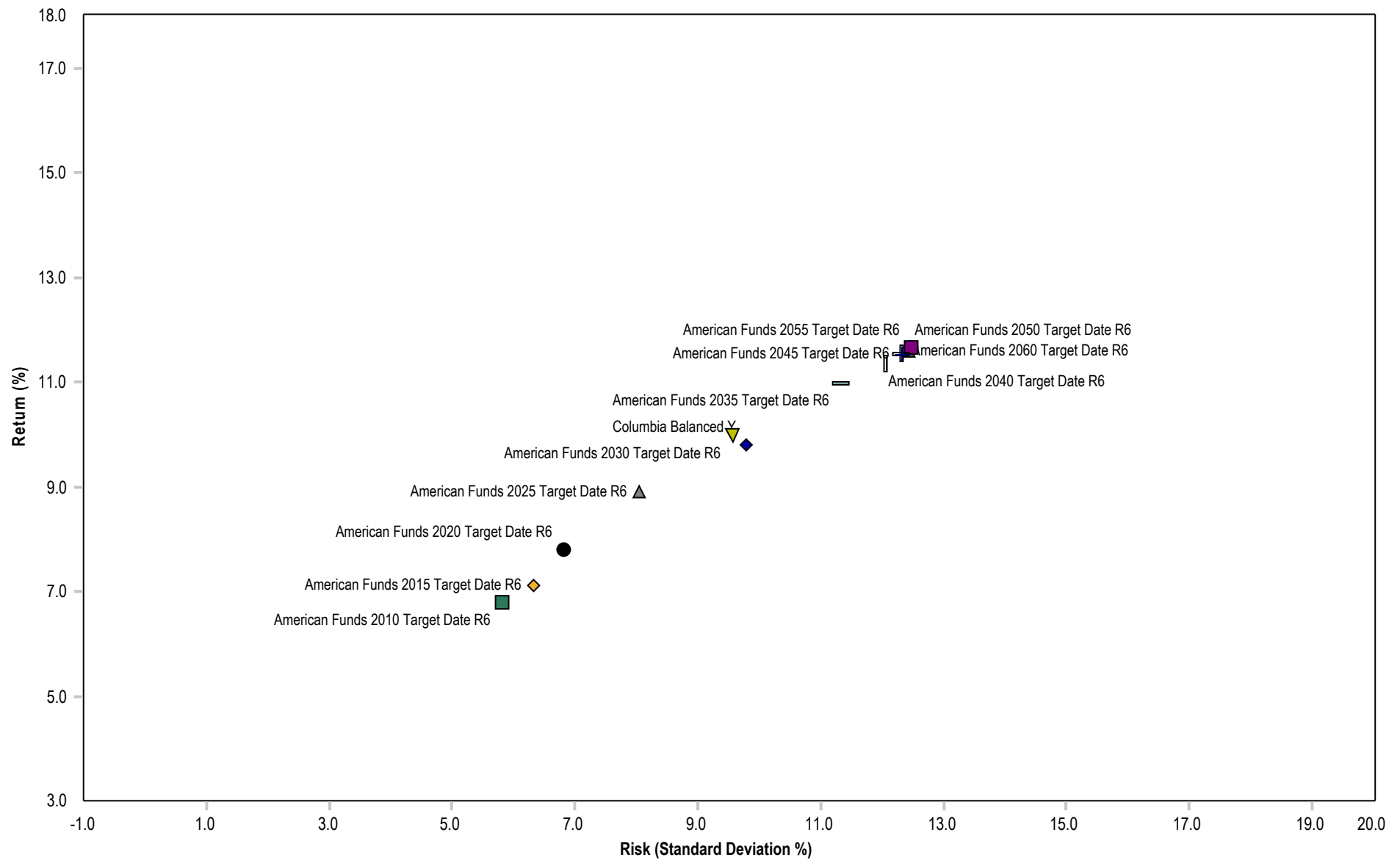
Return: Higher is better



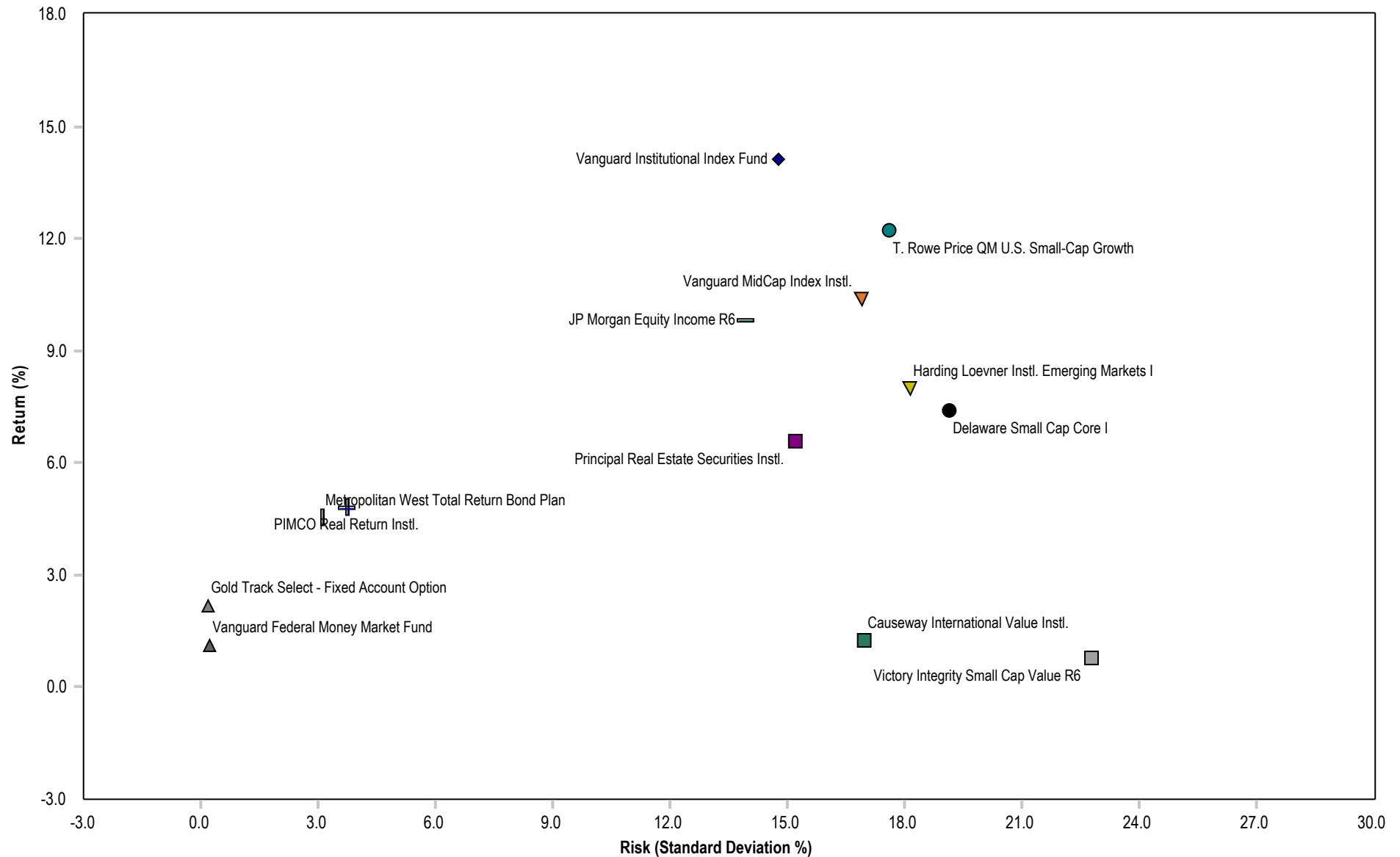
Calculation based on monthly periodicity.



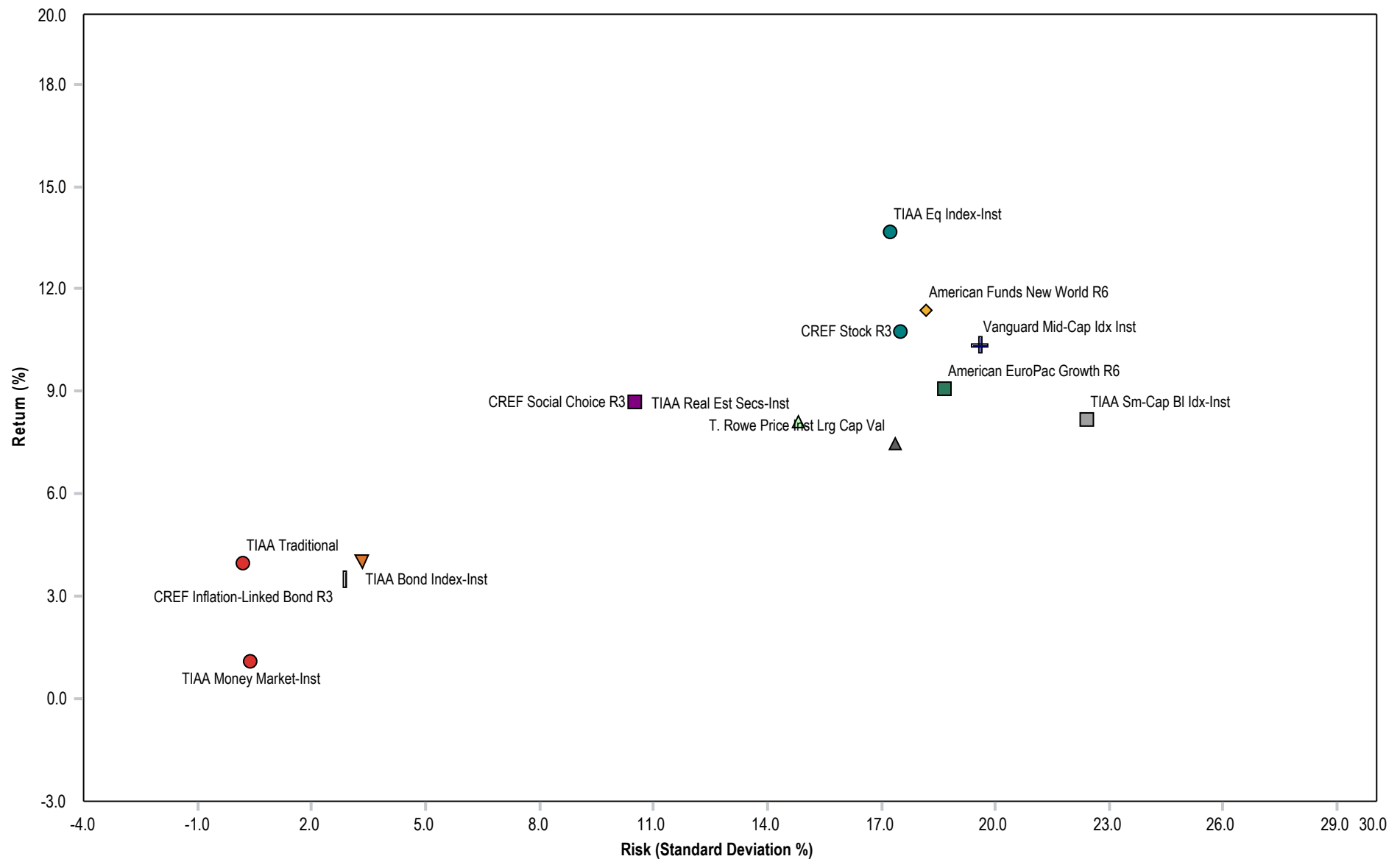
Calculation based on monthly periodicity.



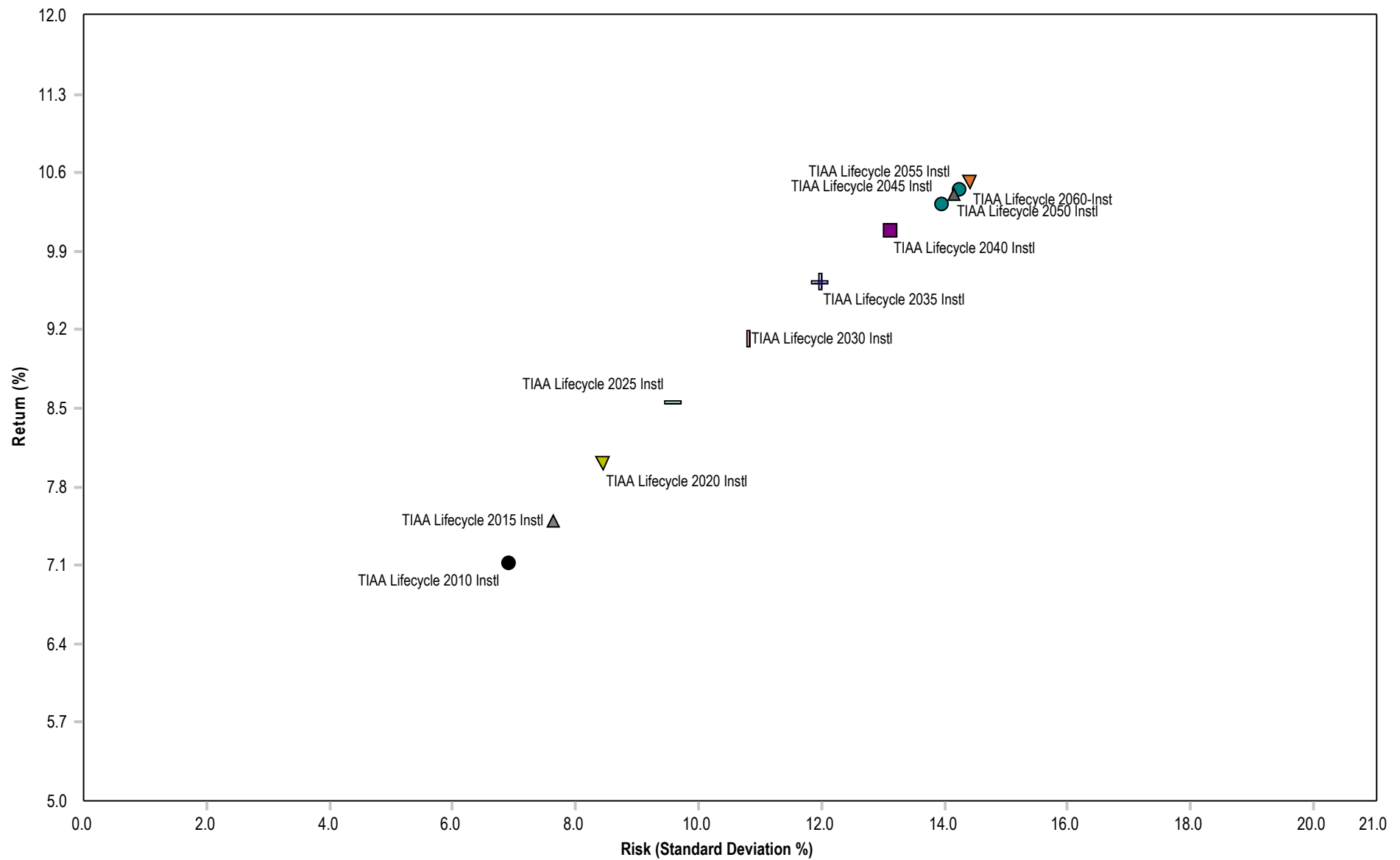
Calculation based on monthly periodicity.



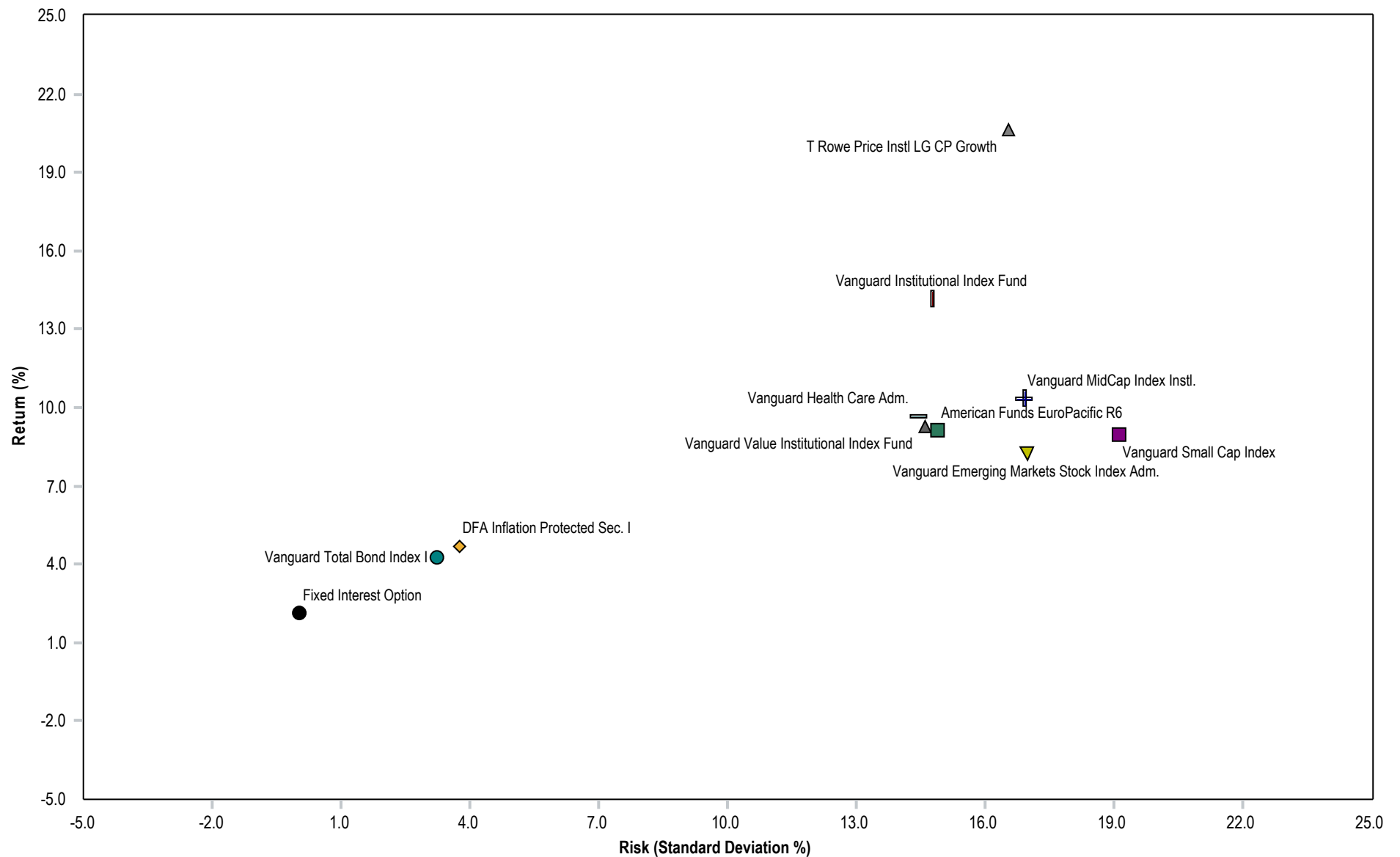
Calculation based on monthly periodicity.



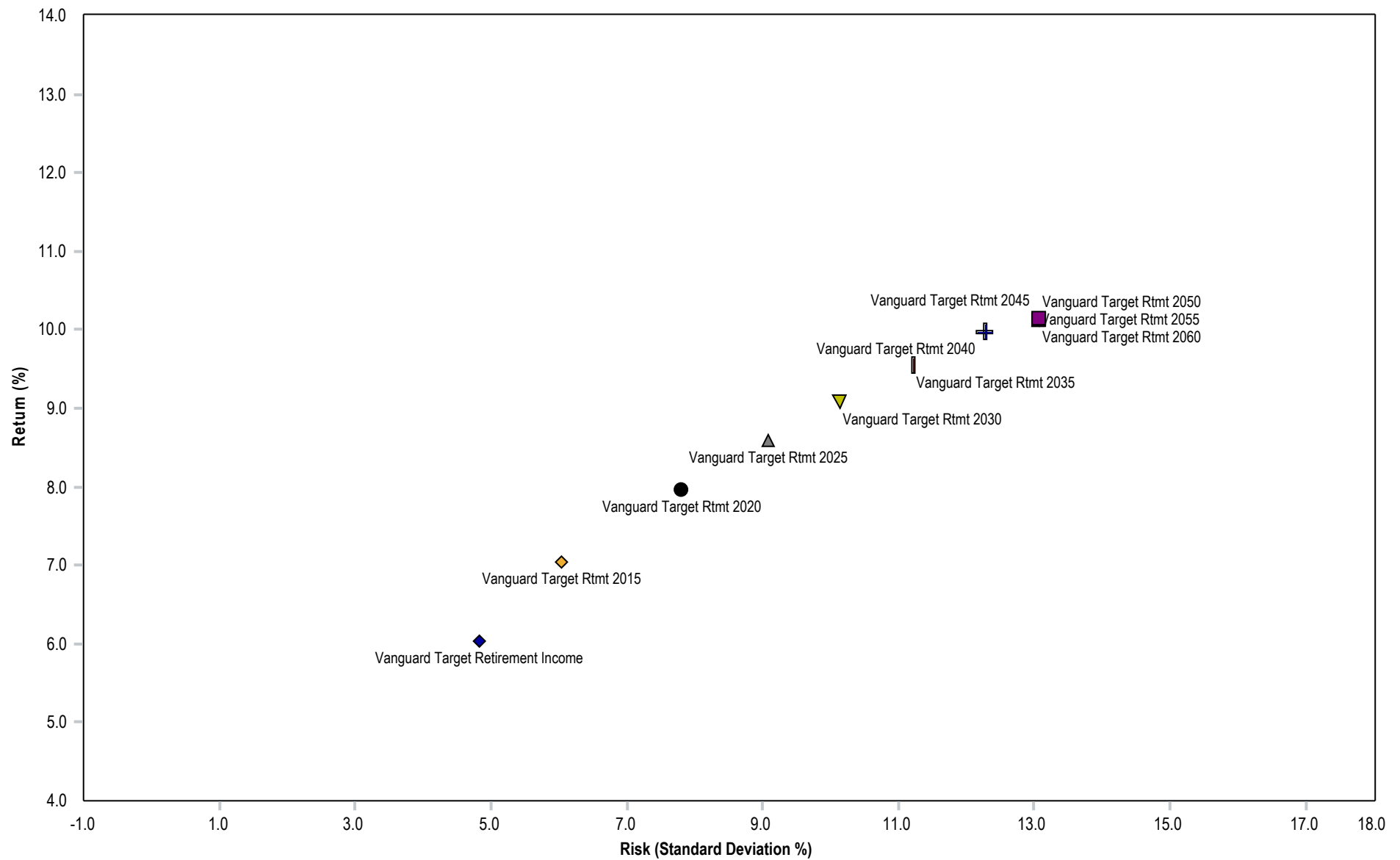
Calculation based on quarterly periodicity.



Calculation based on monthly periodicity.



Calculation based on monthly periodicity.



Calculation based on monthly periodicity.

PUBLIC EMPLOYEE BENEFIT AUTHORITY AGENDA ITEM
Retirement Policy Committee

Meeting Date: December 2, 2020

1. Subject: Deferred Compensation Program Plan Summary Report

2. Summary: Nancy Ornduff from Empower will present the SC Deferred Compensation Program (SCDCP) Plan Summary Report for the quarter ending September 30, 2020.

3. What is Committee asked to do? Receive as information

4. Supporting Documents:

(a) Attached: 3rd Quarter 2020 Performance Summary

Quarterly Review

Period ended September 30, 2020

Presented December 2, 2020

Administered by:

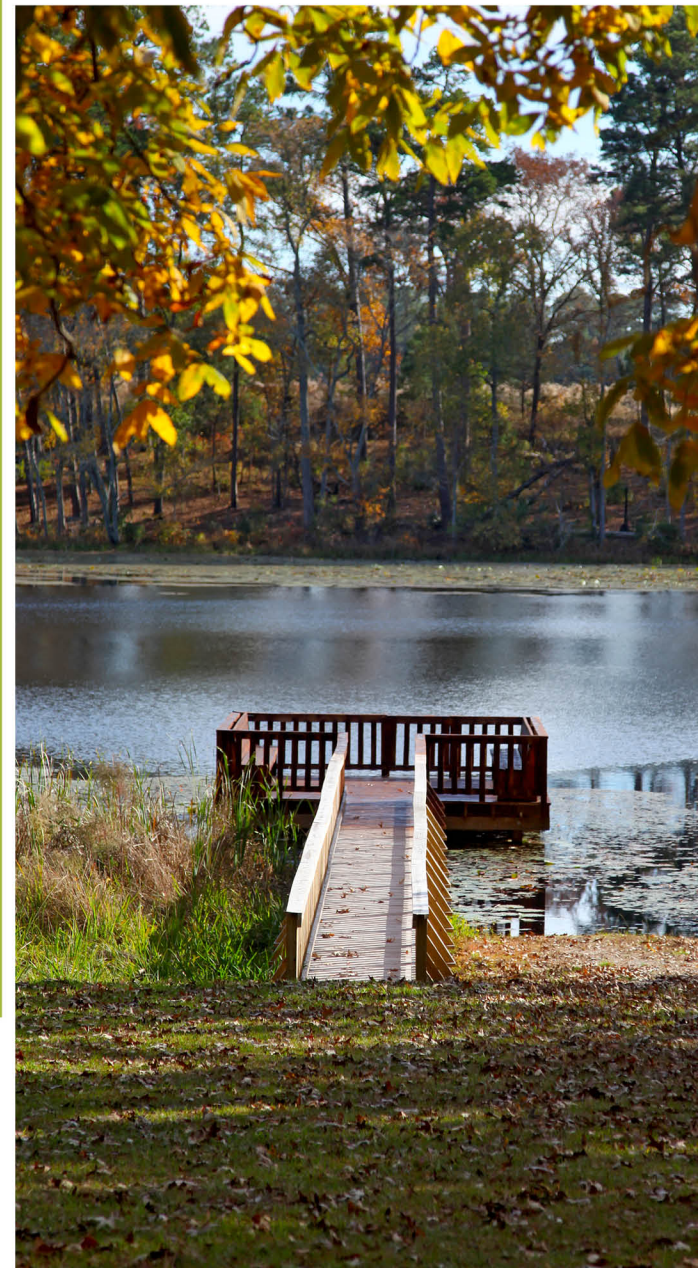


Table of Contents

- 2020 Market volatility and CARES Act activity
- Plan Statistics
- Participant Education
- Participant Engagement
- Website and Call Center statistics

2020 Market volatility and CARES Act activity



2020 Market - Investment Transfer Activity

- 1,662 participants initiated 5,260 total fund to fund investment transactions between February 16, 2020, and September 30, 2020, with total money movement of \$185,508,652.
- Average of total funds moved by 1,662 participants is \$111,618.
- Total money movement of \$185,508,652 represents 3.9 percent of the total assets under administration (\$4,801,305,472).*
- Comparison with clients with a similar number of participants:
 - 38.9 percent less participants executed an investment transaction during this time period (1,662 unique participants vs. peer average of 2,721.50 participants during same time period).
 - 20.2 percent less total investment transactions (5,260 total investment transactions vs. peer average of 6,587.67 total investment transactions during same time period).
 - 40.9 percent less total money movement (\$185,508,652 vs. peer average of \$313,966,576.00 total money movement during same time period).

**Participants with balances and assets under administration as of 9.30.2020.*

CARES Act loans and withdrawals

July 1 - September 30, 2020

	COVID-19 Withdrawals (Number)	COVID-19 Withdrawals (Dollars)	COVID-19 New Loans (Number)	COVID-19 New Loans (Dollars)	COVID-19 Loan Payment Suspensions
401(k)	427	\$4,441,272	3	\$98,000	17
457	90	\$694,093	0	\$0	0
TOTAL	517	\$5,135,365	3	\$98,000	17

Since inception (April 21 – September 30, 2020)

	COVID-19 Withdrawals (Number)	COVID-19 Withdrawals (Dollars)	COVID-19 New Loans (Number)	COVID-19 New Loans (Dollars)	COVID-19 Loan Payment Suspensions
401(k)	669	\$6,813,689	7	\$189,025	31
457	126	\$979,404	1	\$21,547	6
TOTAL	795	\$7,793,093	8	\$210,572	37



CORONAVIRUS AID, RELIEF, AND ECONOMIC SECURITY ACT (CARERS ACT)
ADDED RELIEF FOR RETIREMENT PLAN PARTICIPANTS

As you know, the current pandemic has changed the way we are socializing, working and living every day. But it's also causing unprecedented financial hardships and hurdles for millions of individuals, families, households and businesses across the country as they attempt to push forward.

In an effort to provide support and protection to the increasing number of people who have been financially impacted by the COVID-19 crisis, Congress passed the Coronavirus Aid, Relief, and Economic Security Act (CARERS ACT). Amongst the relief at those in need, from laid-off employees to small-business owners to retirement savers, the massive stimulus package includes several retirement plan provisions. Please take a moment to learn more about how the CARES Act may affect you and your South Carolina Deferred Compensation Program (Deferred Comp) account.

Administered by
EMPOWER
RETIREMENT

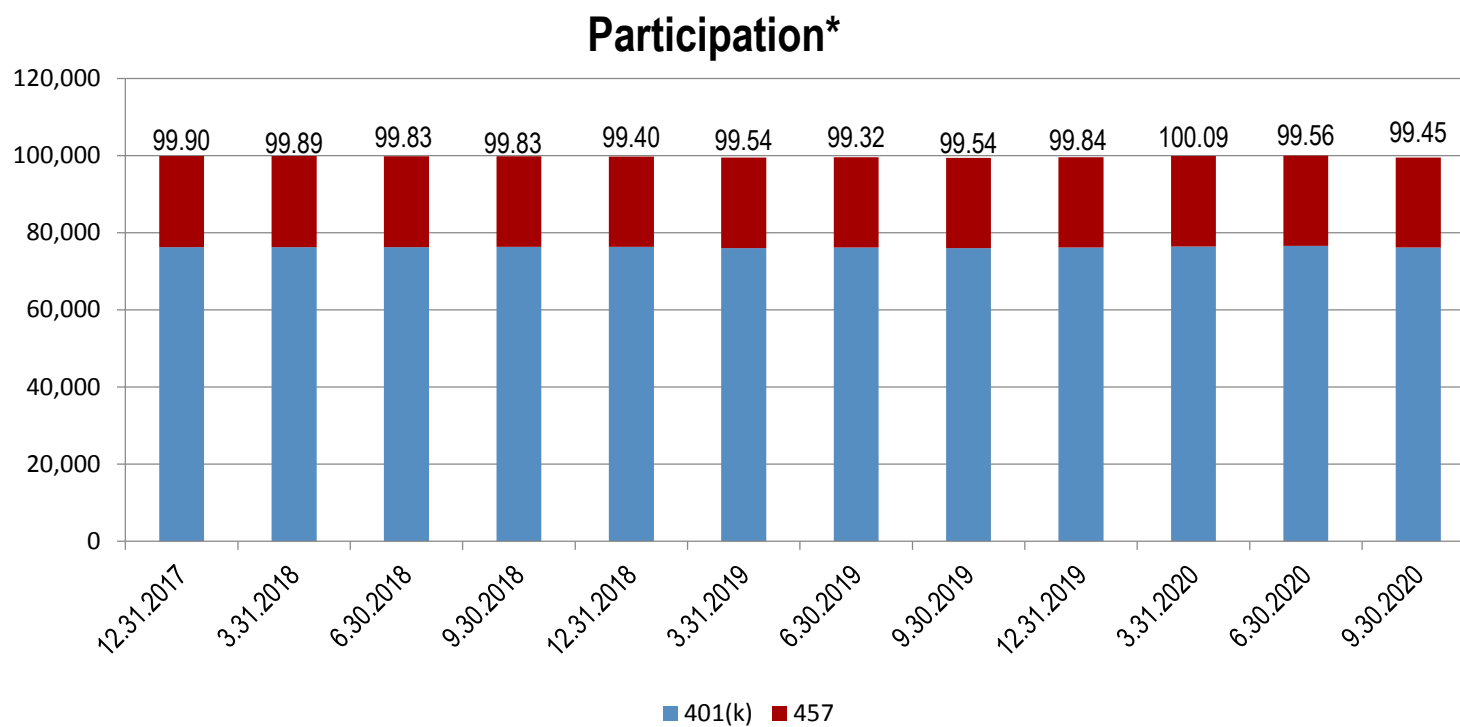
CARES Act participant flyer

Plan Statistics



Participants

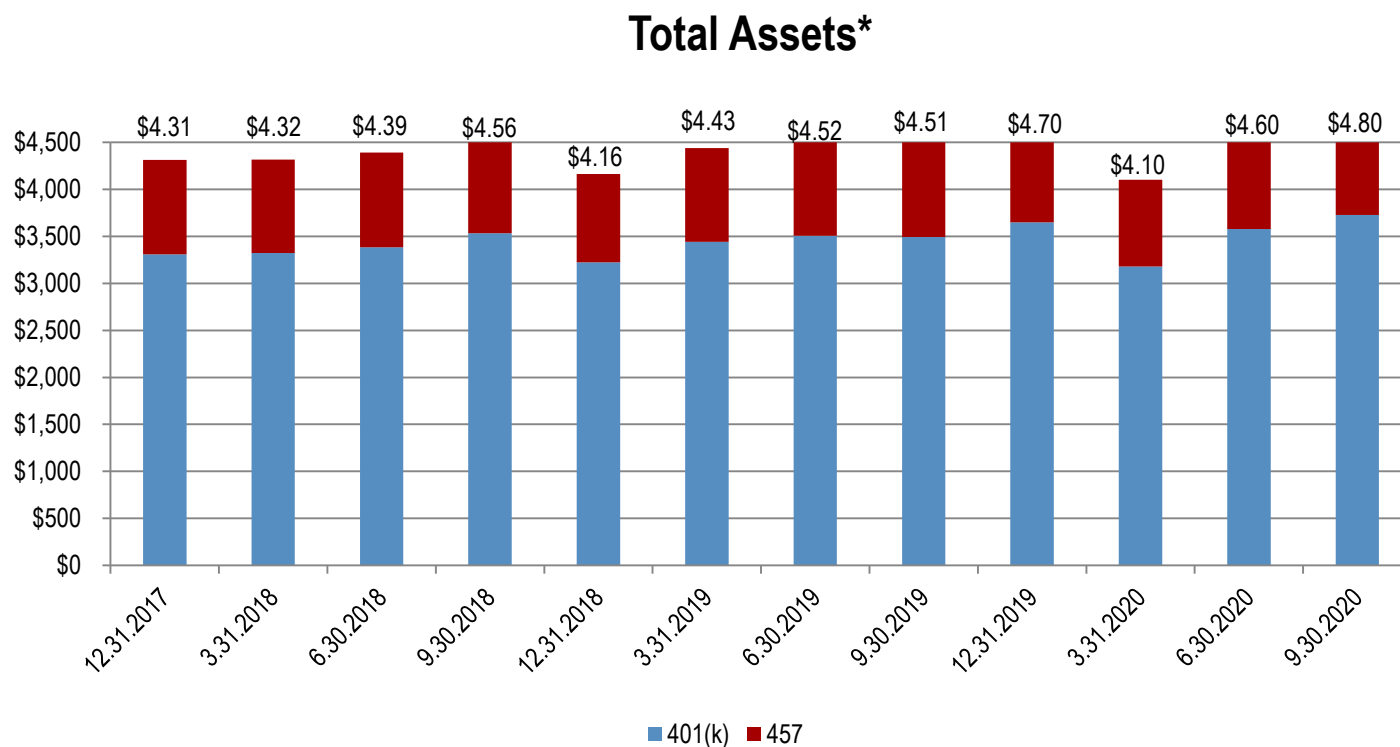
	401(k) Plan	457 Plan	Total
As of 09.30.2020	76,148	23,310	99,458



*In thousands

Assets

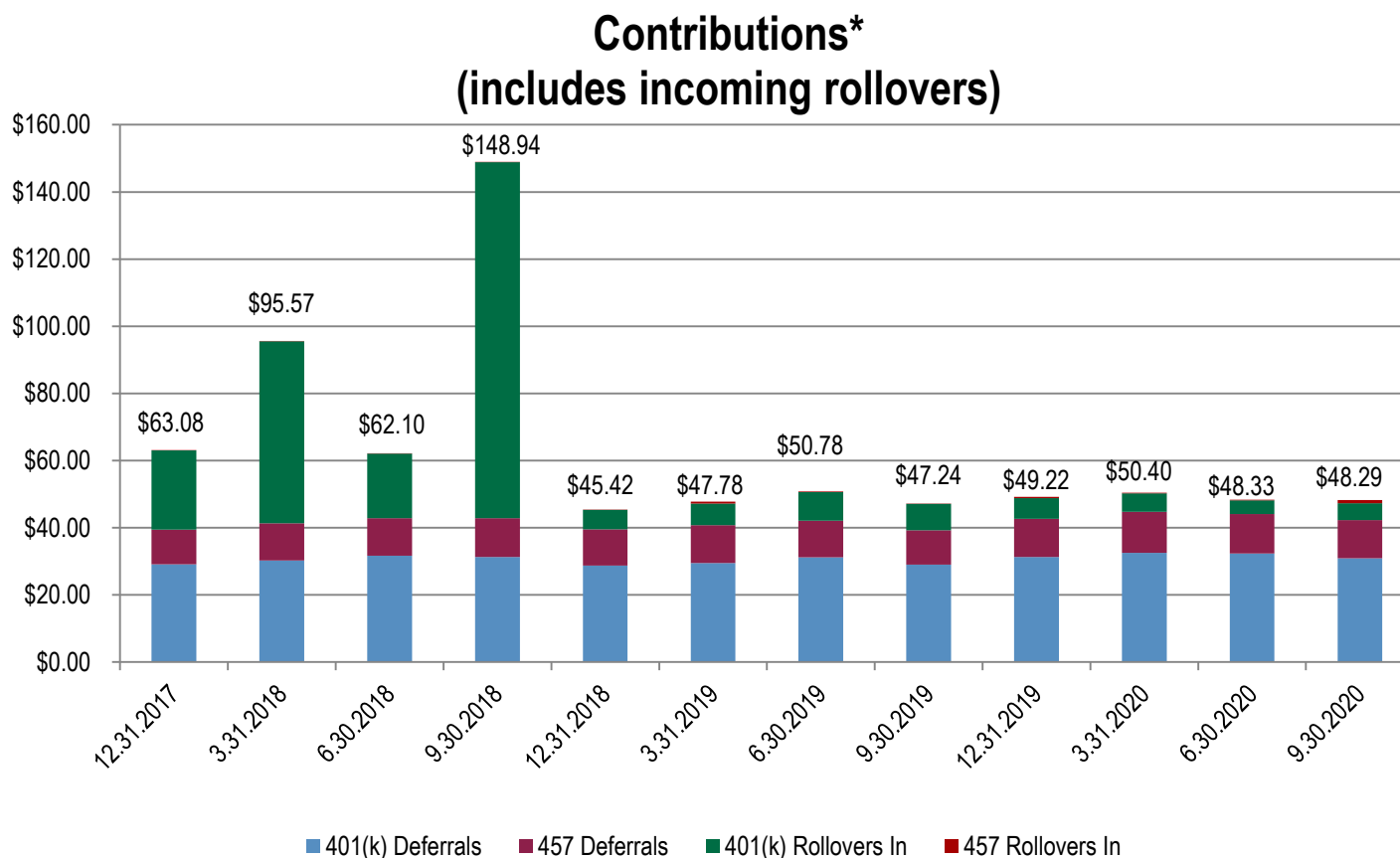
	401(k) Plan	457 Plan	Total
As of 09.30.2020	\$3,726,631,857	\$1,072,161,273	\$4,798,793,130



*In billions

Contributions

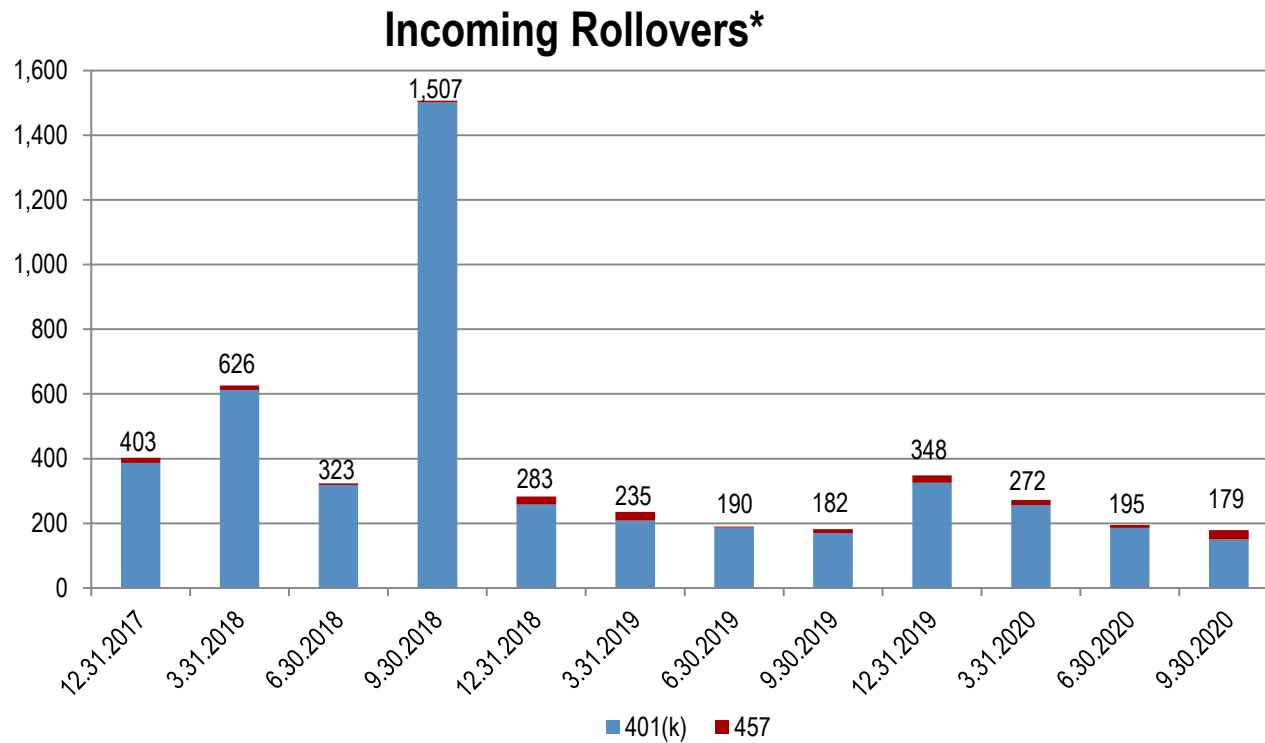
	401(k) Deferrals	401(k) Rollovers In	457 Deferrals	457 Rollovers In
Quarter ended 09.30.2020	\$30,884,674.11	\$5,038,664.89	\$11,389,220.74	\$978,452.26



*In millions

Incoming Rollovers

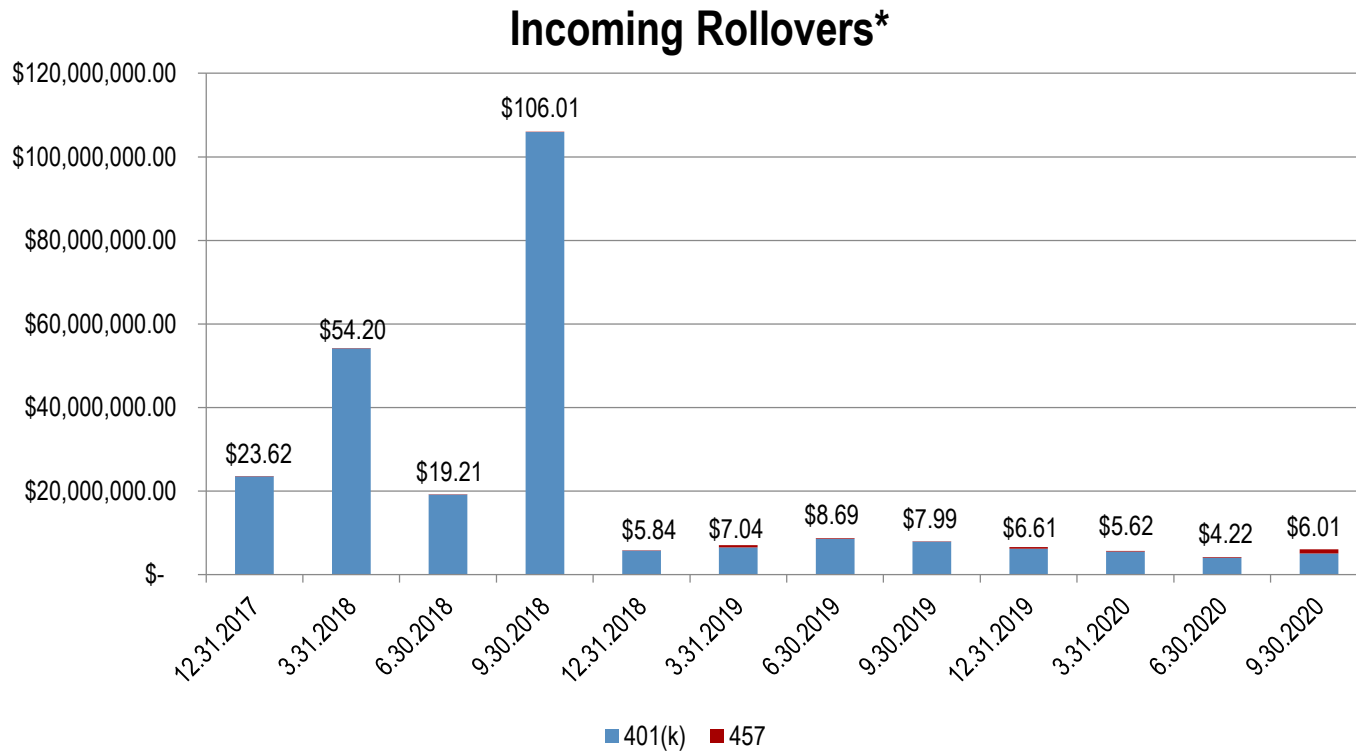
	401(k) Rollovers In	457 Rollovers In	Total
Quarter ended 09.30.2020	150	29	179



*Count

Incoming Rollovers

	401(k) Rollovers In	457 Rollovers In	Total
Quarter ended 09.30.2020	\$5,038,664.89	\$978,452.26	\$6,017,117.15

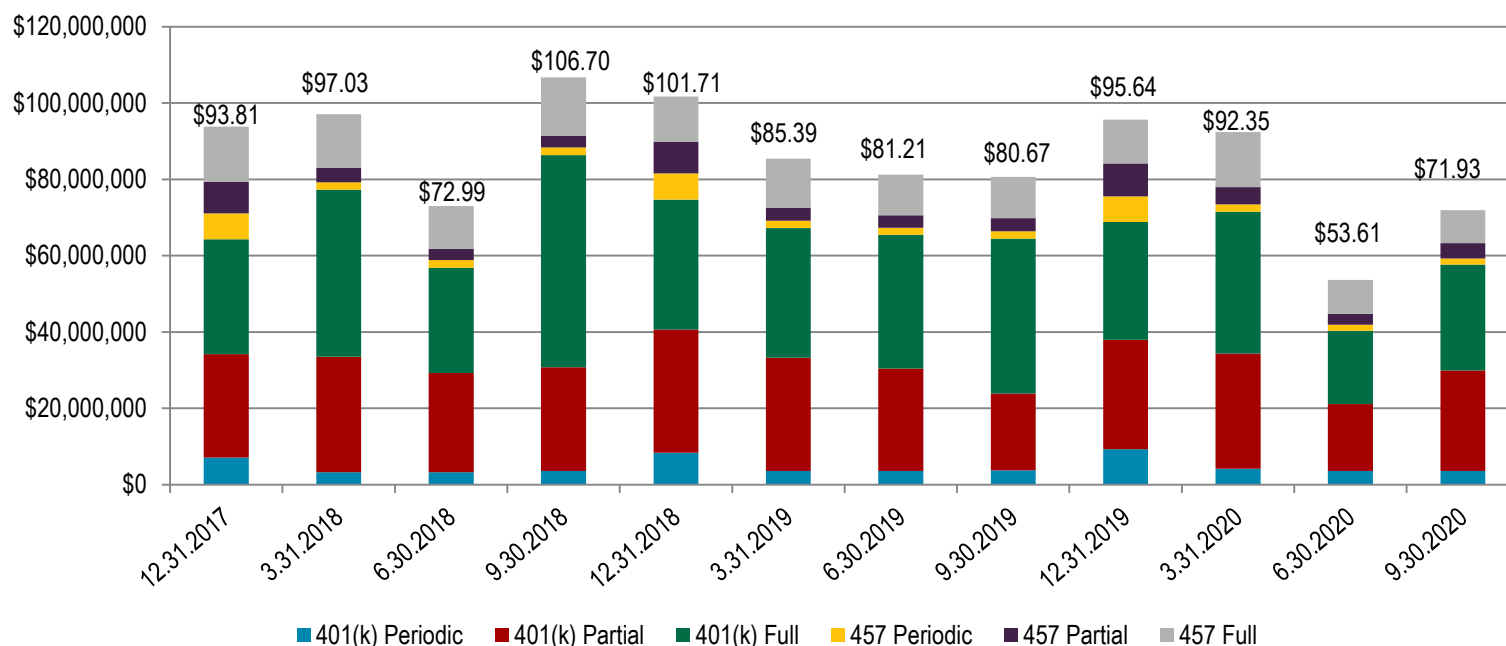


*In millions

Distributions

	401(k) Periodic	401(k) Partial	401(k) Full	457 Periodic	457 Partial	457 Full
Quarter ended 09.30.2020	\$3,616,425	\$26,336,742	\$27,721,454	\$1,617,008	\$3,970,893	\$8,668,701

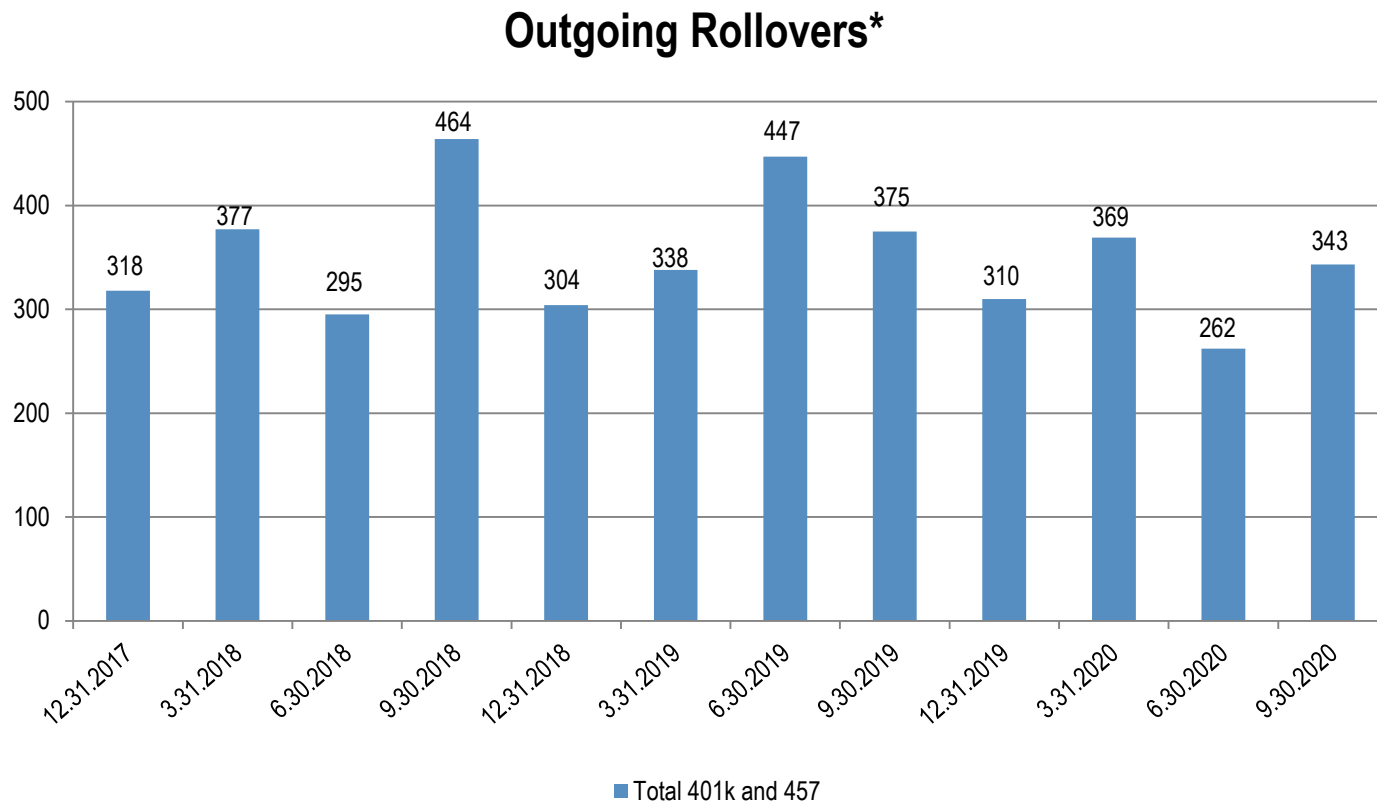
Distributions* (includes outgoing rollovers)



*In millions

Outgoing Rollovers

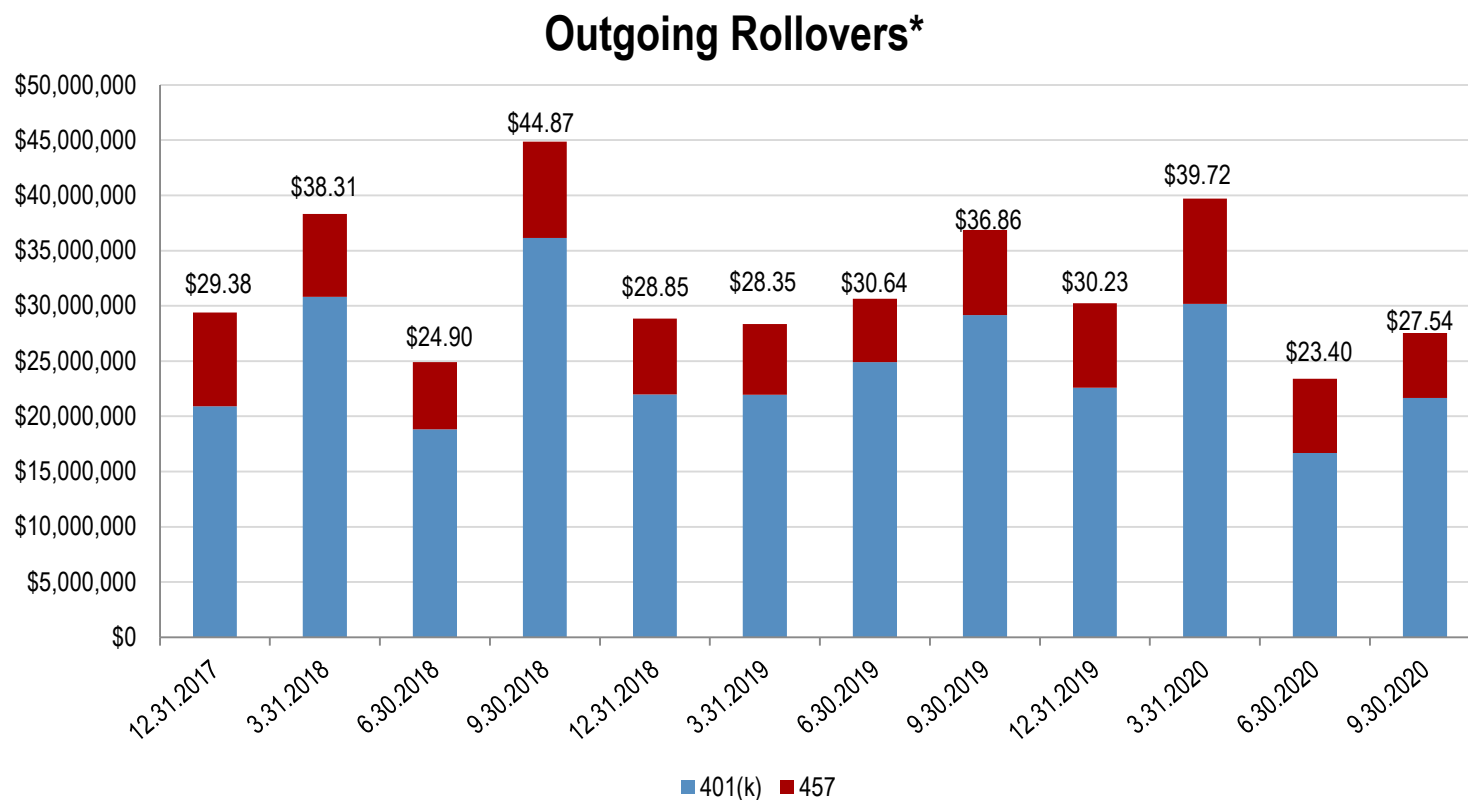
	401(k) Rollovers Out	457 Rollovers Out	Total
Quarter ended 09.30.2020	256	87	343



*Count

Outgoing Rollovers

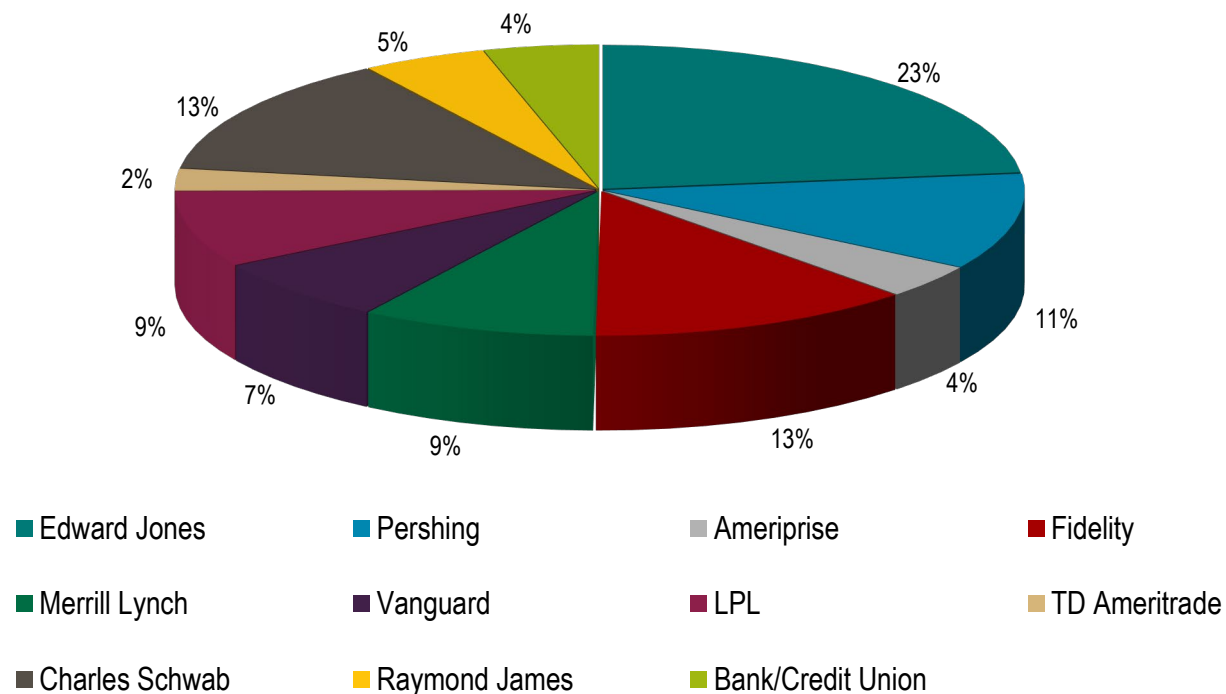
	401(k) Rollovers Out	457 Rollovers Out	Total
Quarter ended 09.30.2020	\$21,656,091.60	\$5,884,633.07	\$27,540,724.67



*In millions

Outgoing Rollovers by Vendor

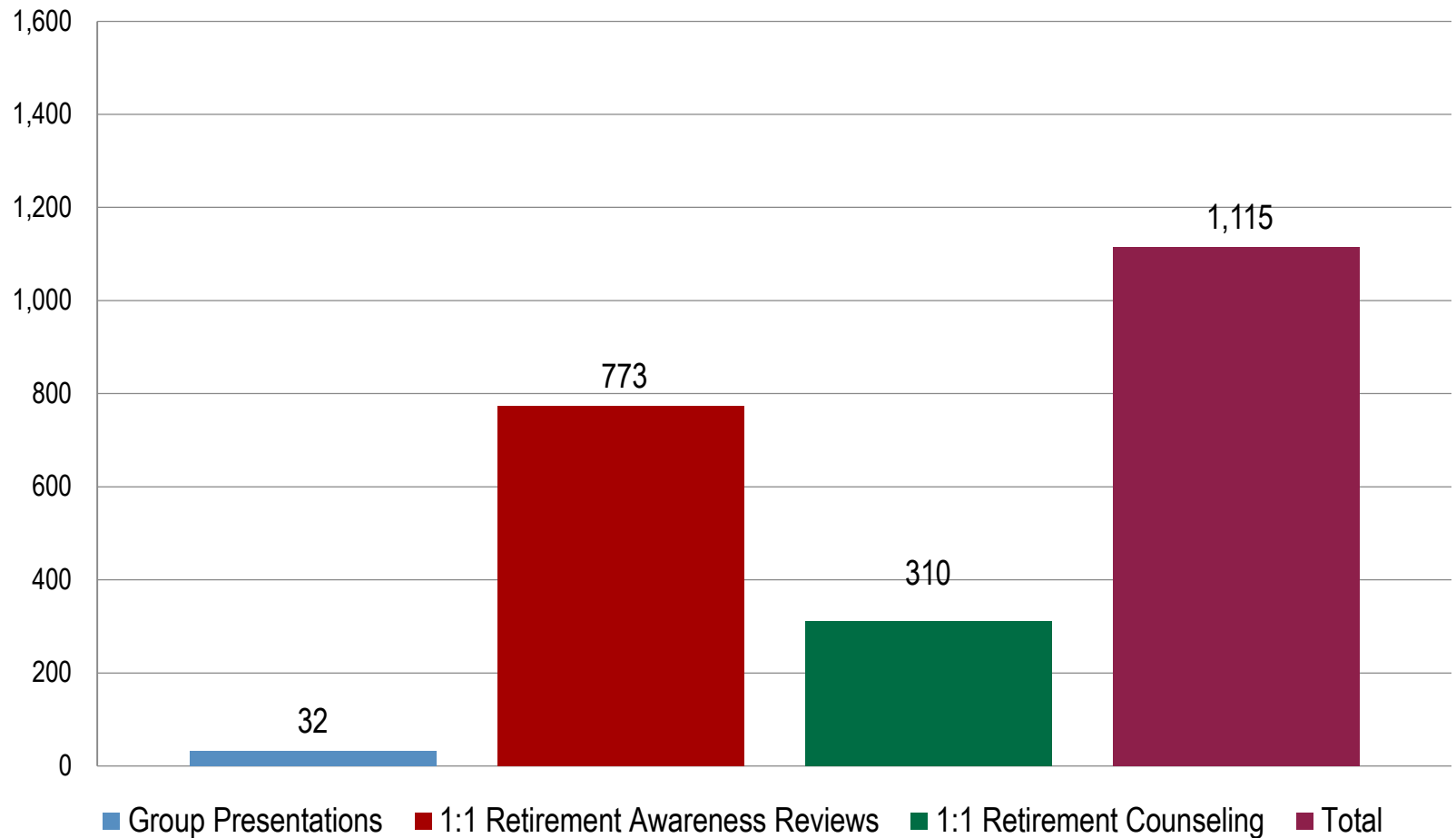
**Rollovers out by vendor as of 09.30.2020
(\$27,540,724.67)**



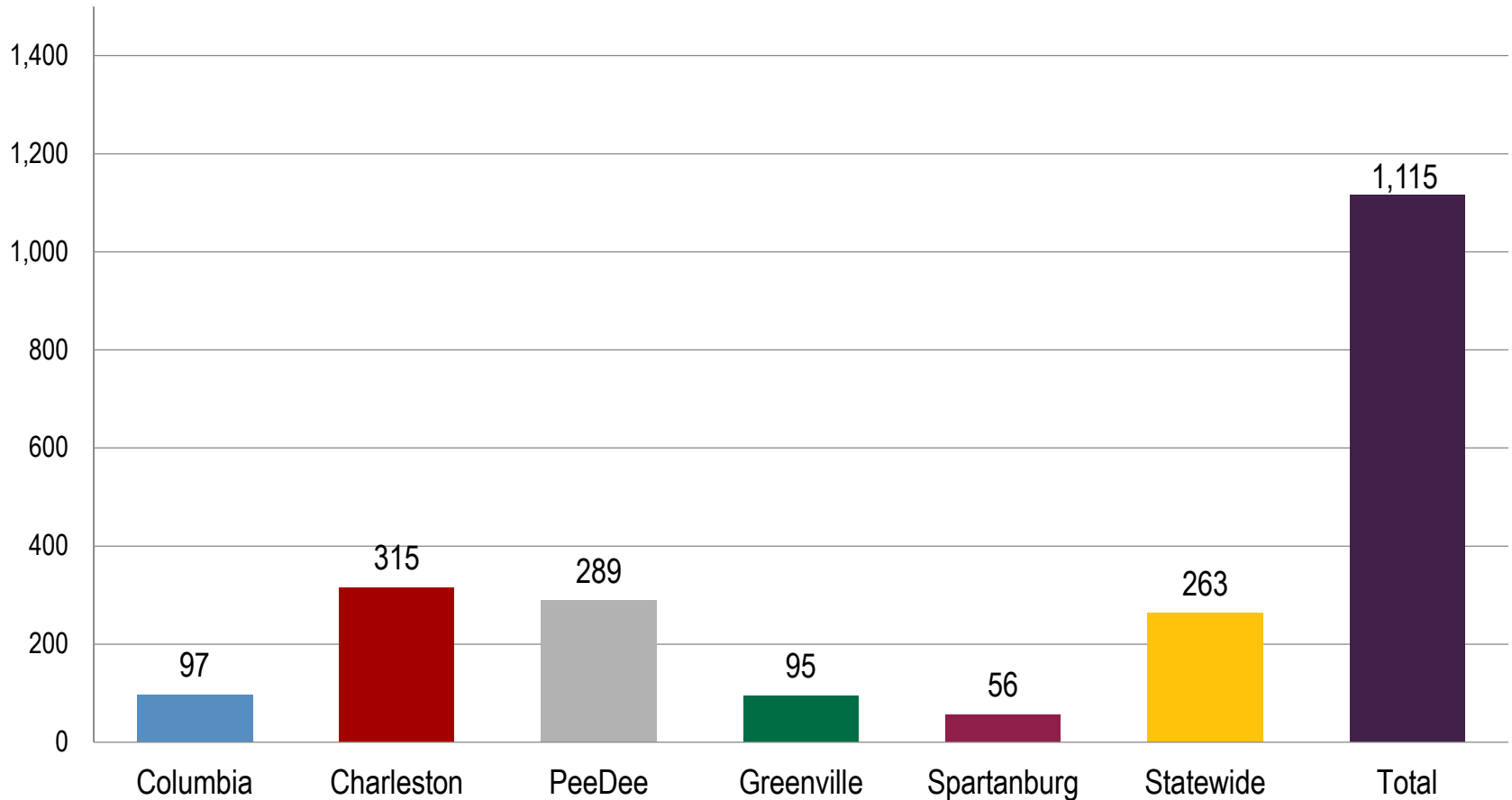
Participant Education



Retirement Plan Advisor (RPA) Activity - Third Quarter 2020



RPA Activity by Region - Third Quarter 2020



RPA Surveys*

How many years do you have until retirement?

Less than 10 years	50%
10-20 years	14%
20+ years	11%
Already retired	25%

Did you take action during your meeting with your RPA?

Yes	75%
No	25%

How would you rate your RPA's ability to adequately answer your questions and share relevant knowledge with you?

Excellent	69%
Highly effective	19%
Effective	10%
Somewhat effective	0%
Not effective	2%

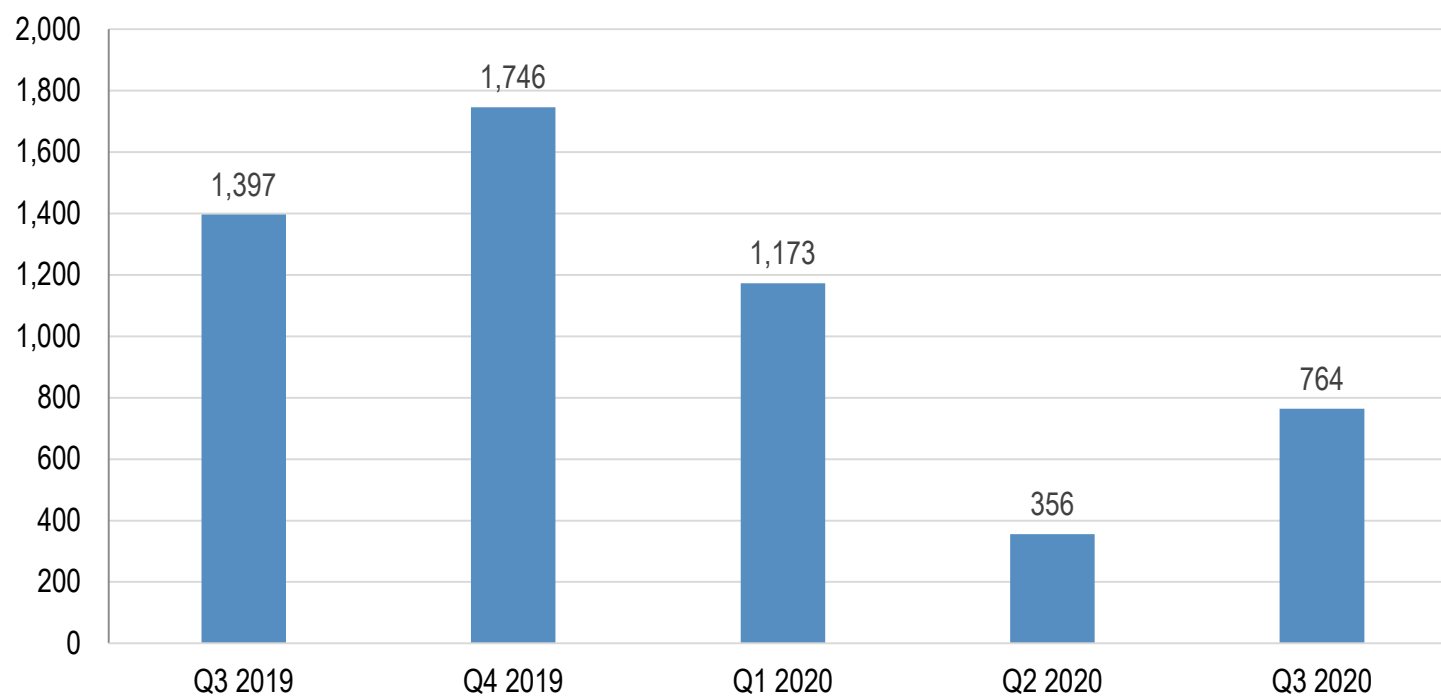
On a scale of 1-10, how likely are you to refer a colleague to your RPA?

8-10	97%
5-7	2%
1-4	1%

*98 respondents between 7.01.2020 and 9.30.2020.

New Enrollments*

	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020
Total	1,397	1,746	1,173	356	764



*Across all sources

Asset Allocation Tool Usage

	As of 06.30.2020	As of 09.30.2020	Change from previous quarter
401(k) Plan			
100% invested in one Target Date	6,474	6,577	+103
My Total Retirement Users	18,592	18,788	+196
457 Plan			
100% invested in one Target Date	2,877	2,939	+62
My Total Retirement Users	5,807	5,824	+17

Participant Engagement



Email capture campaign

Dates: September - October

Audience:

- All eligible employees who do not have an email on file, or have only a work email on file

Reach:

- Email: 54,018 delivered
 - Open rate: 39.9 percent
 - Click rate: 12.6 percent
- Mailer: 23,601

Results:

- Currently measuring



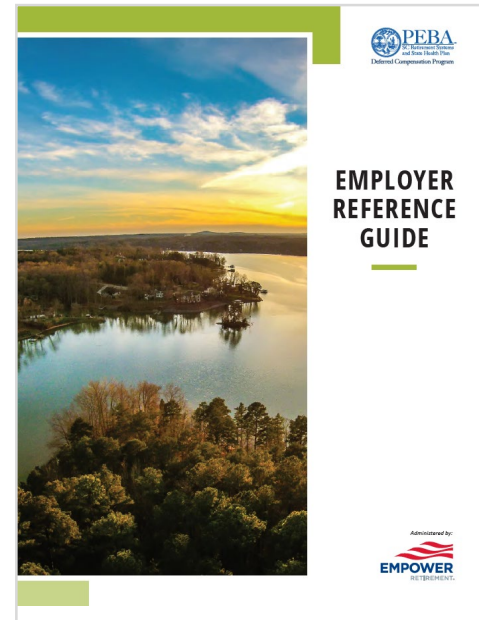
Email



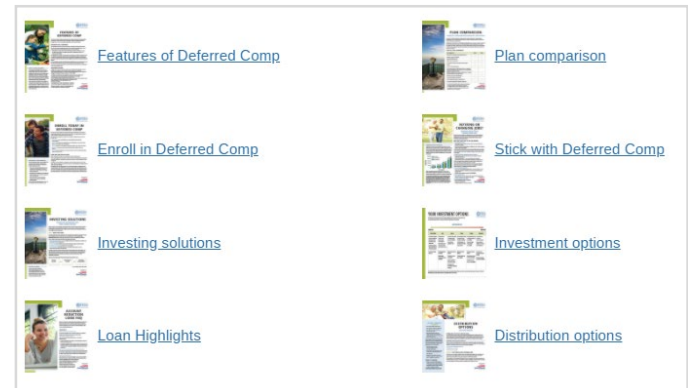
Mailer front

Other deliverables

- New Deferred Comp branding completed
- *Employer reference guide* rebranded
- *Running a termination date* report flier rebranded
- All thumbnails on *Program resources* page updated
- Updated content on *Approaching retirement* webpage with TimeTap and group meeting links
- Updated *Investment information* webpage with 4Q Stable Value Fund interest rate



Rebranded employer reference guide



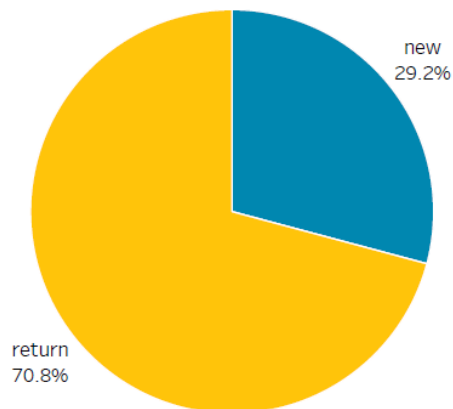
Updated website flier thumbnails

Website and Call Center statistics

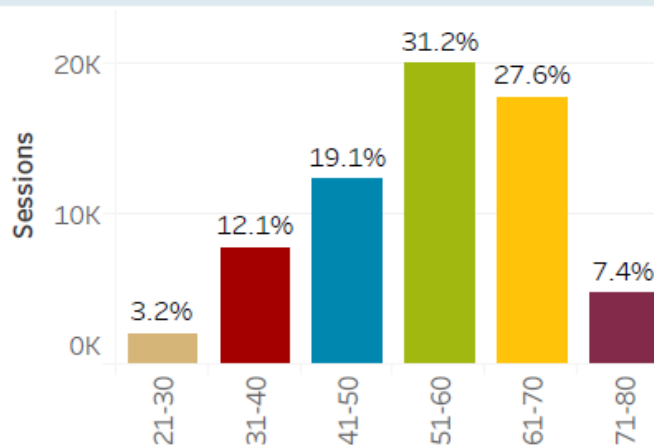


Website statistics Third Quarter 2020

User Type (Sessions)



Age Bracket (Sessions)



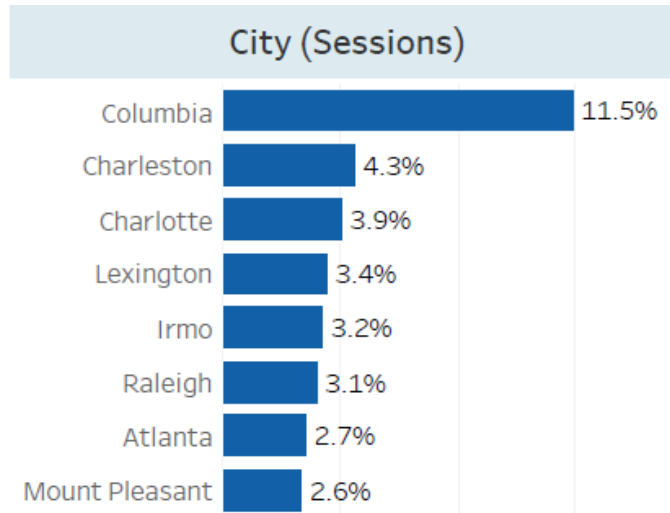
Overall Performance

Unique Users	48,492
Sessions	136,612
Pageviews	850,836
Pages/Session	6.23
Users who logged In	20,303
Avg. Session Duration	00:06:02
Sessions Per User	2.82
Bounce Rate	10.68%

Change from 2Q2020

- Unique users: 49,234 decrease of 1.5 percent
- Sessions: 128,813 increase of 6.1 percent
- Users who logged in: 19,262, increase of 5.4 percent
- Approximately 4.1 percent increase from 3Q2019 numbers

Website statistics Third Quarter 2020



Top 3 pre-login pages

- Program resources: 1,275 views
- About Deferred Comp: 1,086 views
- Employer pre-landing page: 1,055 views

Gender by session

- Male: 57.2 percent
- Female: 42.8 percent

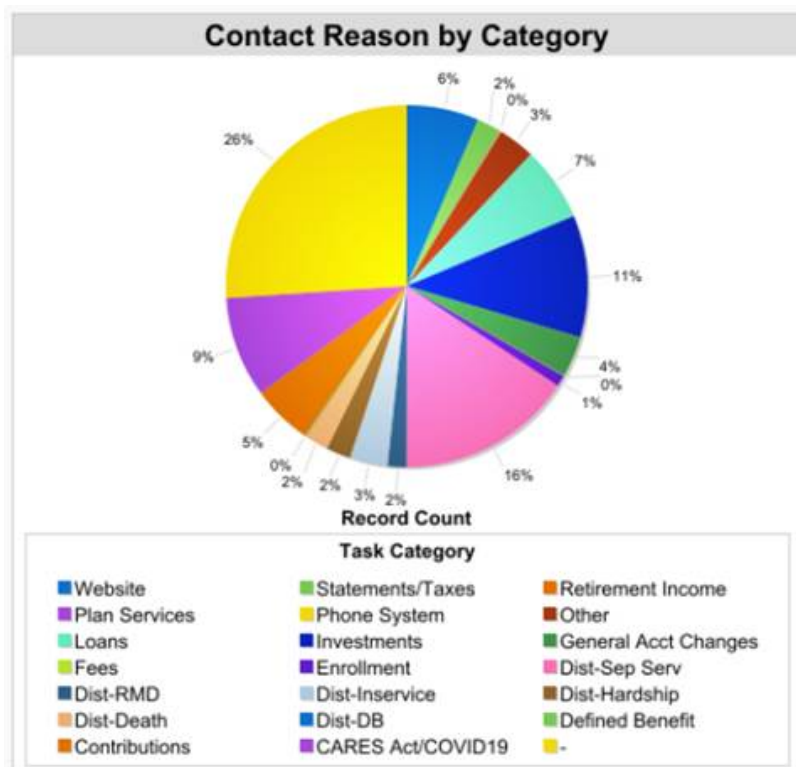
Top 3 post-login pages

- Account details: 74,823 views
- Account overview: 35,051 views
- Investment overview: 11,468 views

Devices per session

- Desktop: 72.2 percent
- Mobile: 23.6 percent
- Tablet: 4.2 percent

Call Center statistics - Third Quarter 2020



			Created Date			Grand Total
	Task Category		July 2020	August 2020	September 2020	
<input type="checkbox"/>	Website	Record Count	266	217	209	692
<input type="checkbox"/>	Statements/Taxes	Record Count	124	62	37	223
<input type="checkbox"/>	Retirement Income	Record Count	1	0	0	1
<input type="checkbox"/>	Plan Services	Record Count	1	4	3	8
<input type="checkbox"/>	Phone System	Record Count	3	2	6	11
<input type="checkbox"/>	Other	Record Count	128	107	118	353
<input type="checkbox"/>	Loans	Record Count	223	263	225	711
<input type="checkbox"/>	Investments	Record Count	473	375	318	1,166
<input type="checkbox"/>	General Acct Changes	Record Count	165	104	123	392
<input type="checkbox"/>	Fees	Record Count	0	3	3	6
<input type="checkbox"/>	Enrollment	Record Count	30	36	41	107
<input type="checkbox"/>	Dist-Sep Serv	Record Count	612	558	515	1,685
<input type="checkbox"/>	Dist-RMD	Record Count	99	45	36	180
<input type="checkbox"/>	Dist-Inservice	Record Count	141	125	96	362
<input type="checkbox"/>	Dist-Hardship	Record Count	89	87	58	234
<input type="checkbox"/>	Dist-Death	Record Count	84	73	66	223
<input type="checkbox"/>	Dist-DB	Record Count	0	0	1	1
<input type="checkbox"/>	Defined Benefit	Record Count	2	8	5	15
<input type="checkbox"/>	Contributions	Record Count	194	213	174	581
<input type="checkbox"/>	CARES Act/COVID19	Record Count	396	291	277	964
<input type="checkbox"/>	-	Record Count	959	934	895	2,788
Grand Total		Record Count	3,990	3,507	3,206	10,703

Call Center statistics - Third Quarter 2020

Volume

Total Contacts: 10,703

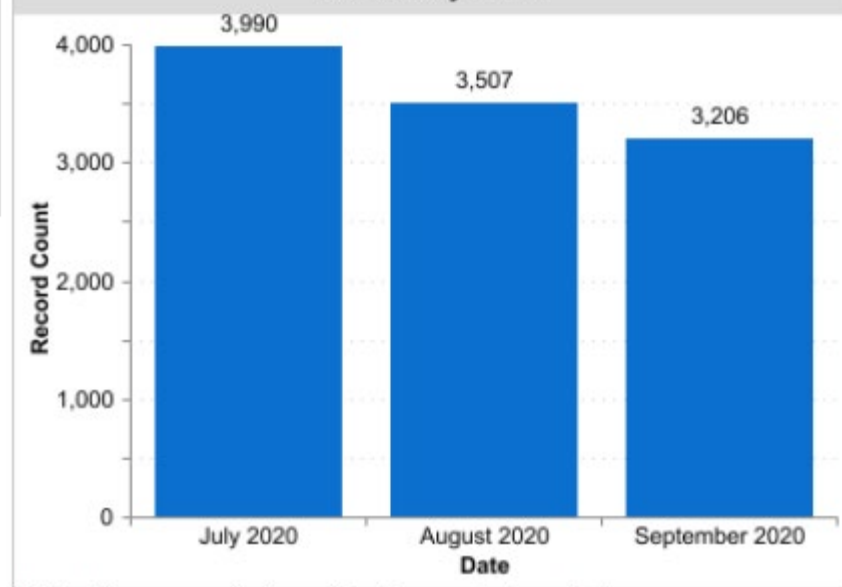
Contacts by Plan

Plan	Record Count
State of South Carolina Salary Deferral 401(k) Plan and Trust::98955-01	9,166
State of South Carolina 457 Deferred Compensation Plan and Trust::98955-02	1,537

Top 10 Reasons

Task Reason	Record Count
Sep Serv Eligibility/Request	874
Account Balance	719
Trouble Logging In – Existing User	475
Withdrawal – Inquiry/form request	412
Sep Serv Status	333
Sep Serv Initiation by Agent	298
Personal Info Change	259
Inservice Eligibility/Request	232
Deferral Change	230
Loan Eligibility/Request	227

Contacts by Month



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