South Carolina Public Employee Benefit Authority
South Carolina Retirement Systems

2020 Actuarial Experience Study
for the Period Ending June 30, 2019

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December 2, 2020

Public Employee Benefit Authority
South Carolina Retirement Systems
P.O. Box 11960
Columbia, SC 26211-1960

Dear Members of the Board:

Subject: Results of 2020 Experience Study

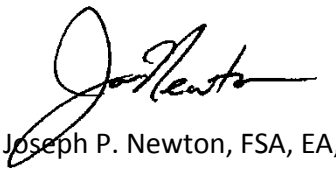
We are pleased to present our report of the 2020 Experience Investigation Study for the South Carolina Retirement Systems (i.e. South Carolina Retirement System, Police Officers Retirement System, Judges and Solicitors Retirement System, General Assembly Retirement System, and the South Carolina National Guard Supplemental Retirement Plan). Our report includes a discussion of the recent experience of the System, it presents our recommendations for updated actuarial assumptions and methods, and it provides information about the actuarial impact of these recommendations on the liabilities, contribution requirements, and the projected funding period.

The scheduled employer contribution rates for SCRS and PORS in effect as a result of the enactment of the 2017 pension reform legislation are projected to remain sufficient under both the current and recommended assumptions. The use of the recommended set of actuarial assumptions should present a more accurate portrayal of the Systems' financial condition and projected funding period. The recommended assumptions should also reduce the magnitude of future experience gains and losses.

In performing this study, we reviewed the System's actual demographic for the using a five-year period ending June 30, 2019 (a couple assumptions were based on additional years of experience). The review of the investment return assumption incorporates the 2020 forward-looking return expectations of the investment consultant for the Retirement System Investment Commission. This experience investigation study was conducted in accordance with generally accepted actuarial principles and practices, and in full compliance with the Actuarial Standards of Practice as issued by the Actuarial Standards Board. All of the undersigned are members of and meet the Qualification Standards of the American Academy of Actuaries.

We wish to thank the PEBA staff for their assistance in this project.

Sincerely,



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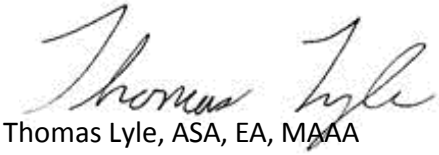

Thomas Lyle, ASA, EA, MAAA
Actuary

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Summary of Process

A periodic review and selection of the actuarial assumptions is one of many important components of understanding and managing the financial aspects of the South Carolina Retirement Systems. Use of outdated or inappropriate assumptions can result in understated costs which will lead to higher future contribution requirements or perhaps an inability to pay benefits when due; or, on the other hand, produce overstated costs which place an unnecessarily large burden on the current generation of members, employers, and taxpayers.

A single set of assumptions is typically not expected to be suitable forever. As the actual experience of the retirement changes, the assumptions should be reviewed and adjusted accordingly.

It is important to recognize that the impact from various outcomes and the ability to adjust from experience deviating from the assumption are not symmetric. Due to compounding economic forces, legal limitations, and moral obligations outcomes from underestimating future liabilities are much more difficult to manage than outcomes of overestimates, and that un-symmetric risk should be considered when the assumption set, investment policy and funding policy are created. As such, the assumption set used in the valuation process needs to represent the best estimate of the future experience of the System and be at least as likely, if not more than likely, to overestimate the future liabilities versus underestimate them.

Changes in certain assumptions and methods are suggested upon this comparison to remove any bias that may exist and to perhaps add in a slight margin for future adverse experience where appropriate. Next, the assumption set as a whole was analyzed for consistency and to ensure that the projection of liabilities was reasonable and consistent with historical trends.

The following report provides our recommended changes to the current actuarial assumptions. With the exception of the investment return assumption, the Board will adopt a new set of demographic and economic assumptions that will be used in the July 1, 2020 actuarial valuation. The investment return assumption is a prescribed assumption set by another party in Section 9-16-335 of South Carolina State Code. The current 7.25% return assumption expires on July 1, 2021 and the Board is to submit a proposed return assumption to the Senate Finance Committee and the House Ways and Means Committee before January 1, 2020 for the General Assembly to consider when amending the Statute.

SECTION I

INTRODUCTION

Introduction

In determining liabilities, contribution rates and funding periods for retirement plans, actuaries must make assumptions about the future. Among the assumptions that must be made are:

- Investment return rate
- Salary increase rates
- Payroll growth
- Inflation rate
- Mortality rates
- Retirement rates
- Termination rates
- Disability rates

For some of these assumptions, such as the mortality rates, past experience provides important evidence about the future. For other assumptions, such as the investment return rate, the link between past and future results is much weaker. In either case, though, actuaries should review their assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

In conducting experience studies, actuaries generally use data over a period of several years. This is necessary in order to gather enough data so that the results are statistically significant. In addition, if the study period is too short, the impact of the current economic conditions may lead to misleading results. It is known, for example, that the health of the general economy can impact salary increase rates and termination rates. Using results gathered during a short-term boom or bust will not be representative of the long-term trends in these assumptions. Also, the adoption of legislation, plan improvements or changes in salary schedules will sometimes cause a short-term distortion in the experience. For example, if an early retirement window was opened during the study period, we would usually see a short-term spike in the number of retirements. Using a longer period prevents giving too much weight to such short-term effects. On the other hand, using a much longer period increases the difficulty of identifying changes in behavior that may be occurring, such as mortality improvement or a change in the ages at which members retire. In our view, using a five-year period ending June 30, 2019 is generally reasonable. However, for certain assumptions, the experience over a ten-year period will be used.

In an experience study, we first determine the number of deaths, retirements, etc. that occurred during the period. Then we determine the number expected to occur, based on the current actuarial assumptions. The number “expected” is determined by multiplying the probability of the occurrence at the given age, by the “exposures” at that same age. For example, let’s assume there is a rate of retirement of 15% at age 55. The number of exposures can only be those members who are age 55 and eligible for retirement at that time. Thus they are considered “exposed” to that assumption. Finally, we calculate the A/E ratio, where "A" is the actual number (of retirements, for example) and "E" is the expected number. If the current assumptions were "perfect", the A/E ratio would be 100%. When it varies much from this figure, it is a sign that a new assumption may be needed. (However, in some cases we prefer to set our assumptions to produce an A/E ratio a little above or below 100%, in order to introduce some conservatism.) Of course we not only look at the assumptions as a whole, but we also review how well they fit the actual results by gender, by age, and by service.

Finally, if the data leads the actuary to conclude that new tables are needed, the actuary "graduates" or smooths the results since the raw results can be quite uneven from age to age or from service year to service year.

Please bear in mind that, while the recommended assumption set represents our best estimate, there are other reasonable assumption sets that could be supported. Some reasonable assumption sets would show higher or lower liabilities or costs.

Organization of Report

Section II of this report summarizes our recommended changes. Section III contains our findings and a more detailed analysis of our recommendation for each actuarial assumption. The impact of adopting our recommendations on liabilities and contribution rates is shown in Section IV. Sections V through IX show a summary of the recommended assumptions for each System. Finally, Section X presents detailed summaries of the data and comparisons of the A/E ratios.

Plans

This study pertains to the following plans:

- South Carolina Retirement System (SCRS)
- Police Officers Retirement System (PORS)
- Judges and Solicitors Retirement System (JSRS)
- General Assembly Retirement System (GARS)
- South Carolina National Guard Supplemental Retirement Plan (SCNG)

Throughout the report, we will refer to each individual plan by SCRS, PORS, JSRS, GARS, and SCNG. We will use the term “System” to refer to all of the plans.

Section X Exhibits

The exhibits in Section X should generally be self-explanatory. For example, on page 120, we show the exhibit analyzing the police service-based termination rates. The second column shows the total number of members who terminated during the study period. This excludes members who died, became disabled or retired. Column (3) shows the total exposures. This is the number of members who could have terminated during any of the years. In this exhibit, the exposures exclude anyone eligible for retirement. A member is counted in each year they could have terminated, so the total shown is the total exposures for the study period. Column (4) shows the probability of termination based on the raw data. That is, it is the result of dividing the actual number of terminations (col. 2) by the number exposed (col. 3). Column (5) shows the current termination rate and column (6) shows the new recommended termination rate. Columns (7) and (8) show the expected numbers of terminations based on the current and proposed termination assumptions. Columns (9) and (10) show the Actual-to-Expected ratios under the current and proposed termination assumptions.

SECTION II

SUMMARY OF RECOMMENDATIONS

Summary of Recommendations SCRS and PORS

Our recommendations to the actuarial assumptions used the actuarial valuation for SCRS and PORS may be summarized as follows:

Economic Assumptions

1. Inflation Assumption: Recommend no change to the 2.25% price inflation assumption. This assumption is not directly used in the projection of future benefits or the calculation of the actuarial accrued liability, but is used as a building block in the other economic assumptions used in the actuarial valuation.

2. Investment Return Assumption: This is a prescribed assumption under Section 9-16-335 of the South Carolina State Code. Based on the 2020 capital market assumptions from the Investment Commission's investment consultant, Meketa Investment Group, the median expected geometric returns over a 10-year and 20-year time horizon is approximately 6.57% and 7.44%, respectively. While this data does support the current 7.25% as a reasonable assumption for use in the actuarial valuation, given the difference between the current assumption and the expectations over the short term and the limitations for the General Assembly only reestablishing this assumption only once every four years, we recommend to General Assembly adopt a 7.00% return assumption when the current 7.25% investment return assumption expires on June 30, 2021.

   We also recommend that the General Assembly modify the statute to provide the PEBA Board the authority to establish and maintain the investment return assumption or to have the General Assembly review this assumption on a more frequent basis than every four years.

3. Payroll growth rate: Recommend decreasing the payroll growth rate from 3.00% to 2.70%.

Demographic Assumptions:

4. Salary Increases for Individual Members: Recommend no change to the long-service component of the salary increase assumption. We recommend increasing the salary increase assumption for members with less than three years of service. We also recommend overall decreases in the step-rate of salary increase for public school employees with more than three years of service and increases to the step-rate of salary increases for members in PORS.

5. Mortality: Recommend continued use of a Retirement System specific mortality table for non-disabled retirees in SCRS and PORS, but make updates to incorporate the System's actual experience since the last experience study. We recommend using variations of the Pub-2010 Public Retirement Plans Mortality Tables that were developed by the Society of Actuaries and issued in January 2019 for disabled retirees and active members. We also recommend updating the mortality improvement assumption used to project the future improvement in mortality to 80% of the ultimate rate in increase in the MP-2019 mortality improvement scale.

7. Retirement: Recommend minor increases to the retirement rates for general employees in SCRS and members in PORS. We also recommend increases in the service based retirement assumption for public school employees.

8. Termination/Withdrawal: We recommend some increases in the rates of termination for general employees and female public school employees in SCRS. We recommend no change to the assumption for PORS.

9. Disability Incidence: Recommend decreasing the rates of disability in SCRS and no change to the disability rates for PORS.

Actuarial Methods and Policies

10. Asset Valuation Method: No change to the current asset valuation method.

11. Actuarial Cost Method: No recommended changes. The individual Entry Age Normal cost method (EAN) used to determine the actuarial accrued liability is by far the most commonly used actuarial cost method for large public retirement systems and is the most appropriate funding method.

12. Funding Policy: The 2017 pension reform legislation significantly increased the sustainability of SCRS and PORS. Similarly, the Board's funding policy adopted in 2019 for JSRS and the increased payroll based contributions and annual appropriations will increase the sustainability of that System. To mitigate volatility in future contribution requirements for GARS and SCNG, we recommend the Board adopt a "layered amortization policy" where actuarial gains and losses recognized each future year are separately amortized over a closed 10-year period.

Summary of Recommendations SCRS and PORS

The following table summarizes our recommendations discussed on the previous pages.

Assumption (1)	Retirement System	
	SCRS (2)	PORS (3)
Economic Assumptions		
1. Inflation	2.25%	2.25%
2. Investment Return	7.00%	7.00%
3. Payroll Growth Rate	2.70%	2.70%
Demographic Assumptions		
4. Salary Increases	Changes to step-rate portion of the assumption	Changes to step-rate portion of the assumption
5. Mortality	Updates to base table and different improvement assumption	Updates to base table and different improvement assumption
6. Termination/Withdrawal	Slight increase	No change
7. Retirement	Slight increase	Slight increase
8. Disability	Decrease	No change
Other Methods and Policies		
9. Liability Cost Method	EAN	EAN
10. Asset Method	No change	No change
11. Funding Policy	Established in statute	Established in statute

Summary of Recommendations JSRS, GARS, and the SCNG

Our recommendations to the actuarial assumptions used in the actuarial valuation for JSRS, GARS, and SCNG may be summarized as follows:

Assumption	Retirement System		
	JSRS	GARS	SCNG
(1)	(2)	(3)	(4)
Economic Assumptions			
1. Inflation	2.25%	2.25%	2.25%
2. Investment Return	7.00%	7.00%	7.00%
3. Payroll Growth Rate	3.00%	N/A	N/A
Demographic Assumptions			
4. Salary Increases	3.00%	N/A	N/A
5. Mortality	Same as public school employees	Same as general employees	Same as PORS
6. Termination/Withdrawal	None	None	Increase
7. Retirement	Slight increase	Increase	No change
8. Disability	Same as public school employees	Same as general employees	None
Other Methods and Policies			
9. Liability Cost Method	EAN	EAN	EAN
10. Asset Method	No change	No change	No change
11. Funding Policy	No change	10-Year layered amortization bases	10-Year layered amortization bases

SECTION III

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

Analysis of Experience and Recommendations

We will begin by discussing the economic assumptions: inflation, expenses, the investment return rate, the salary increase assumption, and the rate of payroll growth. Next are the demographic assumptions: mortality, disability, termination and retirement. Finally, we will discuss all of the actuarial methods used.

ECONOMIC ASSUMPTIONS

Actuaries are guided by the Actuarial Standards of Practice (ASOP) adopted by the Actuarial Standards Board (ASB). One of these standards is ASOP No. 27, Selection of Economic Assumptions for Measuring Pension Obligations. This standard provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans.

As no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The economic assumptions are much more subjective in nature than the demographic assumptions. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

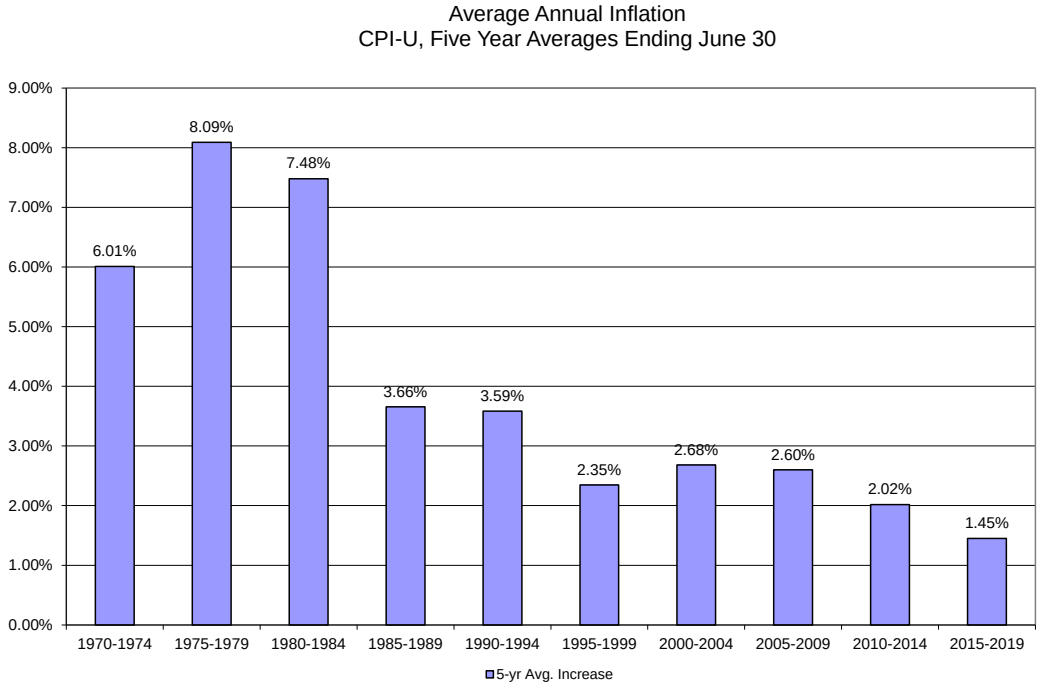
Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period. Nevertheless, the economic assumptions are much more subjective in nature than the demographic assumptions, which in itself can still create a difference in opinion among individuals in the actuarial profession and possibly stakeholders of the Retirement Systems.

Inflation Assumption

By "inflation," we mean price inflation as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies most of the other economic assumptions. It impacts investment return, salary increases, and the rate of payroll growth for amortizing the unfunded actuarial accrued liability. The current annual inflation assumption is 2.25%.

Actual Change in CPI-U

The chart below shows the average annual inflation in each of the ten consecutive five-year periods over the last fifty years:



The following table shows the average inflation over various periods, ending June 30, 2019:

Periods Ending June 30, 2019	Average Annual Increase in CPI-U
Last five (5) years	1.45%
Last ten (10) years	1.73%
Last fifteen (15) years	2.02%
Last twenty (20) years	2.19%
Last twenty-five (25) years	2.22%
Last thirty (30) years	2.44%
Since 1913 (first available year)	3.11%

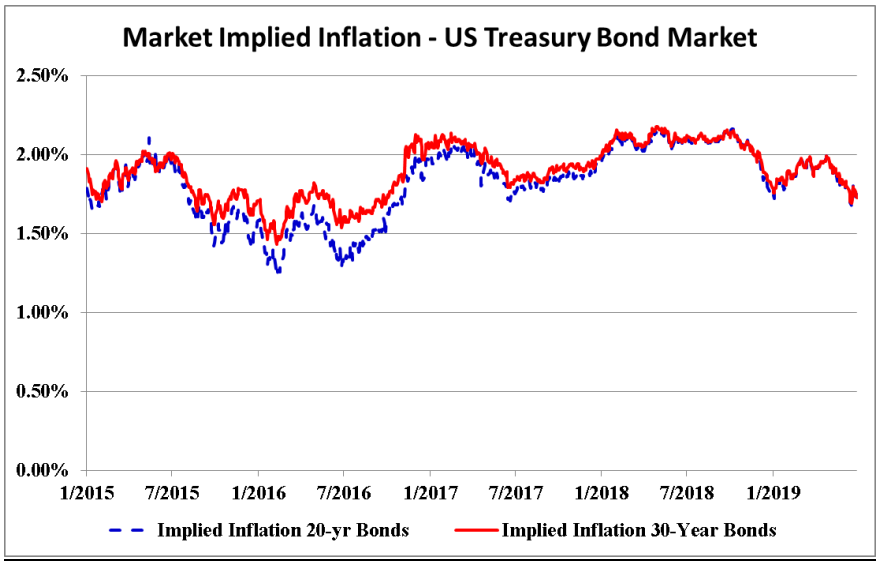
Source: Bureau of Labor Statistics, CPI-W, all items, not seasonally adjusted

Forecasts from Investment Consulting Firms

Investment consulting firms make an assumption regarding future price inflation when developing their forward-looking capital market assumptions. Meketa Investment Group (Meketa), the South Carolina Investment Commission's investment consultant, assumes that inflation will increase at the rate of 2.15% per year over the next ten years and 2.60% over the next 20 years (based on their 2019 capital market assumptions). Each year Horizon Actuarial Services, LLC compiles and averages investment return forecasts of major investment consulting firms and their 2019 survey of 34 investment consulting firms (including Meketa) have an average price inflation assumption of 2.21% over the next 10 years and a 2.29% average inflation assumption over the next 20 to 30 years.

Expectations Implied in the Bond Market

Another source of information about future inflation is the market for US Treasury bonds. For example, the June 30, 2019 yield for 20-year inflation indexed Treasury bonds was 0.55% plus actual inflation. The yield for 20-year non-indexed US Treasury bonds was 2.31%. Simplistically, this means that on that day the bond market was predicting that inflation over the next twenty years would average 1.75% [(1 + 2.31%) / (1 + 0.55%) - 1] per year. The difference in yield for 30 year bonds implies 1.73% inflation over the next 30 years. The following chart shows the historical market implied inflation from January 1, 2015 through June 30, 2019.



However, this analysis is known to be imperfect as it ignores the inflation risk premium that buyers of US Treasury bonds often demand as well as possible differences in liquidity between US Treasury bonds and TIPS.

Forecasts from Social Security Administration

In the Social Security Administration's 2019 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.6% under the intermediate cost assumption. The Chief Actuary for the Social Security Administration kept this assumption change from the prior.

Survey of Professional Forecasters and Fed Policy

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their second quarter 2019 survey found inflation expectations over the next ten years (2019 to 2028) to average 2.20%. This average expectation remains unchanged from their survey in the first quarter of 2019. Additionally, the Fed has openly stated that they have a target 2.00% inflation rate.

Comparison of Inflation Expectations from 2015 to 2019

Finally, the table below provides a comparison of the inflation expectations documented in the 2015 experience study report and the current inflation expectations.

	Inflation Expectations		
Source	**2015**	**2019**	**Change**
(1)	(2)	(3)	(4)
Investment Consultant Survey 20-30 Year[1]	2.30%	2.29%	-0.01%
Implied Inflation 20-Year Treasuries	1.96%	1.75%	-0.21%
SSA Trustees Report	2.70%	2.60%	-0.10%
Survey of Professional Forecasters	2.15%	2.20%	0.05%

[1] Horizon's Survey of Capital Market Assumptions 2015 and 2019 Edition.

Recommendation

Given the current forward-looking inflation expectations and the relative constancy since the last experience study, we are not recommending any change to the current 2.25% price inflation assumption.

Investment Return Assumption

The investment return assumption is one of the principal (and most subjective) assumptions used in any actuarial valuation of a retirement plan. It is used to discount future expected benefit payments to the valuation date in order to determine the liabilities of the plans. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates. The current assumption is 7.25% and is a prescribed assumption set by an outside party in Section 9-16-335 of the South Carolina State Code. The current assumption will expire on June 30, 2021 and the General Assembly must enact a new investment return assumption for use in the July 1, 2021 actuarial valuation.

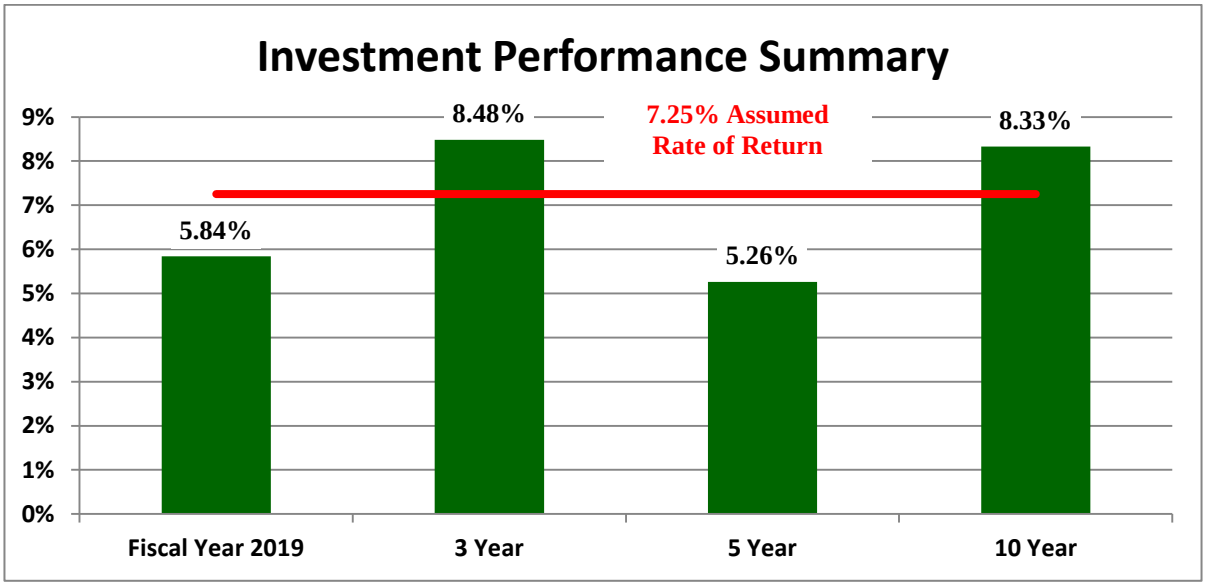
Investment and Administrative Expenses

The trust fund pays expenses in addition to member benefits and refunds, so we must make some assumption about these. It is industry practice that the investment return assumption represents expected return after payment of investment expenses. In regards to investment expenses, anticipated returns developed by investment consulting firms and discussed in more detail later in this section are net of investment related fees (including alternative asset classes such as real estate, private equity, and hedge funds). Therefore, we will not make any adjustments to account for investment related expenses.

On the other hand, the actuarial valuation for each system includes an explicit administrative expense assumption as percentage of payroll that is included in the normal cost rate. Based on the average of plan administrative expenses reported in the 2017, 2018, and 2019 CAFRs, we are recommending the administrative expense assumption (as a percentage of payroll) to increase from 12 basis points to 18 basis points. For the SCNG we recommend continued use of a $15 thousand administrative expense assumption that is added to the dollar amount of the normal cost.

Actual Investment Performance

Below is a chart with the actual annualized investment return performance on a market value of asset basis. Plan returns are time-weighted and net of investment expenses.

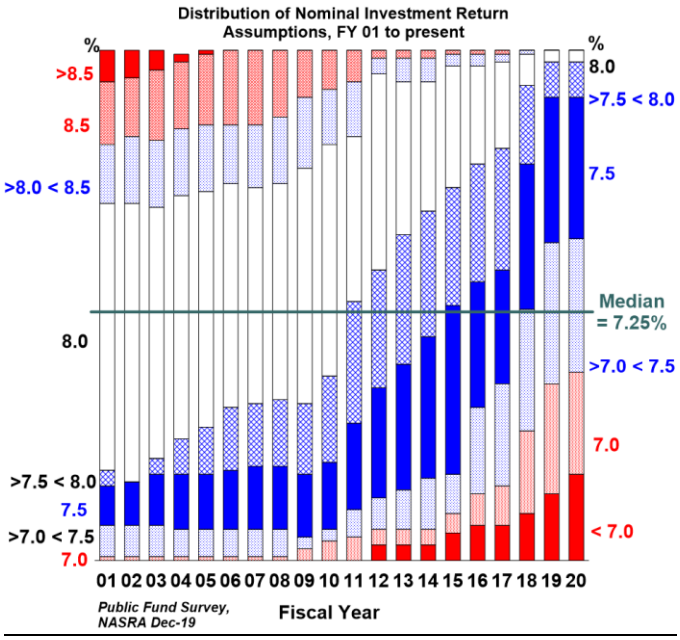


Source: Comprehensive Annualized Financial Report for the fiscal year ending June 30, 2019.

However, past performance is not a reliable indicator of future investment performance, even when returns are averaged over a long time (e.g. twenty year period or more). The actual asset allocation of the trust fund will significantly impact the overall performance, so returns achieved under a different allocation are not meaningful.

Assumption Comparison to Other Retirement Systems

We do not recommend the selection of an investment return assumption based on prevalent information. However, it is still informative to identify where the investment return assumption used in the valuation for SCRS compares to that used by other large retirement systems. The chart on the following page provides the distribution of the investment return assumptions in the National Association of State Retirement Systems Administrator's (NASRA) Survey conducted as of December 31, 2019. As the chart shows, there has been a continual shift in the distribution of return assumptions since 2010. Recently the median investment return assumption decreased from 7.50% in their 2018 survey to 7.25% in NASRA's 2019 survey and the 2020 survey results marks the first year since 2010 that the change in the distribution has slowed and the median return assumption remains unchanged at 7.25%.



Source: NASRA 2020 Investment Survey Results. www.nasra.org

Forecasts Developed by Professional Investment Consultant

We believe an appropriate approach to selecting an investment return assumption is to identify expected returns given the System's asset allocation mapped to forward-looking capital market assumptions. Because GRS is a benefits consulting firm and does not provide investment consulting advice, we do not develop or maintain our own forecasts of capital market expectations. Instead, we utilized the forward-looking return expectations developed by nationally recognized investment consulting firms, including Meketa, which is the RSIC's investment consultant.

Forecasts Based on 2020 Capital Market Assumptions

Below is a summary of the asset allocation for the System that was used in the analysis, which is documented on page 50 of PEBA's 2019 comprehensive annual financial report.

Asset Class	Allocation
Equities	51%
Real Assets	12%
Credit Securities	15%
Rate Sensitive Credit	14%
Opportunistic[1]	8%
Total	**100%**

[1] Excludes exposure to Portable Alpha Hedge Funds in support of an Overlay program, which currently implemented with a gross 10% asset allocation.

Where available, investments in these asset classes were split into subgroups to refine the analysis when identifiable. For example, Real Assets were appropriately allocated into publicly traded Real Estate Investment Trusts (REITs) and Private Real Estate sub-asset classes.

Meketa develops two sets of capital market assumptions, a "short-term" based on a 10-year investment horizon and a "long-term" based on a 20-year investment horizon, and the table below provides the expected forward-looking return (geometric) over each time period.

Expected Geometric Return Statistics based on Meketa Investment Group's 2020 Capital Market Expectations

Item	Short-Term (10-Year)	Long-Term (20-Year)
(1)	(2)	(3)
Expected Nominal Compound Return	6.57%	7.44%

Note: Return expectation includes 0.25% for portable alpha Overlay.

The expected return for the System based on Meketa's assumptions is approximately 90 basis points higher over the next 20 years compared to the next 10 years. It's our understanding that Meketa develops the 20-year forecasts by a mean-reversion confidence model that blends the 10 year expectations with average historical returns for each asset class. For comparison, the same values based on Meketa's 2019 capital market expectations were 7.34% over the 10-year period and 8.04% over a 20-year time period, thus there has been significant decrease in these expectations over the past 12 months.

Comparison of Meketa's Return Expectations to Other Investment Consultants

The following tables compares Meketa's return expectations to four other nationally recognized investment consulting firms that produce short-term and longer-term return expectation assumptions (Aon, Cambridge, Mercer Consulting, and New England Pension Consultants). At the time this analysis was prepared the 2020 expectations for the other investment consultant firms were unavailable. Therefore for consistency purposes, we have compared Meketa's return expectations to the return expectations developed by these other firms based on all firms' 2019 capital market assumptions.

Investment Consultant	Median Geometric Expectation (50% percentile) Short-Term (10-Year)	Long-Term (20-Year)
(1)	(2)	(3)
Meketa	**7.34%**	**8.04%**
1	7.31%	7.49%
2	6.29%	7.70%
3	7.26%	7.68%
4	7.21%	7.84%
Average	**7.08%**	**7.75%**

Note: Return expectation includes 0.25% for portable alpha Overlay.

We believe this comparison of Meketa's estimates to other recognized consulting firms shows Meketa's estimates are slightly higher, but well within the range of the other data sources. Also, it is not uncommon for the System's specific investment consultant to be slightly higher than the survey as the investment consultant for a specific system will have more detailed insight on the actual investments inside each category, while the more global assumptions from the other firms are more generic in nature.

Recommendation

The following is an excerpt from ASOP 27 on the topic of using experts:

> **Section 3.5.6 Views of Experts** – *Economic data and analyses are available from a variety of sources, including representatives of the plan sponsor and administrator, investment advisors, economists, and other professionals. When the actuary is responsible for selecting or giving advice on selecting economic assumptions within the scope of this standard, the actuary may incorporate the views of experts but the selection or advice should reflect the actuary's professional judgement.*

In our professional judgement, it is appropriate to rely on the Investment Commission's (and their investment consultant's) input as part of our consideration in making a recommendation as they are the experts and have specialized knowledge in this subject matter. This is the same data being used for investment decision making, and thus is a reasonable set of data for use in decisions on funding as well. Based on this information we have concluded the 7.25% return assumption currently meets the requirements under ASOP 27 for being a reasonable assumption.

However, given Meketa's short-term expectations indicate the return expectations in the next 10 years are materially lower than the current investment return assumption and that the new assumption that will be adopted in the 2021 legislative session becomes effectively locked-in for the actuarial valuations performed in years 2021 through 2025, we recommend the investment return assumption be decreased to 7.00% when the current investment return assumption expires on June 30, 2021. It is also important to note to stakeholders that the contribution rates established in Statute for SCRS and PORS are currently higher than the amount needed to meet the maximum permitted funding period in Statute. This reality provides a margin that the scheduled contribution rates will not have to be increased in the event there is some future investment and/or demographic experience is less favorable than currently assumed. In effect, this policy is already funding as if future returns are lower than the current 7.25% return assumption.

Process Recommendation

Currently the return assumption is assessed and reset once every four years. Given the possibility that future global economic conditions may change the expectations on investment returns in a future year, we believe it is important from a fiduciary standpoint to have a process in place to examine the investment return assumption more frequently than every four years. Therefore, we recommend to the General Assembly that the Statutes be changed to provide the PEBA Board the authority to establish and maintain the investment return assumption or at least the General Assembly review this assumption on a more frequent basis, such as every other year.

Salary Increase Rates

In order to project future benefits, the actuary must project future salary increases. Salaries may increase for a variety of reasons:

- Across-the-board increases for all employees;
- Across-the-board increases for a given group of employees;
- Increases to a minimum salary schedule;
- Additional pay for additional duties;
- Step or service-related increases;
- Increases for acquisition of advanced degrees or specialized training;
- Promotions; or
- Merit increases, if available.

Our salary increase assumption is meant to reflect all of these types of increases, since all of these affect the salaries used in benefit calculations and upon which contributions are made.

An actuary should not look at the overall increases in total payroll when setting this assumption, because total payroll can increase at a rate different from the average pay increase for individual members. There are two reasons for this. First, when older, longer-service employees terminate, retire or die, they are generally replaced with new employees who have a lower salary. This causes the growth in total payroll to be smaller than the average pay increase for individual employees. Second, total payroll can change due to an increase or decrease in the size of the employee group. Rather we examine the actual compensation increases on an individual basis.

We analyzed the salary increases based on the change in each member's reported pay from one year to the next. That is, we looked at each member who appeared as an active member in two consecutive valuations—these are called continuing active members—and measured his/her salary increase.

Salary increases for governmental employees can also vary significantly from year to year. When the employer's tax revenues stall or increase slowly, salary increases are often small or nonexistent. Salary increases can be larger following economic expansions and contract discussions with employee associations that may result in a fairly material one-time "catch-up" salary increase. Therefore, for this assumption in particular, we prefer to use data over a longer period in establishing our assumptions and used a ten-year period to analyze this assumption.

Below is a table showing the average increase experienced by continuing members by year for members in various groups:

Fiscal Year Ending	State and Local Gov Employees	Public School Employees	PORS
2010	1.8%	3.0%	1.5%
2011	1.5%	0.7%	2.7%
2012	3.2%	2.4%	2.2%
2013	3.7%	5.2%	5.2%
2014	3.2%	3.9%	5.3%
2015	5.1%	3.9%	5.9%
2016	4.9%	4.6%	6.4%
2017	6.5%	5.1%	8.1%
2018	3.9%	4.0%	5.8%
2019	4.8%	5.2%	6.5%
Average	3.9%	3.8%	4.9%

It is typical to assume larger pay increases for younger or shorter-service employees as promotions and productivity increases tend to be greater in the first few years of a career, even if the new employee is older than the average new hire.

The current assumptions follow this pattern for all employee groups. Therefore, we divide the task of setting the salary increase into two pieces:

1. Determining the assumption for long-service employees

2. Determining the additional increases to be applied to shorter-service employees

The next two subsections will discuss these components of the salary assumption.

Salary increase assumptions for long-service employees – SCRS and PORS

Many of the sources of pay increases have diminished importance for longer-service employees. Step or service-related increases are usually smaller and promotions occur with less frequency. Additional training or acquisition of advanced degrees usually occurs early in the career. Thus, our salary increase assumption has an ultimate level when members are assumed to receive increases equal to wage inflation plus smaller increases for merit, promotion, and longevity.

When we examine the experience for long-service members (i.e. members with more than 20 years of service), we find that over the last ten years, their increases have averaged as follows:

Employee Group	Average Salary Increase	Price Inflation (CPI-U)	Difference
State and Local Gov Employees	2.7%	1.7%	1.0%
Public School Employees	2.2%	1.7%	0.4%
PORS	3.2%	1.7%	1.5%

We are proposing no change in the current 0.75% assumed rate salary increases in excess of inflation for long-service employees (State, Local Gov, and Public School) in SCRS. Combined with the recommended 2.25% price inflation assumption, the salary increase assumption for employees with 20 or more years of service is 3.00%. Similarly, we are also proposing no changes in the 1.25% assumed rate salary increases in excess of inflation for members in PORS. This will result in a 3.50% assumed annual rate of salary increase for long-service members in PORS.

Salary increase assumptions for shorter-service employees – SCRS and PORS

To analyze the service-related salary assumption, we looked at the excess in the average increases for shorter service employees over the average for longer-service employees. For example, public school employees with five years of service received an average increase of 4.42%, which was 1.87% more than the average increase of 2.55% for the same type of employee with more than twenty years of service. This component of the salary scale assumption behaves more like a demographic assumption than an economic assumption, and therefore, the historical experience has a high level of creditability for purposes of establishing future expectations.

The annual salary increase assumption was increased for all three membership groups for members with one or two years of service. Adjustments to these step-rate assumptions for state and local government employees with more than two years of service were relatively minor. We are recommending an overall decrease in the assumed salary increases for public school employees with over two years of service and an overall increase for PORS members.

Details of our analysis are shown in Section X beginning on pages 87-89.

Salary Increases – Combined Effect – SCRS and PORS

The table below shows the average expected increase in compensation for continuing members for the last ten years, reconciling the changes from the current to proposed assumptions:

Group	Actual Increase	Actual Inflation	Salary Increase over Inflation		
			Current Assumption[1]	Actual[2]	Proposed Assumption[1]
General Employees	3.9%	1.7%	1.8%	2.2%	1.9%
Public School Employees	3.8%	1.7%	2.3%	2.1%	2.1%
PORS	4.9%	1.7%	2.4%	3.2%	2.7%

[1] The expected average increase in salary in excess of the 2.25% assumed rate of inflation.
[2] The actual salary increase in excess of inflation for all continuing active members during the 10-year observation period.

The increase to the rate of salary increases for members with less than four years of service had the largest effect on the change in the salary assumed increases. However, members with less than four years of service do not have much actuarial accrued liability, so the impact on the actuarial accrued liability will not be significant.

Salary Increases – JSRS

All members in the retirement system for judges and solicitors receive the same percentage increase in salary. The judicial retirement system provides retirees and surviving spouses a cost of living adjustment equal to the percentage increase in the compensation provided to the position they retired. For example, a 3.0% salary increase to active members will result in a 3.0% increase in the retirement allowance for the retirees. Therefore, the salary increase assumption will also be used to model the assumed rate of future cost of living increases for retirees. Below is a table with the historical salary increases received by these members.

FY Beginning July 1,	Salary Increase		FY Beginning July 1,	Salary Increase		FY Beginning July 1,	Salary Increase
2005	4.0%		2010	0.0%		2015	0.0%
2006	3.0%		2011	0.0%		2016	3.3%
2007	3.0%		2012	3.0%		2017	0.0%
2008	1.0%		2013	0.0%		2018	0.0%
2009	0.0%		2014	2.0%		2019	35.8%

As the data shows, except for 2019, the actual historical salary increases have been relatively low and in many years nonexistent. Even with the relatively large salary increase in 2019, the average salary increase for the last 15 years was 3.36%.

Judicial salaries and salary increases (if any) are incorporated into annual budgets developed by the Judicial Department and submitted to the General Assembly for approval. Given the recent salary increase it is possible that salaries for members in JSRS will remain unchanged for a few years before the next salary increase is provided. However, the salary increase assumption is a long-term assumption and not intended to model anticipated near term budgets. Therefore, we assume that salary increases will occur discreetly on an annual basis.

The current salary increase assumption is 2.75% and we recommend increasing that assumption to 3.00%, which is comprised of the recommended 2.25% price inflation assumption and 0.75% for merit and productivity. This assumption is also the same as the assumed rate of salary increase for members in SCRS that have more than 20 years of service.

Salary Increases – GARS and SCNG

Due to the design of the retirement plan for GARS and the SCNG, there is no salary increase assumption required.

Payroll Growth Rate

The salary increase rates discussed above are assumptions applied to individuals and are used in projecting future benefits. A separate payroll growth assumption (currently 3.00% annually) is used for determining the annual payment needed to amortize the unfunded actuarial accrued liability. The amortization payments are calculated to be a level percentage of payroll. Therefore, as payroll increases over time, these amortization payments will also increase.

While certain economic shocks can cause short-term volatility in the difference between wage inflation and price inflation, wage inflation almost always exceeds price inflation. This is because wage inflation is, in theory, the result of (a) price inflation, and (b) productivity gains being passed through to wages. For the last 10 years, wage inflation (as measured by the change in NAW) has been about 0.55% a year larger than price inflation for the economy as a whole (2.35% increase in NAW versus a 1.80% increase in CPI-U).

The chart below shows the average annual payroll growth for SCRS, the average annual growth in membership, and net payroll growth not due to membership growth. Contributing payroll and contributing membership includes members earning benefits, members in TERI, working retirees, and members in the State ORP. We believe it is appropriate to include each of these members in the analysis because it encompasses the employers' workforce and the payroll that SCRS receives contributions.

Average Annual Payroll and Membership Increase Rates for SCRS					
Period	Increase in Contributing Payroll	Increase in Contributing Members	Increase in Excess of Membership	Actual Inflation	Payroll Increase in Excess of Actual Inflation and Membership Change
Last 1-Year	2.44%	0.84%	1.60%	1.65%	-0.05%
Last 3-Years	2.62%	0.65%	2.05%	2.05%	-0.08%
Last 5-Years	3.26%	0.95%	1.45%	1.45%	0.86%
Last 10-Years	1.27%	0.35%	0.92%	1.73%	-0.81%

Average Annual Payroll and Membership Increase Rates for PORS					
Period	Contributing Payroll	Increase in Contributing Members	Increase in Excess of Membership	Actual Inflation	Payroll Increase in Excess of Actual Inflation and Membership Change
Last 1-Year	4.50%	0.95%	3.55%	1.65%	1.90%
Last 3-Years	4.26%	0.52%	3.74%	2.05%	1.69%
Last 5-Years	4.38%	0.10%	4.28%	1.45%	2.83%
Last 10-Years	2.19%	0.00%	2.19%	1.73%	0.46%

During the last ten years the total population for the state has steadily increased, on average, 1.2% per year over the last 10 years (5.15 million in 2019 versus 4.59 million in 2009). We believe that the governmental workforce would also increase as the State's population increases, but at a lower rate than the rate of increase of the State's population because governmental operations continue to use technology to improve service (or provide the same level of service to more people) as measured on a per employee basis. The phase-in of the higher contribution rate for employers in SCRS and PORS will place decrease budgetary resources to increase the number covered employees. The higher contribution rates may also result in some participating employers reorganizing their internal business structure that may reduce the number of their employees earning benefits in the Retirement System.

Given the historical change in contributing payroll (in nominal amount) and future budgetary pressures that some participating employers may experience in part due to scheduled increases in the contribution rates, we recommend a 0.30% decrease in the payroll growth assumption to 2.70% for SCRS and PORS. While the actual payroll growth experience for PORS has been greater than that experienced by SCRS this is a long-term assumption and in-theory we would expect that long-term changes in covered payroll for each system to be relatively the same. This change will have no impact on the actuarial accrued liability, but this assumption will increase the number of years the System is projected to attain a 100% funded ratio. However, a change in the payroll growth assumption becomes less significant assumption as the existing funding period decreases.

Given the structure of the salaries and salary increases provided to members in JSRS, we are recommending the use of a 3.00% payroll growth assumption.

Demographic Assumptions

Actuaries are guided by the Actuarial Standards of Practice (ASOP) adopted by the Actuarial Standards Board (ASB). One of these standards is ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. This standard provides guidance to actuaries giving advice on selecting noneconomic assumptions for measuring obligations under defined benefit plans. We believe the recommended assumptions in this report were developed in compliance with this standard.

Post-Retirement Mortality Rates (Liability and Cost Calculations)

SCRS's actuarial liabilities depend in part on how long retirees live. If members live longer, benefits will be paid for a longer period of time, and the liability will be larger.

In the last experience study, we created mortality tables (i.e. the 2016 Public Retirees of South Carolina Mortality Table) for use in the actuarial valuation of each system because at that time there were not any published mortality tables that were a suitable fit to the actual mortality experience of the non-disabled retirees in the systems maintained by PEBA. This mortality assumption also included an explicit assumption of continued improvement in mortality in future years. Below is a table with the life expectancy for a retired member who attains age 65.

Current Mortality Assumption - Life Expectancy for an Age 65 Retiree in Years					
Group	**Year of Retirement**				
	2020	**2025**	**2030**	**2035**	**2040**
General Employee – Male	20.6	20.9	21.3	21.6	21.9
General Employee - Female	22.7	22.8	23.0	23.2	23.4
Public School Employees - Male	21.2	21.5	21.9	22.2	22.5
Public School Employees - Female	23.6	23.8	24.0	24.1	24.3
PORS - Male	18.9	19.3	19.7	20.0	20.4
PORS - Female	22.7	22.8	23.0	23.2	23.4

Analysis of Credibility of the Retirement Systems' Mortality Experience

Our analysis made use of credibility theory to identify appropriate multipliers to improve the fit of the table to the observed experience. The method for this approach can be found in the article *"Selecting Mortality Tables: A Credibility Approach" October 2008*. Statistical analysis suggests 1,082 deaths per gender is sufficient to be considered fully credible, as at that amount of experience we are 90% confident that the observed experience is within +/- 5% of the actual pattern. The following table gives the number of deaths needed by gender to have a given level of confidence that the data is +/- X% of the actual pattern.

Standard Score	Confidence	99% – 101%	97% – 103%	95% – 105%	90% – 110%	80% – 120%
0.674	75%	4,543	505	182	45	11
1.282	80%	16,435	1,826	657	164	41
1.645	90%	27,060	3,007	1,082	271	68
1.96	95%	38,416	4,268	1,537	384	96
2.576	99%	66,358	7,373	2,654	664	166

The South Carolina Retirement Systems (SCRS and PORS) had 6,860 male and 8,425 female observed deaths for SCRS over the last five years. As shown by the statistical credibility table, we are 99% confident that we are within 3% and 5% of the true mortality experience for males and within 1% and 3% of the true mortality experience for females. We believe five years is reasonable to demonstrate sufficient statistical credibility, but used 7 years of experience in developing the base mortality tables to provide more data (and higher credibility) at the non-core ages of retiree mortality assumption.

Recommended Base Mortality Assumption

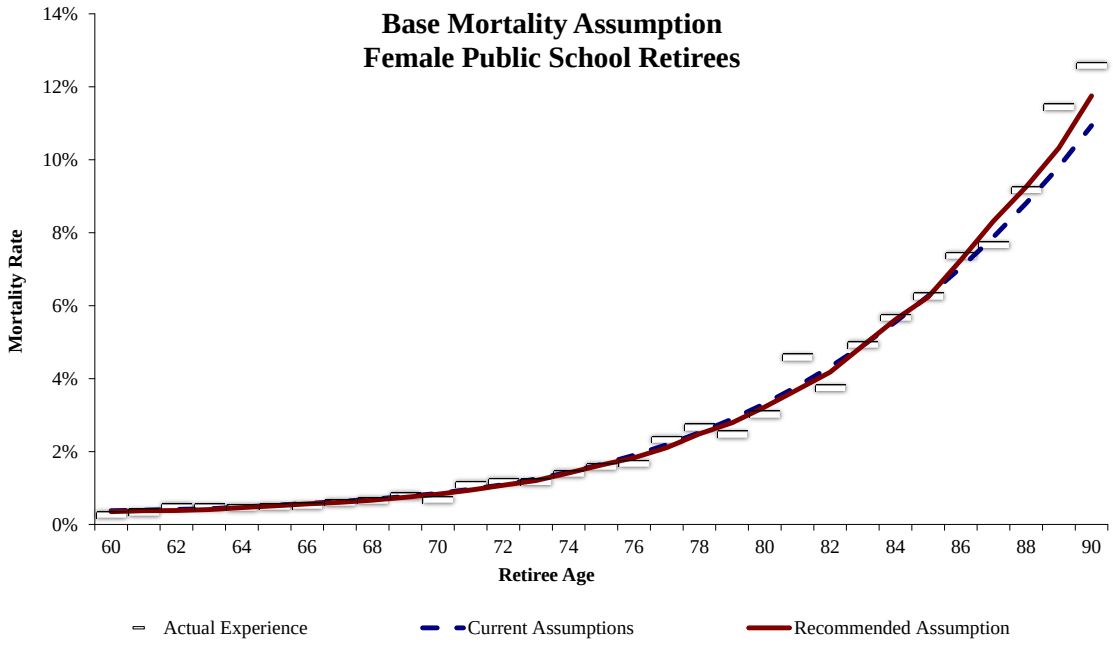
We performed our analysis using a benefit weighted approach, where we measure the exposures and actual deaths as the retiree's benefit amount, rather than a headcount approach that applies an equal weighting to all retirees. Developing a base table with using a benefit weighted approach is preferable because: (1) research studies have consistently shown that higher wage earners generally have a longer life expectancy than lower wage earners and (2) this approach should better model the actual liability that is released when retirees die. Furthermore, a benefit weighted approach is the same method used by the SOA when they develop published mortality tables.

As we previously noted, we created a System specific mortality assumption when we performed the last experience study because published mortality tables available at that time were not a reasonable fit to the System's observed mortality experience. Since the last experience study the Society of Actuaries' (SOA) completed a mortality study based on data solely from public sector pension systems. This study included a separate analysis of mortality experience for teachers, public safety professionals and general employees. The SOA released these mortality tables referred to as Pub-2010 the base mortality tables in their final report dated February 25, 2019. We compared the experience to the current mortality assumption and the relevant Pub-2010 mortality assumption and found that while a multiple of the Pub-2010 mortality tables provided an acceptable fit at retirement ages under age 90, the System's actual mortality experience was materially higher than the published mortality table for retirees beyond age 90. As a result, we recommend continued use of a System Specific mortality assumption, but update the base table to reflect the System's experience since the last experience study.

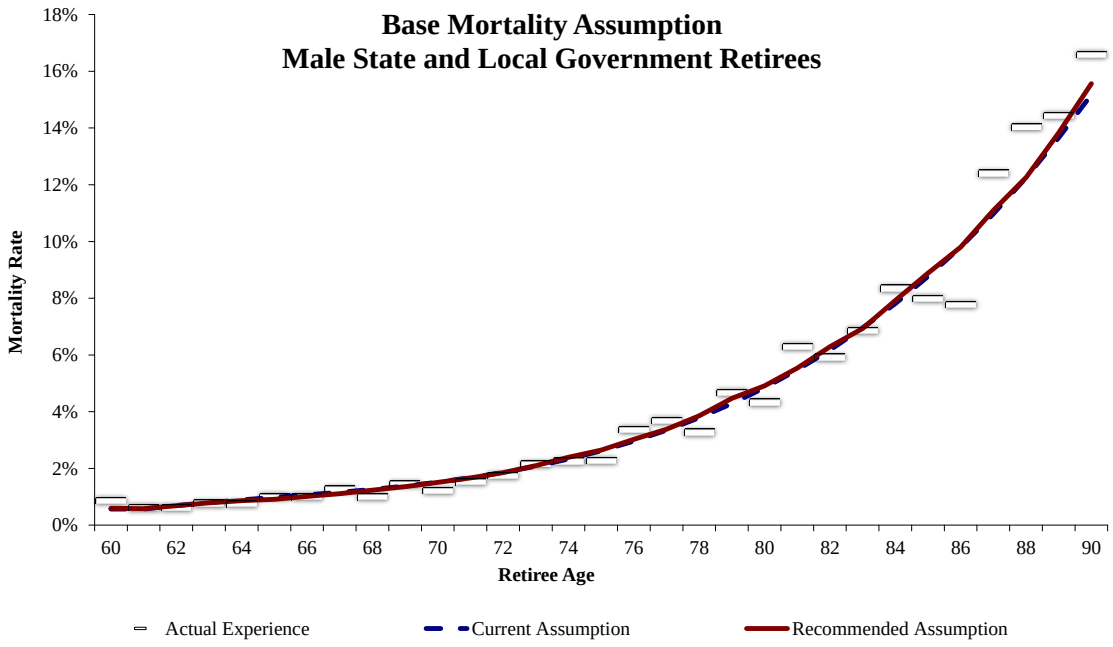
Mortality rates for the core ages of retirees age 60 to 95 are based on the Retirement System's experience, using a cubic spline method to provide a smooth fit to the midpoint of the experience. The mortality rates for 95 and older were developed using a polynomial model. Mortality rates for ages under 60 are equal to the Pub-2010 amount weighted table for general employees adjusted to the center point of the analysis period (i.e. the year 2015) using the year 2020 mortality improvement assumption. The final step in the creation of the base mortality assumption was to project the preliminary table from the center point of the

analysis period to the year 2020 using the mortality improvement assumption. We will refer to this new table as the 2020 Public Retirees of South Carolina Mortality Table (2020 PRSC).

The following is a chart that shows the actual mortality experience assumption for female public school employees (the largest group in the system), along with the current mortality assumption, and the newly created System Specific mortality table. As the chart shows, both the current assumption and the recommended base table provides a very similar fit across the assumption range with slight differences after age 85.



Below is a similar chart showing the same information for male state and local government retirees.



Recommended Mortality Improvement Assumption

Beginning with 2011 actuarial valuations, the Board (Budget and Control Board at that time) adopted a mortality assumption that included an explicit assumption that mortality would improve in future years. The explicit assumption was Scale AA, and was the most common improvement assumption used at that time. Since then, the SOA has created additional mortality improvement assumptions for pension actuaries to consider using which include: Scale BB (released by the SOA in 2012), and Scale MP (which has had six releases in 2014, 2015, 2016, 2017, 2018, and 2019).

Scale AA is based upon a blend of mortality improvement trends among Civil Service Retirement System (CSRS) and Social Security Administration participants between 1977 and 1993. In Scale AA, the rate of improvement in males is approximately twice that of females. While this difference in the rate of improvement for males and females once occurred, it may not be representative of the continued rate of improvement for both genders in future years.

Scale BB was created to bring Scale AA from the year 2000 to the year 2012 and was based on a very specific time period, during which rates of mortality improvement were very high. Based on experience since 2012, and longer time horizons, we consider the approximate 1.5% per year improvement in Scale BB to overstate in the improvement in mortality. In October 2014, the SOA issued final reports of the mortality study that was initiated in 2010 that included the release of another mortality improvement assumption, Scale MP-2014. The SOA has also issued refinements to the MP-2014 improvement assumption each subsequent year (i.e. 2015, 2016, 2017, 2018, and 2019) and in each update, rates of improvement were decreased, meaning the original MP-2014 table was found to overstate the increase in mortality (i.e. life expectancy).

After approximately 15 years, all of the versions of the MP improvement assumptions reflect the same improvement rate at each future calendar year (the ultimate mortality improvement rates) at approximately 1% per year. In order to balance the two objectives of reflecting the most recent data available, while maintaining stability of results from year to year, GRS is recommending the use of these ultimate mortality improvement rates in the MP tables for all years. This is labeled the “UMP” projection scales.

We are recommending using 80% of the UMP projection rates. Mortality rates in South Carolina are amongst the highest in the nation, and the observed rate of improvement continues to be lower than observed in Retirement Systems in other parts of the country. The assumed rate of improvement in mortality for males is approximately the same in Scale AA and UMP. However, the assumed rate of improvement in mortality for females is significantly higher in UMP, so to switch to UMP would increase liabilities and costs. If the underlying data supported the move to UMP, then the increase in liabilities would be appropriate, but the actual experience for females has not even kept up with the rate of change from Scale AA. For example, the life expectancy for a female aged 65 in the 2016 study was 22.5 years. Using Scale AA, the life expectancy for females aged 65 in the 2020 study was projected to be 22.8 years, but instead this study shows the life expectancy to be 22.5 years. Using the 1% per year in the UMP scale would have projected 23.0.

Based on this, the increase in liabilities from such a change would be contrary to the System data and possibly an unnecessary increase.

Thus, we are proposing to use 80% of UMP projection scales for males and females at this time, which does increase liabilities for females, but slightly lowers them for males and creates a similar liability in total as the current assumption, and will monitor this assumption in future studies.

Recommended Non-Disabled Mortality Assumption

Below are the specific mortality assumptions:

State and Local Government Retirees:
Males: 2020 PRSC for Males multiplied by 97%
Females: 2020 PRSC for Females multiplied by 107%

Public School Employees:
Males: 2020 PRSC for Males multiplied by 95%
Females: 2020 PRSC for Females multiplied by 94%

Retirees in PORS:
Males: 2020 PRSC for Males multiplied by 127%
Females: 2020 PRSC for Females multiplied by 107%

The mortality assumption will improve using 80% of the ultimate rates of the MP Scales. Below is a table with the life expectancy for an age 65 retiree, in years, under the recommended mortality assumption.

Life Expectancy for an Age 65 Retiree in Years					
Group	**Year of Retirement**				
	2020	**2025**	**2030**	**2035**	**2040**
General Employee – Male	20.9	21.2	21.5	21.8	22.1
General Employee - Female	23.0	23.3	23.6	23.9	24.2
Public School Employees - Male	21.1	21.4	21.7	22.0	22.3
Public School Employees - Female	24.0	24.3	24.6	24.9	25.2
PORS - Male	18.8	19.1	19.4	19.7	20.0
PORS - Female	23.0	23.3	23.6	23.9	24.2

Recommended Non-Disabled Mortality Assumption for JSRS, GARS, and the SCNG

Below is a table with the actual number of deaths and expected number of deaths based on the current assumption for retirees in JSRS, GARS, and the SCNG.

Mortality Experience for Disabled Retirees for the Five-Year Period Ending June 30, 2019			
		Current Assumption	
Retirement System	Actual	Expected	A/E
JSRS	19	21	90%
GARS	40	55	73%
SCNG	725	755	96%

As the table shows, the number of retirees (and deaths) in these systems do not provide sufficient credibility to establish a mortality assumption based on solely on their own experience. Therefore, we recommend the mortality assumption for the systems be as follows:

JSRS: Same assumption used for retired Public School Employees in SCRS
GARS: Same assumption used for retired State and Local Government employees in SCRS
SCNG: Same assumption used for retirees in PORS

Disabled Retiree Mortality Rates

This is a less significant assumption than the mortality assumption for non-disabled retirees, because only about one out of ten retirees are receiving a disability retirement. However, because the number of disabled retirees is much smaller, there is not sufficient experience to develop a Retirement System specific assumption and we must continue to rely on using a published table.

The current disability mortality assumption for SCRS and PORS is the RP-2014 Disabled Mortality table, with various multipliers applied to the different employee groups and genders to provide an appropriate fit to the experience. While the analysis shows that the current assumption tracked reasonably well to the experience, we recommend using the Pub-2010 Disabled Retiree Mortality tables.

We must rely on professional judgement regarding the appropriate multipliers to use for the base tables for published disability mortality tables. For instance, members in SCRS must qualify for Social Security Disability benefits in order to be eligible to receive a disability retirement benefit in the System, which can be a much higher standard than the disability eligibility provisions in the experience used to develop a published mortality table. These reasons like this will result in differences in mortality and life expectancy experience. Therefore, we recommend using the General Disabled Retiree Mortality for general employees with 140% and 130% multipliers for males and females respectively as well as PORS but without adjustment. For public school employees, we recommend using the Teacher Disabled Retiree Mortality tables with a multiplier of 130% for males and 120% for females. Finally, we also recommend continuing to assume that mortality rates will improve in the future using a fully generational approach, but update the mortality improvement assumption to the ultimate rates of the MP Scales (UMP), to be consistent with the mortality improvement assumption that is used for non-disabled retirees.

Mortality Experience for Disabled Retirees for the Five-Year Period Ending June 30, 2019					
		Current		Recommended	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	709	685	104%	693	102%
General Employee - Female	737	729	101%	761	97%
Public School Employees - Male	241	222	109%	209	117%
Public School Employees – Female	677	717	94%	689	98%
PORS – Males	159	245	65%	173	92%
PORS – Female	47	53	89%	45	104%

There are no disabled retirees in JSRS, GARS and the SCNG. However, we recommend that the disability mortality assumption for JSRS and GARS be updated to use the same disability mortality assumption that is used for disabled retired public school employees and disabled retired general employees, respectively. Since SCNG does not provide a disability benefit, and the census data does not classify any of the retirees in the SCNG as disabled retirees, a disability mortality assumption is not used.

Details are provided in Section X on pages 90-100.

Active Mortality Rates

This is the least significant of all the mortality assumptions because the mortality rates for active members are considerably lower than mortality rates for retired members (nondisabled and disabled). Similar to the mortality assumption for disabled retirees, there are not a sufficient number of deaths during employment within the Retirement System to develop a System specific assumption. Again, we must rely on a published mortality table.

The current mortality assumption for employees is the RP-2014 Mortality Table for Employees, with multipliers applied to provide a better fit for the various employee groups and genders.

To be consistent with our recommendation of the disabled retiree mortality assumptions, we recommend adopting the Pub-2010 Mortality Tables for Employees. For general employees and GARS we recommend the Pub-2010 General Employee tables with multipliers of 135% for both males and females. For public school employees and JSRS we recommend using the Pub-2010 Teacher Employee tables with multipliers of 130% for males and 110% for females. For PORS and SCNG we recommend the Pub-2010 Safety Employee tables with no adjustment. Finally, given the relative insignificance of this assumption, we believe it is reasonable to continue to use static mortality assumption.

Details are shown in Section X on pages 101-106.

There is also an assumption regarding the prevalence of active members who die as a result of a job-related injury. Since calendar year 2013 there were 16 and 21 job-related deaths for SCRS and PORS, respectively. As a result, we recommend no change the 5% job-related death assumption for SCRS and increasing this assumption from 5% to 10% for PORS.

Disability Incidence

The disability rates are intended to reflect the probability that a member will retire with a disability retirement allowance. We analyzed the disability experience separately by gender for general employees, public school employees, and members in PORS. Because there are a relatively few number of females in PORS, we combined the males and females to increase the credibility of the experience.

We compared the number of actual and expected disabilities by group, taking into account the fact that members with less than five years of service and members eligible for retirement are not eligible for ordinary disability. We also reviewed the data to determine if there was a noticeable lag in the Retirement System's classifying a retiree as a disabled retiree. From our observations, we did not include an explicit adjustment to the actual experience to account for disabled retirees that are not initially classified as a disabled retiree in the following year's census information we receive from PEBA, but we did consider the classification lag in our recommended assumption. Also, the disability retirement benefit provided by SCRS and PORS is the same for all types of disability (i.e. duty and non-duty related disabilities). Therefore, a separate analysis was not performed regarding the type of disability.

Below is a table with a summary of the results of the analysis for the five-year period ending June 30, 2019.

Number of Disability Incidences for the Five-Year Period Ending June 30, 2019					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	577	962	60%	647	89%
General Employee - Female	722	1,310	55%	811	89%
Public School Employees - Male	74	227	33%	86	86%
Public School Employees - Female	280	870	32%	343	82%
PORS – Males and Females	512	588	87%	588	87%

The number of disabilities over the last five years was significantly less than expected for SCRS. The 2012 pension reform legislation (Act 278) changed the disability eligibility provisions and made it more restrictive for members to be eligible to receive a disability retirement after January 1, 2014 and resulted in a fewer than expected number of disability instances. Based on the experience, we are recommending a decrease in the disability rates for general and public school employees to be more consistent with recent experience. The experience for members in PORS continues to be a reasonable fit to the current assumption, so we are not recommending any change at this time.

There were no actual disability retirements in JSRS. Since JSRS has a disability benefit provision it is appropriate to have a disability incidence assumption. Specifically, we recommend JSRS use the same disability incidence rates that are used for public school employees. GARS also has a disability benefit provision, but there have not been any disability retirements in the last five years. Therefore, we recommend using the same disability incidence rates as public school employees. SCNG does not provide a disability retirement benefit; however, it is reasonable to expect that disability discharges in the SCNG occur. The census data we receive does not provide identifiers regarding disability events, therefore we recommend using the same disability assumption as PORS.

Details are shown in Section X on pages 107-111.

We also reviewed data provided by PEBA regarding the prevalence of in line-of-duty and non-duty related disabilities for members in SCRS and PORS. The current assumption is 25% of the disabilities are line-of-duty related for PORS. We historically have not made a distinction for SCRS because duty related and nonduty related disability benefits are identical. Below is a table with the prevalence of line-of-duty disabilities for the last five years and the recommended assumption.

System	Historical Line-of-Duty %	Recommended Assumption
SCRS (all members)	8%	10%
PORS	30%	30%

Termination Rates

Termination rates reflect the probability of members leaving for any reason other than death, disability, or service retirement. They apply whether the termination is voluntary or involuntary, and whether the member takes a refund or keeps his/her account balance on deposit. The current termination rates are composed of two distinct assumptions, one for the first ten years of service that we refer to as the "select" period and a separate assumption for terminations after the ten year period that we refer to as the "ultimate" period. Different assumptions are applied to public school employees and general employees. The termination rates during the select period are based on the member's service and gender. The ultimate assumption is based on the member's years from retirement eligibility and service. For this analysis, we have reviewed the experience for these career periods (i.e. early career and late career) separately.

A higher paid member has a greater liability relative to a lower paid member. Along those lines, the termination pattern for the higher paid members will have more impact on the future liabilities of the plan. Therefore, we have weighted the experience by salary and are counting the payroll and the portion of the payroll that terminates employment (versus headcount) for the last 10 years. For this assumption, it is more conservative to have an A/E ratio over 100%.

General Employees and Public School Employees

Termination rates were studied separately for the members' first 10 years of employment and years from retirement. The results of these separate analyses were merged to create a single table of termination rates based on age and service. The following are tables with a summary of the results for the termination rates by employee group and gender:

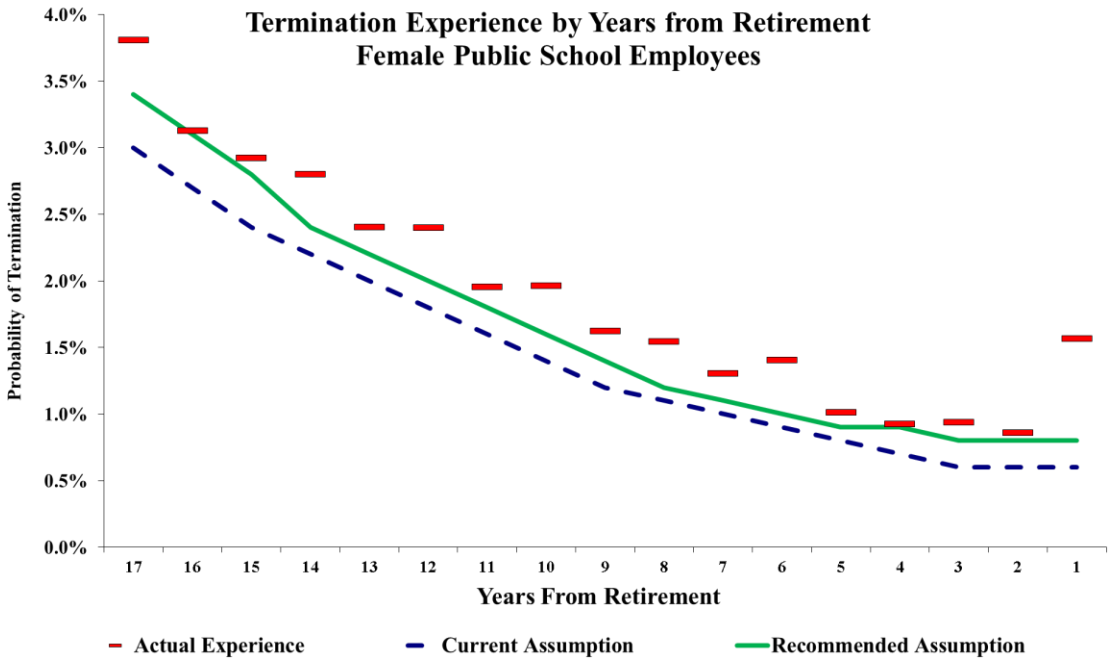
($ in thousands of payroll)

General Employees					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
Male	$1,459,364	$1,262,907	116%	$1,343,353	109%
Females	2,282,937	2,044,638	112%	2,127,109	107%

Public School Employees					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
Male	$380,876	$392,892	97%	$362,254	105%
Females	1,129,270	928,942	122%	1,019,707	111%

As the tables show, the rates of termination were slightly increased for every group except male public school employees. The analysis indicated that termination experience is still correlated with service, but less so with age. Therefore, the recommended assumption during the member's first 10-years of service is based strictly on the member's service.

Termination probabilities continue to be correlated to the member's number of years until retirement. For illustrative purposes, below is a chart with the actual experience and recommended assumption for female public school employees who are within 17 years of retirement.



Generally, there have been more terminations than expected, especially for members with more than 10 years of service. Increasing the termination probabilities will decrease the number of projected members who will continue employment to retirement age. As a result, the Systems will experience some decrease in liability and cost as a result of this recommended assumption change. Details of the termination experience for SCRS are provided in Section X on pages 112-119.

PORS

Members in PORS have hire ages that are more closely grouped together at younger ages (i.e. early in their career). Therefore, the majority of members attain the 25 years of service retirement eligibility condition before the age 55 eligibility requirement. Therefore, a termination structure based solely on service is sufficient without introducing unwanted bias in assumption. The current termination rates provide a reasonable fit across the spectrum of the assumption. Therefore we are not recommending any changes to the current assumption. Details are shown in Section VII on page 120.

JSRS, GARS and the SCNG

Members in JSRS are currently not assumed to terminate employment prior to retirement. Given the nature of their employment, this is a logical and reasonable assumption. In addition, experience during the last five year period supports this assumption. We recommend continuing to assume all members remain active in the system until retirement.

Similarly, there is no termination assumption for members in GARS. While it periodically occurs where a member becomes inactive because they decide not to run for office or win a reelection, this retirement plan has a special provision that allows inactive members to elect to continue earning future service in the system by contributing the required member contributions (i.e. special contributing member). As a result of this special provision, we assume that all eligible inactive members elect to become special contributors to continue earning retirement benefits. Therefore, the current assumption is reasonable and appropriate.

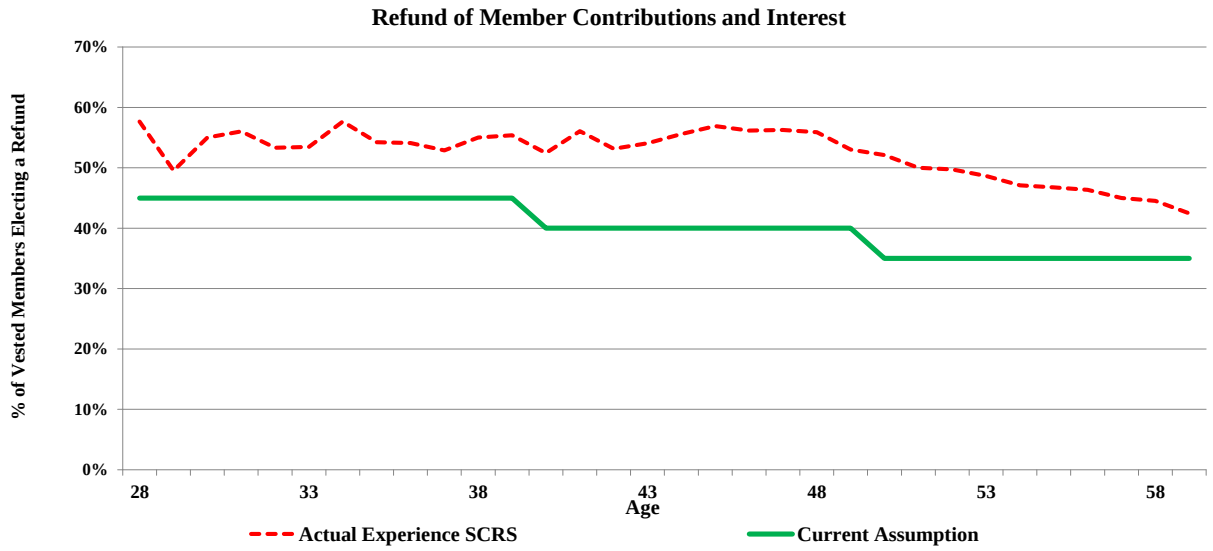
The actuarial valuation for the SCNG currently has a 2.5% per year termination assumption for members under age 60 with 20 through 24 years of service and 5.0% per year with 25 through 29 years of service. Experience for the last five years shows that more members with 20 to 24 years of service became inactive than currently assumed. As a result, we are increasing the termination assumption to 10% for members with 20 years of service and 5.0% for members with 21 to 24 years of service.

Refund of Member Contributions and Interest for SCRS

If a member terminates employment with a vested benefit (i.e. after five years of service for Class Two members and eight years of service for Class Three members) but prior to their retirement age, they may keep their member contributions in the System and receive a monthly annuity when they reach their eligible retirement age or withdraw their member contributions at any time and forfeit their monthly annuity. Currently, the valuation for SCRS applies an explicit refund assumption that varies by age, while the valuation for PORS assumes that members will refund their contributions if the value of their member contributions exceeds the value of their deferred monthly retirement benefit.

The 2012 and 2017 legislation increased the member contribution rates, which will result in even greater member contribution balances. The legislation also ceased providing interest on the member contribution balance after the employee terminates employment. The combination of larger contribution balances and the psychological effect of knowing the balance does not earn additional interest post-employment have resulted in many employees electing a refund of their contribution balance, even when it may be less valuable than the deferred monthly benefit. Therefore, we recommend keeping an explicit assumption that is more consistent with employee behavior.

Below is a table with the actual refund behavior for vested members in SCRS as well as a recommended assumption, which is unchanged. Note, this analysis excludes members who terminate employment prior to becoming vested in their retirement benefit because the only benefit these members will receive is a refund of their contributions with interest.



Retirement Rates

The retirement rates are used to model when an employee will commence their retirement allowance. There are separate assumptions for males and females, and for General Employees, Public School Employees, and PORS. Since retirement eligibility can be strictly service based, the assumed rate of retirement is also based on the member's service. This means that the same rate of retirement is applied to all members of the same service, regardless of differences in age. There is an additional retirement probability applied for the age a member is first eligible to commence their retirement benefit and return to employment without being subject to working retiree restrictions.

For this assumption we have weighted the experience by the member's liability; in other words, we have counted the liability and the portion of the liability that retires. Thus, the retirement pattern for the members with a greater liability will have a larger impact on the future liabilities of the plan. For this assumption, it is more conservative to have an A/E ratio less 100%, however, it is still reasonable to have an A/E ratio greater than 100% if there is reason to believe that future retirement experience will be different than the experience period reviewed.

SCRS and PORS

The pension reform legislation enacted during the 2012 legislative session included substantial changes to certain retirement provisions. There are separate retirement assumptions that are applied to the Class Two and Class Three members due to differences in retirement eligibility. However, since there is no experience yet to measure for these members, we are not recommending any changes to the current assumption for Class Three members in SCRS. On the other hand, the recommended updates to the service based retirement assumption for Class Two members in PORS will also be applied to Class Three Members (but shifted from 25 years of service to 27 years of service).

The 2012 pension reform legislation also included provision changes that resulted in it becoming more difficult for a member to commence their retirement benefit and return to work with a participating

employer and concurrently continue to receive their retirement allowance. Secondly, the Teacher and Employee Retention Incentive Program (TERI) was completely phased-out on June 30, 2018. When the 2012 pension reform bill was enacted, the retirement assumption was modified to reflect the long-term anticipated retirement behavior, with some additional adjustments to the retirement assumption when the 2015 experience study was performed. As a result of these changes we must be careful in how we use the historical experience for predicating future retirement behavior for SCRS. We used the last five-years of experience in this analysis, but we also placed increased emphasis on the last two years of experience, or experience from July 1, 2017 through June 30, 2019 in determining the recommended retirement assumptions for SCRS. On the other hand, we believe the retirement experience for members to be highly credible as the effective date of all the provision changes affecting retirement behavior were during the experience study period for members in PORS.

The table shows the actual retirements as well as the expected retirements under the current and proposed assumptions for the membership groups in SCRS that elect a reduced retirement benefit. Note, this assumption is less significant than the rates of retirement with an unreduced benefit because the unreduced retirement benefit is relatively more valuable and the majority of employees work until they are eligible for an unreduced retirement benefit.

($ in thousands of Liability)

Reduced Retirements for the Five Year Period Ending June 30, 2019					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	$259,589	$382,243	68%	$306,126	85%
General Employee - Female	405,536	568,290	71%	465,684	87%
Public School Employees - Male	125,549	130,665	96%	139,435	90%
Public School Employees - Female	503,095	531,899	95%	516,386	97%

The table shows the actual retirements as well as the expected retirements under the current and proposed assumptions for the membership groups in SCRS that elect an unreduced retirement benefit.

Unreduced Retirements for the Five-Year Period Ending June 30, 2019					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	$1,629,462	$1,524,561	107%	$1,481,537	110%
General Employee - Female	1,255,676	1,319,254	95%	1,343,550	93%
Public School Employees - Male	265,549	155,514	171%	207,678	128%
Public School Employees - Female	1,247,084	671,544	186%	863,234	144%
PORS – Males and Females	892,238	884,178	101%	924,544	97%

As the table shows, except for female general employees, there were more retirements in SCRS than expected during the five year period ending June 30, 2019. However, we believe that since TERI was still open through June 30, 2018 it had an influence on retirement behavior especially for teachers during the first several years of the observation period. While we decreased the rate of retirement for members in SCRS (teachers and nonteachers) at the age they are first eligible to commence an unreduced retirement benefit, we did increase the rates of retirement at many ages in the age based assumption and at most service increments in the service based assumption.

The overall number of PORS members that retired was slightly more than expected. The recommended retirement rates remain unchanged at most years of the age based retirement assumption and were increased for the service based retirement assumption. Namely, we observed there were more than expected members retiring in the years after attaining 26 years of service, and more members are retiring than expected in the ages 58 through 60, which is when a member can commence their retirement benefit and seek reemployment without being subject to the earnings limit.

Details of the retirement experience for Class Two members are shown in Section X pages 121-130.

Other Retirement Systems (JSRS, GARS, and the SCNG)

Similar to SCRS and PORS, a benefit-weighted approach was used to review the retirement experience for JSRS. However, we reviewed the retirement experience on a headcount basis for GARS and the SCNG due to the relatively small number of retirees and because benefits earned by members in these systems are uniform (i.e. salaries are identical for members in GARS and irrelevant for determining benefits provided by the SCNG).

Retirements for the Five-Year Period Ending June 30, 2019					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
JSRS	$30,155	$43,858	69%	$36,219	83%
GARS	15	35	43%	21	72%

Note: The experience for JSRS was measured on a liability weighted basis. The experience for GARS was measured on a headcount basis and only reflects legislators retiring before attaining age 70.

The design of these retirement systems has a significant influence on retirement behavior. For example, in JSRS the retirement benefit is capped at 90% of pay for the Judges upon attaining 32 years of service (31 years for Solicitors and Public Defenders) and these members are allowed to commence their retirement benefit while continuing to service their position. As a result, almost all judges commence their retirement when the benefit attains the 90% of pay cap. We recommend continued use of a service base assumption with an increase in rates for member with 15 to 20 years of service (i.e. Judges and Solicitors who first became members in the System later in their career) while decreasing the rates of retirement for members with 21 to 31 years of service.

We continued to use an age based retirement structure for GARS. The rates of retirement were decreased at ages 60 and after to better reflect anticipated experience. As the number of active members in GARS continues to decrease the retirement assumption becomes less predictable due to a fewer number of members, and also less significant because a greater portion of the actuarial accrued liability will be attributable to inactive members and retirees.

We recommended an increase in the rate of retirement for members in the SCNG with between 20 and 24 years of service. Members who are honorably discharged prior to age 60 with a vested benefit are assumed to commence their benefit at age 60. There are members who serve with the National Guard beyond thirty years however, this has no material impact on the retirement system's liability since their benefit payable from the plan is fully accrued (i.e. the $100 maximum monthly benefit). The new rates are shown in Section X pages 131-133.

Other Assumptions

There are other assumptions made in the course of a valuation, such as the percentage of members who are married, the age difference between members and spouses, unused annual and sick leave, etc. We have thoroughly reviewed all of these ancillary assumptions, and believe they are generally realistic and/or conservative. Therefore, we recommend no changes to these other assumptions.

Actuarial Cost Method

The individual Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of the System. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year to year, and allocates costs among various generations of taxpayers in a reasonable manner. It is by far the most commonly used actuarial cost method for large public retirement systems. We continue to believe this is the most appropriate funding method and recommend no change.

For members who have correlated service with another employer, the cost method will assume the member has no accrued liability at the date of hire and will accrue all benefits from the hire date with the current employer. Service from the other employers will be used in determining retirement eligibilities, but not in allocating the accruals over the career of the employee.

Actuarial Asset Method

The purpose of using an actuarial asset method is to dampen the short-term volatility in the financial market while ensuring that a large investment (gain) or loss that occurs in a single year is fully recognized within a five-year period.

In the 2015 experience study, the Board adopted the current actuarial asset method, which the actuarial value of assets is based on a calculation method that recognizes an investment gain or loss occurring each year over the subsequent five years at the rate of 20% per year. This asset method is the most common asset valuation method used by large public retirement systems and we do not recommend any changes.

Funding Policy

The funding reform enacted in 2017 amended the South Carolina State Code to specify the employer contribution rate for SCRS and PORS as well as specify a maximum permitted funding period that is 28 years as of 2019 and will decrease to 20 years in the year 2027. We believe this new funding policy will substantially improve the sustainability of these two Systems.

We believe the Board's update to the funding policy for JSRS that established a minimum contribution rate based on the same maximum funding period for SCRS is appropriate and the State's increased payroll based contributions and annual appropriations are expected to continue to be sufficient to satisfy the Board's funding policy. We also expect the current level of contributions to be sufficient to result in positive amortization of the unfunded liability.

The funding period for GARS in the next actuarial valuation (i.e. July 1, 2020 valuation) will be 7 years. As the funding period decreases, the volatility, or year-to-year change, in the contribution requirement will increase. To provide increased stability in the contribution requirements and still achieving PEBA's goal of fully funding the plan, we recommend using a layered amortization method that separately amortizes each years' *new* gains and losses over a closed 10-year period. Since the SCNG is also funded over a closed period, we recommend the same policy for determining the contribution requirements for the SCNG.

Contribution rate volatility is a less significant issue for the SCNG since the current period for funding gains and losses in the SCNG will be 16 years next year. However, applying the same layered amortization policy to the SCNG at the same time would be consistent between the two systems.

Considerations for Next Experience Study

South Carolina State Code requires an experience study to be conducted by the actuary at least once every five years. After the 2015 experience study the Board made a decision to conduct an experience study after a four-year period. We recommend PEBA to again conduct the next experience study for all demographic and economic assumptions four years from now (which would be for the period ending June 30, 2023). It may be necessary for the Board to conduct a review of the economic assumptions (i.e. price inflation and investment return assumption) prior to the next experience study depending on the General Assembly's changes to the provisions in Statute regarding the investment return assumption review process.

SECTION IV

ACTUARIAL IMPACT OF RECOMMENDATIONS

Estimated Actuarial Impact of Recommendations

The following pages provide the financial impact of the recommended assumptions for each retirement system.

Estimated Actuarial Impact for SCRS and PORS

The demographic assumptions adopted by the Board would be first used in preparing the 2020 actuarial valuation. However, the investment return assumption does not expire until June 30, 2021 and a new assumption adopted by the General Assembly would change beginning with the July 1, 2021 actuarial valuation. As a result of this timing, we are illustrating the projected financial impact for SCRS and PORS in 2021, the first year the assumption would presumably be used in an actuarial valuation. Column (1) provides the actuarial valuation results based on the 2019 actuarial valuation, the last valuation performed for the System. Column (2) is the projected actuarial valuation results based on the current assumptions used to prepare the 2019 actuarial valuation. The purpose of this column is to provide stakeholders a baseline for comparing the effect of the demographic and investment return assumptions. Column (3) is the projected valuation results based on the recommended demographic assumptions, which include reducing the payroll growth assumption to 2.70%. Finally column (4) shows the projected valuation results that include the recommended demographic assumptions and reducing the investment return assumption to 7.00%.

Estimated Actuarial Impact for JSRS, GARS, and SCNG

The timing to incorporate the recommended demographic and economic assumptions for the three smaller systems maintained by PEBA (JSRS, GARS, SCNG) will be the same as SCRS and PORS. However, due to the relative financial size of these Systems, we have not prepared projections the same as SCRS and PORS. Rather, to provide stakeholders the fiscal impact information is based on a pro forma as if those assumptions were first used in preparing the 2019 actuarial valuation. In actuality, the 2019 actuarial valuation will not be restated and the demographic assumptions will be first used to prepare the July 1, 2020 actuarial valuation and the investment return assumption will be first used in the July 1, 2021 actuarial valuation.

Fiscal Impact SCRS

(Dollar amounts expressed in thousands)

		2019 Valuation	Projected Results in Year 2021 (First Year the New Investment Return Assumption Adopted)		
		Current Assumptions	Current Assumptions 3.00% Payroll Growth	New Assumptions 7.25% Interest 2.70% Payroll Growth	New Assumptions 7.00% Interest 2.70% Payroll Growth
		(1)	(2)	(3)	(4)
1.	Projected payroll of active members[1]	$ 9,272,010	$ 9,756,983	$ 9,739,938	$ 9,739,938
2.	Total normal cost rate	10.64%	10.57%	10.38%	10.91%
3.	Total actuarial accrued liability				
	a. Retirees and beneficiaries	$ 31,051,873	$ 32,482,821	$ 32,547,113	$ 33,215,674
	b. Inactive members	1,248,924	1,403,536	1,407,798	1,425,352
	c. Active members	18,138,010	19,230,001	19,248,720	20,034,084
	d. Total	$ 50,438,807	$ 53,116,358	$ 53,203,631	$ 54,675,110
4.	Actuarial value of assets	$ 27,443,804	$ 30,101,763	$ 30,067,761	$ 30,067,761
5.	Unfunded actuarial accrued liability (UAAL) (Item 3d - Item 4)	$ 22,995,003	$ 23,014,595	$ 23,135,870	$ 24,607,349
6.	Funded Ratio	54.4%	56.7%	56.5%	55.0%
7.	Funding period based on the required employer contribution rate (years)[2]	20.7	15.8	16.3	18.1
8.	Applicable statutorily required contribution rates[3]				
	a. Employer contribution rate	16.56%	18.56%	18.56%	18.56%
	b. Member contribution rate	9.00%	9.00%	9.00%	9.00%

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

[2] The funding period for 2019 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2021. For the 2019 valuation results that is the FY 2021 (i.e. beginning July 1, 2020 and ending June 30, 2021). For the projected 2021 valuation results that is the FY 2023 (i.e. beginning July 1, 2022 and ending June 30, 2023).

[3] The employer contribution rates in effect for FY 2020, FY 2021, FY 2022, and FY 2023 are 15.56%, 16.56%, 17.56% and 18.56% of pay, respectively. These contribution rates include the cost of incidental death benefits.

Fiscal Impact PORS

(Dollar amounts expressed in thousands)

		2019 Valuation	Projected Results in Year 2021 (First Year the New Investment Return Assumption Adopted)		
		Current Assumptions	Current Assumptions 3.00% Payroll Growth	New Assumptions 7.25% Interest 2.70% Payroll Growth	New Assumptions 7.00% Interest 2.70% Payroll Growth
		(1)	(2)	(3)	(4)
1.	Projected payroll of active members[1]	$ 1,378,255	$ 1,458,991	$ 1,458,613	$ 1,458,613
2.	Total normal cost rate	14.54%	14.42%	14.68%	15.39%
3.	Total actuarial accrued liability				
	a. Retirees and beneficiaries	$ 4,514,202	$ 4,983,301	$ 4,973,191	$ 5,085,240
	b. Inactive members	238,486	211,414	209,729	216,410
	c. Active members	2,984,727	3,161,120	3,162,724	3,296,265
	d. Total	$ 7,737,415	$ 8,355,835	$ 8,345,644	$ 8,597,915
4.	Actuarial value of assets	$ 4,852,573	$ 5,509,589	$ 5,504,366	$ 5,504,366
5.	Unfunded actuarial accrued liability (UAAL) (Item 3d - Item 4)	$ 2,884,842	$ 2,846,246	$ 2,841,278	$ 3,093,549
6.	Funded Ratio	62.7%	65.9%	66.0%	64.0%
7.	Funding period based on the required employer contribution rate (years)[2]	18.1	14.1	14.8	17.4
8.	Applicable statutorily required contribution rates[3]				
	a. Employer contribution rate	19.24%	21.24%	21.24%	21.24%
	b. Member contribution rate	9.75%	9.75%	9.75%	9.75%

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

[2] The funding period for 2019 is determined on an actuarial value of asset basis and is based on the contribution rate scheduled to become effective for FY 2021. For the 2019 valuation results that is the FY 2021 (i.e. beginning July 1, 2020 and ending June 30, 2021). For the projected 2021 valuation results that is the FY 2023 (i.e. beginning July 1, 2022 and ending June 30, 2023).

[3] The employer contribution rates in effect for FY 2020, FY 2021, FY 2022, and FY 2023 are 18.24%, 19.24%, 20.24% and 21.24% of pay, respectively. These contribution rates include the cost of incidental death benefits.

Fiscal Impact JSRS

Pro Forma of Cost Estimate Based on the 2019 Actuarial Valuation

(Dollar amounts expressed in thousands)

		Current Assumptions (1)	New Assumptions 7.25% Interest (2)	For Illustration New Assumptions 7.00% Interest (3)
1.	Projected payroll of active members[1]	$ 30,346	$ 30,346	$ 30,346
2.	Present value of future pay	$ 194,700	$ 214,274	$ 217,689
3.	Normal cost rate			
	a. Total normal cost rate	29.57%	29.00%	30.54%
	b. Less: member contribution rate	-10.00%	-10.00%	-10.00%
	c. Employer normal cost rate	19.57%	19.00%	20.54%
4.	Actuarial accrued liability for active members			
	a. Present value of future benefits	$ 183,374	$ 186,269	$ 194,928
	b. Less: present value of future normal costs	(54,506)	(58,128)	(62,249)
	c. Actuarial accrued liability	$ 128,868	$ 128,141	$ 132,679
5.	Total actuarial accrued liability			
	a. Retirees and beneficiaries	$ 268,747	$ 274,417	$ 280,387
	b. Inactive members	2,131	2,175	2,246
	c. Active members (Item 4c)	128,868	128,141	132,679
	d. Total	$ 399,746	$ 404,733	$ 415,312
6.	Actuarial value of assets	$ 167,119	$ 167,119	$ 167,119
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 232,627	$ 237,614	$ 248,193
8.	Funded Ratio	41.8%	41.3%	40.2%
9.	Required Contribution Rate			
	a. Employer normal cost rate	19.57%	19.00%	20.54%
	b. Employer contribution rate available to amortize the UAAL	43.37%	43.94%	42.40%
	c. Total employer contribution rate[2]	62.94%	62.94%	62.94%
10.	Funding period based on the required employer contribution rate (years)[3]	20.5	20.2	21.8

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

[2] The 62.94% contribution rate is for the fiscal year beginning July 1, 2019 and certified by the Board to conform with the funding in the State Budget. The contribution rate includes the cost of incidental death benefits.

[3] The calculated funding period also assumes the System will receive $2.9 million in annual appropriations while the System has unfunded liability.

Fiscal Impact GARS

Pro Forma of Cost Estimate Based on the 2019 Actuarial Valuation

(Dollar amounts expressed in thousands)

		Current Assumptions (1)	New Assumptions 7.25% Interest (2)	For Illustration New Assumptions 7.00% Interest (3)
1.	Projected payroll of active members	$ 1,570	$ 1,570	$ 1,570
2.	Present value of future pay	$ 8,266	$ 9,146	$ 9,239
3.	Normal cost rate			
	a. Total normal cost	$ 360	$ 332	$ 350
	b. Less: member contributions	(173)	(173)	(173)
	c. Employer normal cost	$ 187	$ 159	$ 177
4.	Actuarial accrued liability for active members			
	a. Present value of future benefits	$ 14,920	$ 14,573	$ 15,078
	b. Less: present value of future normal costs	(1,605)	(1,678)	(1,776)
	c. Actuarial accrued liability	$ 13,315	$ 12,895	$ 13,302
5.	Total actuarial accrued liability			
	a. Retirees and beneficiaries	$ 55,781	$ 56,191	$ 57,215
	b. Inactive members	2,959	2,961	3,044
	c. Active members (Item 4c)	13,315	12,895	13,302
	d. Total	$ 72,055	$ 72,047	$ 73,561
6.	Actuarial value of assets	$ 35,140	$ 35,140	$ 35,140
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 36,915	$ 36,907	$ 38,421
8.	Funded Ratio	48.8%	48.8%	47.8%
9.	Annual Required Contribution			
	a. Employer normal cost	$ 187	$ 159	$ 177
	b. Employer contribution to amortize the UAAL	5,769	5,768	5,999
	c. Total employer contribution	$ 5,956	$ 5,927	$ 6,176
10.	Funding period (years)	8	8	8

Fiscal Impact SCNG

Pro Forma of Cost Estimate Based on the 2019 Actuarial Valuation

(Dollar amounts expressed in thousands)

		Current Assumptions (1)	New Assumptions 7.25% Interest (2)	For Illustration New Assumptions 7.00% Interest (3)
1.	Normal cost rate			
	a. Total normal cost	$ 820	$ 769	$ 835
	b. Less: member contributions	0	0	0
	c. Employer normal cost	$ 820	$ 769	$ 835
2.	Actuarial accrued liability for active members			
	a. Present value of future benefits	$ 27,285	$ 26,062	$ 27,760
	b. Less: present value of future normal costs	(7,472)	(6,797)	(7,535)
	c. Actuarial accrued liability	$ 19,813	$ 19,265	$ 20,225
3.	Total actuarial accrued liability			
	a. Retirees and beneficiaries	$ 35,589	$ 35,437	$ 35,998
	b. Inactive members	11,121	10,998	11,344
	c. Active members (Item 4c)	19,813	19,265	20,225
	d. Total	$ 66,523	$ 65,700	$ 67,567
4.	Actuarial value of assets	$ 31,122	$ 31,122	$ 31,122
5.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 35,401	$ 34,578	$ 36,445
6.	Funded Ratio	46.8%	47.4%	46.1%
7.	Annual Required Contribution			
	a. Employer normal cost	$ 820	$ 769	$ 835
	b. Employer contribution to amortize the UAAL	4,368	4,283	4,409
	c. Total employer contribution	$ 5,188	$ 5,052	$ 5,244
8.	Funding period (years)	17	17	17

SECTION V

SUMMARY OF NEW ASSUMPTIONS (SCRS)

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 7.00% net of investment and administrative expenses composed of a 2.25% inflation component and a 4.75% 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 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	6.50%	9.50%	8.00%	11.00%
2	4.00%	7.00%	7.75%	10.75%
3	2.25%	5.25%	3.50%	6.50%
4	1.75%	4.75%	2.50%	5.50%
5	1.50%	4.50%	2.25%	5.25%
6	1.25%	4.25%	2.00%	5.00%
7	1.25%	4.25%	1.75%	4.75%
8	1.00%	4.00%	1.50%	4.50%
9	1.00%	4.00%	1.50%	4.50%
10	0.75%	3.75%	1.25%	4.25%
11	0.75%	3.75%	1.25%	4.25%
12	0.50%	3.50%	1.00%	4.00%
13	0.50%	3.50%	0.75%	3.75%
14	0.50%	3.50%	0.75%	3.75%
15	0.50%	3.50%	0.50%	3.50%
16	0.50%	3.50%	0.50%	3.50%
17	0.50%	3.50%	0.25%	3.25%
18	0.50%	3.50%	0.25%	3.25%
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 is 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.

Class Two Annual Age Based Retirement Rates								
Age	General Employees				Teachers			
	Reduced		Normal*		Reduced		Normal*	
	Male	Female	Male	Female	Male	Female	Male	Female
55	7%	9%	0%	0%	14%	10%	0%	0%
56	7%	9%	0%	0%	14%	10%	0%	0%
57	7%	9%	0%	0%	14%	10%	0%	0%
58	7%	9%	0%	0%	14%	10%	0%	0%
59	7%	9%	0%	0%	14%	10%	0%	0%
60	7%	9%	0%	0%	14%	10%	0%	0%
61	7%	9%	0%	0%	14%	10%	0%	0%
62	15%	15%	0%	0%	20%	20%	0%	0%
63	15%	15%	0%	0%	20%	20%	0%	0%
64	15%	15%	0%	0%	20%	20%	0%	0%
65	0%	0%	35%	35%	0%	0%	35%	35%
66	0%	0%	20%	25%	0%	0%	25%	30%
67	0%	0%	20%	25%	0%	0%	25%	30%
68	0%	0%	20%	20%	0%	0%	25%	30%
69	0%	0%	20%	20%	0%	0%	20%	20%
70	0%	0%	20%	20%	0%	0%	20%	20%
71	0%	0%	20%	20%	0%	0%	20%	20%
72	0%	0%	20%	20%	0%	0%	20%	20%
73	0%	0%	20%	20%	0%	0%	20%	20%
74	0%	0%	20%	20%	0%	0%	20%	20%
75	0%	0%	100%	100%	0%	0%	100%	100%

* Retirement rate 35% at the later of age 62 or their 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 Annual Service Based Retirement Rates*				
Years of Service	General Employees		Teachers	
	Male	Female	Male	Female
28	15%	20%	15%	15%
29	15%	20%	15%	12%
30	10%	10%	10%	12%
31	10%	10%	10%	12%
32	10%	10%	10%	12%
33	10%	20%	10%	12%
34	10%	20%	10%	12%
35	10%	20%	10%	12%
36	20%	20%	10%	15%
37	20%	20%	10%	15%
38	20%	20%	10%	15%
39	20%	20%	10%	15%
40 & Over	100%	100%	100%	100%

* Retirement rate 35% at the later of age 62 or their first eligible for a normal retirement benefit, the first age the member is eligible to concurrently commence benefits and continue employment.

Class Three Annual Age Based Retirement Rates									
Age	General Employees				Teachers				
	Reduced		Normal*		Reduced		Normal*		Rule of
	Male	Female	Male	Female	Male	Female	Male	Female	90 **
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	7%	9%	0%	0%	14%	10%	0%	0%	20%
61	7%	9%	0%	0%	14%	10%	0%	0%	20%
62	15%	15%	0%	0%	20%	20%	0%	0%	20%
63	15%	15%	0%	0%	20%	20%	0%	0%	20%
64	15%	15%	0%	0%	20%	20%	0%	0%	20%
65	0%	0%	35%	35%	0%	0%	35%	35%	20%
66	0%	0%	20%	25%	0%	0%	25%	30%	20%
67	0%	0%	20%	25%	0%	0%	25%	30%	20%
68	0%	0%	20%	20%	0%	0%	25%	30%	20%
69	0%	0%	20%	20%	0%	0%	20%	20%	20%
70	0%	0%	20%	20%	0%	0%	20%	20%	20%
71	0%	0%	20%	20%	0%	0%	20%	20%	20%
72	0%	0%	20%	20%	0%	0%	20%	20%	20%
73	0%	0%	20%	20%	0%	0%	20%	20%	20%
74	0%	0%	20%	20%	0%	0%	20%	20%	20%
75	0%	0%	100%	100%	0%	0%	100%	100%	100%

* Retirement rate 35% at the later of age 62 or their 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 on or after age 65.

b. Assumed rates of disability are shown in the following table. Ten percent of disabilities are assumed to be duty-related.

Disability Rates				
Age	General Employees		Teachers	
	Males	Females	Males	Females
25	0.0340%	0.0290%	0.0160%	0.0182%
30	0.0680%	0.0406%	0.0240%	0.0245%
35	0.1020%	0.0812%	0.0320%	0.0245%
40	0.1700%	0.1044%	0.0600%	0.0427%
45	0.2380%	0.1508%	0.1000%	0.0875%
50	0.3400%	0.2552%	0.1600%	0.1400%
55	0.5440%	0.4060%	0.2600%	0.2275%
60	0.6800%	0.6206%	0.4000%	0.3500%
64	0.8500%	0.8642%	0.5000%	0.4375%

c. Active Member Mortality

Rates of active member mortality are based upon the amount-weighted PUB-2010 Public Retirement Plans Mortality Table for Safety 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	0.0378%	0.0122%	0.0208%	0.0099%
30	0.0486%	0.0203%	0.0286%	0.0154%
35	0.0635%	0.0311%	0.0390%	0.0220%
40	0.0891%	0.0486%	0.0546%	0.0341%
45	0.1323%	0.0756%	0.0871%	0.0528%
50	0.2012%	0.1121%	0.1443%	0.0803%
55	0.2957%	0.1661%	0.2236%	0.1177%
60	0.4307%	0.2511%	0.3432%	0.1771%
64	0.5846%	0.3632%	0.5096%	0.2662%
Multiplier	135%	135%	130%	110%

* For purpose of determining active death benefits, 5% of active deaths of general employees and teachers are assumed to be duty related.

d. Rates of Withdrawal

1). For the first 10 years of service for general employees/11 years of service for teachers, rates are developed for each employee group and differ by gender and service. Sample rates are shown in the tables below.

Years of Service	SCRS - General Employees		SCRS - Teachers	
	Male	Female	Male	Female
1	0.2200	0.2600	0.0000	0.0000
2	0.1800	0.2200	0.2200	0.2400
3	0.1300	0.1500	0.1700	0.1400
4	0.1000	0.1200	0.1200	0.1100
5	0.0900	0.1000	0.1000	0.0900
6	0.0850	0.0900	0.0900	0.0750
7	0.0800	0.0800	0.0800	0.0700
8	0.0700	0.0700	0.0700	0.0600
9	0.0600	0.0600	0.0600	0.0550
10	0.0550	0.0550	0.0500	0.0500
11	0.0538	0.0544	0.0500	0.0450

2). After the first 10 years of service for general employees/11 years of service for teachers, termination rates vary by employee group, gender and by the number of years remaining until first retirement eligibility. Sample rates are shown in the tables below.

Years from Retirement	SCRS - General Employees		SCRS - Teachers	
	Male	Female	Male	Female
1	0.0090	0.0100	0.0080	0.0080
2	0.0100	0.0100	0.0090	0.0080
3	0.0110	0.0100	0.0100	0.0080
4	0.0120	0.0110	0.0110	0.0090
5	0.0130	0.0120	0.0120	0.0090
6	0.0150	0.0140	0.0140	0.0100
7	0.0170	0.0160	0.0160	0.0110
8	0.0190	0.0190	0.0170	0.0120
9	0.0200	0.0210	0.0180	0.0140
10	0.0220	0.0240	0.0200	0.0160
11	0.0260	0.0270	0.0220	0.0180
12	0.0290	0.0300	0.0240	0.0200
13	0.0320	0.0340	0.0260	0.0220
14	0.0340	0.0380	0.0270	0.0240
15	0.0370	0.0420	0.0290	0.0280
16	0.0390	0.0450	0.0310	0.0310
17	0.0420	0.0480	0.0350	0.0340
18	0.0430	0.0490	0.0360	0.0350
19	0.0442	0.0496	0.0374	0.0360
20	0.0454	0.0502	0.0388	0.0370
21	0.0466	0.0508	0.0402	0.0380
22	0.0478	0.0514	0.0416	0.0390
23	0.0490	0.0520	0.0430	0.0400
24	0.0502	0.0526	0.0444	0.0410
25	0.0514	0.0532	0.0458	0.0420
26	0.0526	0.0538	0.0472	0.0430
27	0.0538	0.0544	0.0486	0.0440
28+	0.0000	0.0000	0.0000	0.0000

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:	less than 40	40 - 49	50 and Over
Refund Rate:	45%	40%	35%

Post Retirement Mortality

a. Healthy retirees and beneficiaries – The gender-distinct South Carolina Retirees 2020 Mortality Tables. The rates are projected on a fully generational basis by the 80% of Scale UMP to account for future mortality improvements and adjusted 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	0.1920%	0.2192%	0.1880%	0.1926%
55	0.3243%	0.2824%	0.3176%	0.2481%
60	0.5751%	0.3863%	0.5633%	0.3393%
65	0.8761%	0.5616%	0.8580%	0.4934%
70	1.4502%	0.9097%	1.4203%	0.7992%
75	2.5442%	1.7869%	2.4918%	1.5698%
80	4.7175%	3.5220%	4.6202%	3.0941%
85	8.5346%	6.8204%	8.3587%	5.9917%
90	14.9914%	12.8871%	14.6823%	11.3214%
Multiplier	97%	107%	95%	94%

The life expectancies for a 65 year old retiree in future years based on the assumption with full generational projection are shown as follows:

Life Expectancy for an Age 65 Retiree In Years					
Employee Type / Gender	Year of Retirement				
	2020	2025	2030	2035	2040
General Employee - Male	20.9	21.2	21.5	21.8	22.1
General Employee - Female	23.0	23.3	23.6	23.9	24.2
Teacher - Male	21.1	21.4	21.7	22.0	22.3
Teacher - Female	24.0	24.3	24.6	24.9	25.2

b. A separate table of mortality rates is used for disabled retirees based on the Pub-2010 Public Retirement Plans Disabled Mortality tables on a fully generational basis by 80% of Scale UMP to account for future mortality and with multipliers based on plan experience. The following are sample rates of the base table:

Disabled Annuitant Mortality Rates Before Projection (Multiplier Applied)				
Age	General Employees		Teachers	
	Males	Females	Males	Females
50	2.2470%	1.9279%	2.0865%	1.7796%
55	2.9596%	2.2646%	2.7482%	2.0904%
60	3.5042%	2.5428%	3.2539%	2.3472%
65	4.2616%	2.9328%	3.9572%	2.7072%
70	5.4614%	3.7206%	5.0713%	3.4344%
75	7.2688%	5.2039%	6.7496%	4.8036%
80	10.2872%	7.8091%	9.5524%	7.2084%
85	15.1410%	12.1303%	14.0595%	11.1972%
90	22.7542%	17.7645%	21.1289%	16.3980%
Multiplier	140%	130%	130%	120%

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for a five-year phase in of the actual investment return in excess of (or less than) expected investment return on a market value of asset basis. 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 contribution rate is set by statute for both employees and employers. The funding period is determined, as described below, using the Entry Age Normal actuarial cost method. The Entry Age Normal actuarial cost method allocates the plan'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 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 scheduled increases to contribution rates applicable to future years and payroll growth. Also, the calculation of the actuarial determined contribution rate and amortization period reflects additional contributions the System receives with respect to ORP participants and return to work retirees. 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.

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 on Annual Final Compensation, liabilities for active members are increased 2.14%.

Unused Sick Leave

To account for the effect of unused sick leave on members' final 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 Cost-of-living Increases

Benefits are assumed to increase 1% 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 the future years.

Payroll Growth Rate

The total annual payroll of active members (also applies to ORP and rehired retiree participants) is assumed to increase at an annual rate of 2.70%. This rate represents the underlying expected annual rate of wage inflation and does not anticipate increases in the number of members. The number of rehired retirees is expected to decrease over the next 7 years, then remain constant to reflect the pension reform legislation enacted in 2012.

Other Assumptions

1. The normal cost rate is increased by 0.18% to account for administrative expenses that are paid with plan assets.

2. 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 seperately for return to work employees by dividing the actual member contributions received during the prior fiscal year by the applicable member contribution rate and rolled-forward one year with the payroll growth assumption.

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 members are assumed to be married.

6. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger 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. No surviving spouse will remarry and there will be no children's benefit.

11. 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.

12. 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.

13. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

14. 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.

15. Benefit Service: All members are assumed to accrue 1 year of eligibility service each year.

16. 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 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 birthdate, 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, bad, or inconsistent data. These had no material impact on the results presented.

SECTION VI

SUMMARY OF NEW ASSUMPTIONS (PORS)

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 7.00% net of investment and administrative expenses composed of a 2.25% inflation component and a 4.75% 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 21 years of service to include anticipated merit and promotional increases. The assumed annual rate of increase is 3.50% for all members with 22 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	7.00%	10.50%
2	6.00%	9.50%
3	3.25%	6.75%
4	1.75%	5.25%
5	1.50%	5.00%
6	1.25%	4.75%
7	1.25%	4.75%
8	1.00%	4.50%
9	1.00%	4.50%
10 - 13	0.75%	4.25%
14	0.50%	4.00%
15 - 21	0.25%	3.75%
22+	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 for Class Three). The second table is based on service and is for members who attain 25 years of service (Class Two)/27 years of service (Class Three) before age 55.

Annual Age Based Retirement Rates		
Age	PORS	
	Male	Female
55	20%	20%
56	20%	20%
57	20%	20%
58	12%	12%
59	12%	12%
60	12%	12%
61	25%	25%
62	25%	25%
63	25%	25%
64	25%	25%
65	25%	25%
66	25%	25%
67	25%	25%
68	25%	25%
69	25%	25%
70 & Over	100%	100%

Annual Service Based Retirement Rates			
Years of Service		PORS	
Class Two	Class Three	Male	Female
25	27	30%	30%
26	28	14%	14%
27	29	14%	14%
28	30	14%	14%
29	31	14%	14%
30	32	14%	14%
31	33	14%	14%
32	34	14%	14%
33	35	14%	14%
34	36	14%	14%
35	37	14%	14%
36	38	14%	14%
37	39	14%	14%
38	40	14%	14%
39	41	14%	14%
40	42	100%	100%

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

c. Active Member Mortality

Rates of active member mortality are based upon the amount-weighted PUB-2010 Public Retirement Plans Mortality Table for Safety 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	0.0370%	0.0200%
30	0.0410%	0.0270%
35	0.0470%	0.0360%
40	0.0590%	0.0490%
45	0.0820%	0.0670%
50	0.1200%	0.0910%
55	0.1750%	0.1230%
60	0.2640%	0.1680%
64	0.3750%	0.2150%
Multiplier	100%	100%

For purposes of determining active death benefits, 10% of active deaths are assumed to be duty related.

d. Rates of Withdrawal

Rates are developed for each employee group and differ by service. Sample rates are shown in the tables below.

Annual Withdrawal Rate		
Years of Service	PORS	
	Male	Female
1	0.2500	0.2500
2	0.1800	0.1800
3	0.1400	0.1400
4	0.1200	0.1200
5	0.1070	0.1070
6	0.0954	0.0954
7	0.0850	0.0850
8	0.0758	0.0758
9	0.0675	0.0675
10	0.0602	0.0602
11	0.0537	0.0537
12	0.0478	0.0478
13	0.0426	0.0426
14	0.0380	0.0380
15	0.0339	0.0339
16	0.0302	0.0302
17	0.0269	0.0269
18	0.0240	0.0240
19	0.0214	0.0214
20	0.0191	0.0191
21	0.0170	0.0170
22	0.0151	0.0151
23	0.0135	0.0135
24	0.0120	0.0120
25	0.0105	0.0105
26	0.0090	0.0090
27+	0.0000	0.0000

Post Retirement Mortality

a. Healthy retirees and beneficiaries – The gender-distinct South Carolina Retirees 2020 Mortality Tables. The rates are projected on a fully generational basis by the 80% of Scale UMP to account for future mortality improvements and adjusted with multipliers based on plan experience. The following are sample rates of the base table:

Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	PORS	
	Males	Females
50	0.2513%	0.2192%
55	0.4246%	0.2824%
60	0.7530%	0.3863%
65	1.1471%	0.5616%
70	1.8988%	0.9097%
75	3.3311%	1.7869%
80	6.1765%	3.5220%
85	11.1742%	6.8204%
90	19.6279%	12.8871%
Multiplier	127%	107%

The life expectancies for a 65 year old retiree in future years based on the assumption with full generational projection are shown as follows:

Life Expectancy for an Age 65 Retiree In Years					
Gender	Year of Retirement				
	2020	2025	2030	2035	2040
Male	18.8	19.1	19.4	19.7	20.0
Female	23.0	23.3	23.6	23.9	24.2

b. A separate table of mortality rates is used for disabled retirees based on the Pub-2010 Public Retirement Plans Disabled Mortality tables on a fully generational basis by 80% of Scale UMP to account for future mortality and with multipliers based on plan experience. The following are sample rates of the base table:

Disabled Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	PORS	
	Males	Females
50	1.6050%	1.4830%
55	2.1140%	1.7420%
60	2.5030%	1.9560%
65	3.0440%	2.2560%
70	3.9010%	2.8620%
75	5.1920%	4.0030%
80	7.3480%	6.0070%
85	10.8150%	9.3310%
90	16.2530%	13.6650%
Multiplier	100%	100%

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for a five-year phase in of the actual investment return in excess of (or less than) expected investment return on a market value of asset basis. 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 contribution rate is set by statute for both employees and employers. The funding period is determined, as described below, using the Entry Age Normal actuarial cost method. The Entry Age Normal actuarial cost method allocates the plan'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 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 scheduled increases to contribution rates applicable to future years and payroll growth. Also, the calculation of the actuarial determined contribution rate and amortization period reflects additional contributions the System receives with respect to return to work retirees. 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.

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 on Annual Final Compensation, liabilities for active members are increased 3.75%.

Unused Sick Leave

To account for the effect of unused sick leave on members' final 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 Cost-of-living Increases

Benefits are assumed to increase 1% 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 the future years.

Payroll Growth Rate

The total annual payroll of active members (also applies to rehired retiree participants) is assumed to increase at an annual rate of 2.70%. This rate represents the underlying expected annual rate of wage inflation and does not anticipate increases in the number of members. The number rehired retirees is expected to decrease over the next 7 years, then remain constant to reflect the pension reform legislation enacted in 2012.

Other Assumptions

1. The normal cost rate is increased by 0.18% to reflect administrative expenses that are paid with plan assets.

2. 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 seperately 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 and rolled-forward one year with the payroll growth assumption.

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: Male members are assumed to be four years older than their spouses, and female members are assumed to be four years younger 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. Vested members are assumed to take a deferred retirement benefit.

9. There will be no recoveries once disabled.

10. No surviving spouse will remarry and there will be no children's benefit.

11. Decrement timing: Decrements of all types are assumed to occur mid-year.

12. 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.

13. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

14. 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.

15. Benefit Service: All members are assumed to accrue 1 year of eligibility service each year.

16. All calculations were performed without regard to the compensation limit in IRC Section 401(a)(17) and the benefit limit under IRC Section 415.

17. Refund of Member Contributions: Members will refund their contributions if the value of their member contributions exceeds the value of their deferred monthly retirement benefit

Participant Data

Participant data was 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 birthdate, 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, bad, or inconsistent data. These had no material impact on the results presented.

SECTION VII

SUMMARY OF NEW ASSUMPTIONS (JSRS)

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 Judges and Solicitors of South Carolina.

Investment Rate of Return

Assumed annual rate of 7.00% net of investment and administrative expenses composed of a 2.25% inflation component and a 4.75% 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 salary are assumed to increase at an annual rate of 3.00%.

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	20%	20%
16	20%	20%
17	20%	20%
18	20%	20%
19	20%	20%
20	50%	50%
21	15%	15%
22	15%	15%
23	15%	15%
24	15%	15%
25	10%	10%
26	10%	10%
27	10%	10%
28	10%	10%
29	10%	10%
30	10%	10%
31*	10%	10%
32+	100%	100%

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

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

JSRS				
Age	Disability Rates		Active Mortality Rates (multiplier added)	
	Males	Females	Males	Females
25	0.0160%	0.0182%	0.0208%	0.0099%
30	0.0240%	0.0245%	0.0286%	0.0154%
35	0.0320%	0.0245%	0.0390%	0.0220%
40	0.0600%	0.0427%	0.0546%	0.0341%
45	0.1000%	0.0875%	0.0871%	0.0528%
50	0.1600%	0.1400%	0.1443%	0.0803%
55	0.2600%	0.2275%	0.2236%	0.1177%
60	0.4000%	0.3500%	0.3432%	0.1771%
64	0.5000%	0.4375%	0.5096%	0.2662%

Post Retirement Mortality

a. Healthy retirees and beneficiaries – The gender-distinct South Carolina Retirees 2020 Mortality Tables. The rates are projected on a fully generational basis by the 80% of Scale UMP to account for future mortality improvements and adjusted with multipliers based on plan experience. The following are sample rates of the base table:

Nondisabled Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	JSRS	
	Males	Females
50	0.1880%	0.1926%
55	0.3176%	0.2481%
60	0.5633%	0.3393%
65	0.8580%	0.4934%
70	1.4203%	0.7992%
75	2.4918%	1.5698%
80	4.6202%	3.0941%
85	8.3587%	5.9917%
90	14.6823%	11.3214%
Multiplier	95%	94%

The life expectancies for a 65 year old retiree in future years based on the assumption with full generational projection are shown as follows:

Life Expectancy for an Age 65 Retiree In Years					
Gender	Year of Retirement				
	2020	2025	2030	2035	2040
Male	21.1	21.4	21.7	22.0	22.3
Female	24.0	24.3	24.6	24.9	25.2

b. A separate table of mortality rates is used for disabled retirees based on the Pub-2010 Public Retirement Plans Disabled Mortality tables on a fully generational basis by 80% of Scale UMP to account for future mortality and with multipliers based on plan experience. The following are sample rates of the base table:

Disabled Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	JSRS	
	Males	Females
50	2.0865%	1.7796%
55	2.7482%	2.0904%
60	3.2539%	2.3472%
65	3.9572%	2.7072%
70	5.0713%	3.4344%
75	6.7496%	4.8036%
80	9.5524%	7.2084%
85	14.0595%	11.1972%
90	21.1289%	16.3980%
Multiplier	130%	120%

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for a five-year phase in of the actual investment return in excess of (or less than) expected investment return on a market value of asset basis. 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 scheduled increases to contribution requirements applicable to future years and payroll growth. 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 3.00%.

Payroll Growth Rate

The total annual payroll of active members (including DROP and RIP participants) is assumed to increase at an annual rate of 2.70%. 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 0.18% 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 eligibility service each year.

Participant Data

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

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

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

SECTION VIII

SUMMARY OF NEW ASSUMPTIONS (GARS)

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 7.00% net of investment and administrative expenses composed of a 2.25% inflation component and a 4.75% 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.

Annual Age Based Retirement Rates	
Age	**Assumed Rate**
59 & Under	50%
60	20%
61 - 64	7%
65 - 69	10%
70 & Older	100%

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

GARS				
Age	**Disability Rates**		**Active Mortality Rates (multiplier applied)**	
	Males	**Females**	**Males**	**Females**
25	0.0340%	0.0290%	0.0378%	0.0122%
30	0.0680%	0.0406%	0.0486%	0.0203%
35	0.1020%	0.0812%	0.0635%	0.0311%
40	0.1700%	0.1044%	0.0891%	0.0486%
45	0.2380%	0.1508%	0.1323%	0.0756%
50	0.3400%	0.2552%	0.2012%	0.1121%
55	0.5440%	0.4060%	0.2957%	0.1661%
60	0.6800%	0.6206%	0.4307%	0.2511%
64	0.8500%	0.8642%	0.5846%	0.3632%

Post Retirement Mortality

c. Healthy retirees and beneficiaries – The gender-distinct South Carolina Retirees 2020 Mortality Tables. The rates are projected on a fully generational basis by the 80% of Scale UMP to account for future mortality improvements and adjusted with multipliers based on plan experience. The following are sample rates of the base table:

Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	GARS	
	Males	Females
50	0.1920%	0.2192%
55	0.3243%	0.2824%
60	0.5751%	0.3863%
65	0.8761%	0.5616%
70	1.4502%	0.9097%
75	2.5442%	1.7869%
80	4.7175%	3.5220%
85	8.5346%	6.8204%
90	14.9914%	12.8871%
Multiplier	97%	107%

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	2040
Male	20.9	21.2	21.5	21.8	22.1
Female	23.0	23.3	23.6	23.9	24.2

A separate table of mortality rates is used for disabled retirees based on the Pub-2010 Public Retirement Plans Disabled Mortality tables on a fully generational basis by 80% of Scale UMP to account for future mortality and with multipliers based on plan experience. The following are sample rates of the base table:

Disabled Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	GARS	
	Males	Females
50	2.2470%	1.9279%
55	2.9596%	2.2646%
60	3.5042%	2.5428%
65	4.2616%	2.9328%
70	5.4614%	3.7206%
75	7.2688%	5.2039%
80	10.2872%	7.8091%
85	15.1410%	12.1303%
90	22.7542%	17.7645%
Multiplier	140%	130%

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for a five-year phase in of the actual investment return in excess of (or less than) expected investment return on a market value of asset basis. 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 0.18% 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 eligibility service each year.

Participant Data

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

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

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

SECTION IX

SUMMARY OF NEW ASSUMPTIONS (SCNG)

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 7.00% net of investment and administrative expenses composed of a 2.25% inflation component and a 4.75% 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. 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			
	Service		
Age	20	21 - 29	30+
Age < 60	10%	5%	100%
Age >= 60	100%	100%	100%

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

SCNG				
Age	Disability Rates (multiplier added)		Active Mortality Rates (multiplier added)	
	Males	Females	Males	Females
25	0.1740%	0.1740%	0.0370%	0.0200%
30	0.2320%	0.2320%	0.0410%	0.0270%
35	0.4350%	0.4350%	0.0470%	0.0360%
40	0.5800%	0.5800%	0.0590%	0.0490%
45	0.8700%	0.8700%	0.0820%	0.0670%
50	1.0875%	1.0875%	0.1200%	0.0910%
55	0.0000%	0.0000%	0.1750%	0.1230%
60	0.0000%	0.0000%	0.2640%	0.1680%
64	0.0000%	0.0000%	0.3750%	0.2150%

Post Retirement Mortality

Healthy retirees and beneficiaries – The gender-distinct South Carolina Retirees 2020 Mortality Tables. The rates are projected on a fully generational basis by the 80% of Scale UMP to account for future mortality improvements and adjusted with multipliers based on plan experience. The following are sample rates of the base table:

Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	SCNG	
	Males	Females
50	0.2513%	0.2192%
55	0.4246%	0.2824%
60	0.7530%	0.3863%
65	1.1471%	0.5616%
70	1.8988%	0.9097%
75	3.3311%	1.7869%
80	6.1765%	3.5220%
85	11.1742%	6.8204%
90	19.6279%	12.8871%
Multiplier	127%	107%

The life expectancies for a 65 year old retiree in future years based on the assumption with full generational projection are shown as follows:

Life Expectancy for an Age 65 Retiree In Years					
Gender	Year of Retirement				
	2020	2025	2030	2035	2040
Male	18.8	19.1	19.4	19.7	20.0
Female	23.0	23.3	23.6	23.9	24.2

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for a five-year phase in of the actual investment return in excess of (or less than) expected investment return on a market value of asset basis. 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 reflect administrative expenses that are paid with plan assets.

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.

SECTION X

SUMMARY OF DATA AND EXPERIENCE

List of Tables

List of Tables (Continued)

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
SALARY INCREASE EXPERIENCE

	Current Salary Scale		2009/2019 Actual Experience			Proposed Salary Scale	
Years of Service	Total	Step Rate/ Promotional	Total	Above Inflation	Step Rate/ Promotional	Total	Step Rate/ Promotional
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	7.00%	4.00%	13.44%	11.71%	10.72%	9.50%	6.50%
2	6.00%	3.00%	7.58%	5.85%	4.85%	7.00%	4.00%
3	5.25%	2.25%	4.82%	3.09%	2.09%	5.25%	2.25%
4	4.75%	1.75%	4.25%	2.52%	1.52%	4.75%	1.75%
5	4.50%	1.50%	3.96%	2.22%	1.23%	4.50%	1.50%
6	4.25%	1.25%	3.68%	1.94%	0.95%	4.25%	1.25%
7	4.00%	1.00%	3.71%	1.98%	0.98%	4.25%	1.25%
8	4.00%	1.00%	3.64%	1.90%	0.91%	4.00%	1.00%
9	4.00%	1.00%	3.49%	1.76%	0.77%	4.00%	1.00%
10	3.75%	0.75%	3.20%	1.47%	0.47%	3.75%	0.75%
11	3.50%	0.50%	3.20%	1.47%	0.48%	3.75%	0.75%
12	3.50%	0.50%	3.13%	1.39%	0.40%	3.50%	0.50%
13	3.50%	0.50%	3.08%	1.34%	0.35%	3.50%	0.50%
14	3.50%	0.50%	3.00%	1.26%	0.27%	3.50%	0.50%
15	3.50%	0.50%	3.03%	1.29%	0.30%	3.50%	0.50%
16	3.50%	0.50%	2.93%	1.19%	0.20%	3.50%	0.50%
17	3.50%	0.50%	2.97%	1.24%	0.25%	3.50%	0.50%
18	3.50%	0.50%	2.84%	1.11%	0.11%	3.50%	0.50%
19	3.25%	0.25%	2.71%	0.98%	-0.01%	3.25%	0.25%
20	3.25%	0.25%	2.68%	0.95%	-0.05%	3.25%	0.25%
21+	3.00%	0.00%	2.73%	0.99%	0.00%	3.00%	0.00%

Current Inflation Assumption	2.25%	Proposed Inflation Assumption	2.25%
Current Productivity Component	0.75%	Proposed Productivity Component	0.75%
Actual CPI-U Inflation for Jun/09 - Jun/19	1.73%	Proposed Wage Inflation	3.00%
Apparent Productivity Component	0.99%		

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
SALARY INCREASE EXPERIENCE

	Current Salary Scale		2009/2019 Actual Experience			Proposed Salary Scale	
Years of Service	Total	Step Rate/ Promotional	Total	Above Inflation	Step Rate/ Promotional	Total	Step Rate/ Promotional
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	10.00%	7.00%	16.80%	15.06%	14.63%	11.00%	8.00%
2	12.50%	9.50%	12.86%	11.13%	10.70%	10.75%	7.75%
3	6.00%	3.00%	5.76%	4.03%	3.60%	6.50%	3.50%
4	5.75%	2.75%	4.69%	2.96%	2.52%	5.50%	2.50%
5	5.50%	2.50%	4.42%	2.69%	2.26%	5.25%	2.25%
6	5.25%	2.25%	4.21%	2.48%	2.05%	5.00%	2.00%
7	5.00%	2.00%	4.15%	2.42%	1.99%	4.75%	1.75%
8	4.75%	1.75%	3.96%	2.22%	1.79%	4.50%	1.50%
9	4.75%	1.75%	3.79%	2.05%	1.62%	4.50%	1.50%
10	4.50%	1.50%	3.58%	1.85%	1.42%	4.25%	1.25%
11	4.50%	1.50%	3.55%	1.82%	1.39%	4.25%	1.25%
12	4.25%	1.25%	3.29%	1.56%	1.13%	4.00%	1.00%
13	4.00%	1.00%	3.14%	1.41%	0.98%	3.75%	0.75%
14	4.00%	1.00%	3.03%	1.30%	0.87%	3.75%	0.75%
15	3.75%	0.75%	2.98%	1.25%	0.82%	3.50%	0.50%
16	3.75%	0.75%	2.91%	1.18%	0.75%	3.50%	0.50%
17	3.50%	0.50%	2.85%	1.12%	0.69%	3.25%	0.25%
18	3.50%	0.50%	2.75%	1.02%	0.59%	3.25%	0.25%
19	3.25%	0.25%	2.71%	0.98%	0.55%	3.25%	0.25%
20	3.25%	0.25%	2.55%	0.81%	0.38%	3.25%	0.25%
21+	3.00%	0.00%	2.17%	0.43%	0.00%	3.00%	0.00%

Current Inflation Assumption	2.25%
Current Productivity Component	0.75%
Actual CPI-U Inflation for Jun/09 - Jun/19	1.73%
Apparent Productivity Component	0.43%

Proposed Inflation Assumption	2.25%
Proposed Productivity Component	0.75%
Proposed Wage Inflation	3.00%

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
SALARY INCREASE EXPERIENCE

	Current Salary Scale		2005/2015 Actual Experience			Proposed Salary Scale	
Years of Service	Total	Step Rate/ Promotional	Total	Above Inflation	Step Rate/ Promotional	Total	Step Rate/ Promotional
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	9.50%	6.00%	16.37%	14.64%	13.23%	10.50%	7.00%
2	9.00%	5.50%	11.17%	9.44%	8.02%	9.50%	6.00%
3	6.50%	3.00%	6.41%	4.68%	3.26%	6.75%	3.25%
4	5.00%	1.50%	5.05%	3.32%	1.90%	5.25%	1.75%
5	4.75%	1.25%	4.87%	3.13%	1.72%	5.00%	1.50%
6	4.50%	1.00%	4.63%	2.90%	1.49%	4.75%	1.25%
7	4.50%	1.00%	4.65%	2.92%	1.51%	4.75%	1.25%
8	4.25%	0.75%	4.29%	2.55%	1.14%	4.50%	1.00%
9	4.25%	0.75%	4.60%	2.87%	1.46%	4.50%	1.00%
10	4.00%	0.50%	4.11%	2.37%	0.96%	4.25%	0.75%
11	4.00%	0.50%	4.01%	2.27%	0.86%	4.25%	0.75%
12	4.00%	0.50%	4.10%	2.37%	0.96%	4.25%	0.75%
13	4.00%	0.50%	3.90%	2.17%	0.75%	4.25%	0.75%
14	3.75%	0.25%	3.60%	1.87%	0.46%	4.00%	0.50%
15	3.50%	0.00%	3.94%	2.20%	0.79%	3.75%	0.25%
16	3.50%	0.00%	3.60%	1.86%	0.45%	3.75%	0.25%
17	3.50%	0.00%	3.53%	1.79%	0.38%	3.75%	0.25%
18	3.50%	0.00%	3.66%	1.92%	0.51%	3.75%	0.25%
19	3.50%	0.00%	3.47%	1.73%	0.32%	3.75%	0.25%
20	3.50%	0.00%	3.51%	1.78%	0.37%	3.75%	0.25%
21	3.50%	0.00%	3.76%	2.02%	0.61%	3.75%	0.25%
22+	3.50%	0.00%	3.16%	1.42%	0.01%	3.50%	0.00%

Current Inflation Assumption	2.25%	Proposed Inflation Assumption	2.25%
Current Productivity Component	1.25%	Proposed Productivity Component	1.25%
Actual CPI-U Inflation for Jun/09 - Jun/19	1.73%	Proposed Wage Inflation	3.50%
Apparent Productivity Component	1.41%		

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - MALE

Age	Actual Deaths	Total Exposures	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45-49	$ 66	$ 25,551	0.0026	0.13%	0.16%	$ 33	$ 42	199%	160%
50-54	610	151,416	0.0040	0.24%	0.26%	367	397	166%	154%
55-59	1,850	381,299	0.0049	0.42%	0.43%	1,599	1,649	116%	112%
60-64	5,085	701,107	0.0073	0.72%	0.72%	5,075	5,047	100%	101%
65-69	11,563	1,014,390	0.0114	1.17%	1.13%	11,893	11,449	97%	101%
70-74	14,295	826,211	0.0173	1.86%	1.87%	15,344	15,427	93%	93%
75-79	18,136	538,944	0.0337	3.32%	3.39%	17,897	18,276	101%	99%
80-84	20,608	333,580	0.0618	6.10%	6.17%	20,361	20,584	101%	100%
85-89	17,581	164,845	0.1067	10.67%	10.75%	17,590	17,724	100%	99%
90-94	11,306	60,414	0.1871	17.91%	18.29%	10,818	11,053	105%	102%
95-99	3,988	13,226	0.3016	28.00%	28.07%	3,704	3,712	108%	107%
100-104	461	1,149	0.4015	40.59%	40.61%	466	467	99%	99%
105-109	40	46	0.8779	47.50%	48.50%	22	22	185%	181%
Total	$ 105,591	$ 4,212,178				$ 105,170	$ 105,847	100%	100%

($ in thousands of benefit)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - FEMALE

Age	Actual Deaths	Total Exposures	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45-49	$ 25	$ 15,283	0.0016	0.10%	0.15%	$ 16	$ 23	158%	109%
50-54	353	162,501	0.0022	0.19%	0.26%	311	425	114%	83%
55-59	1,721	480,103	0.0036	0.34%	0.33%	1,617	1,605	106%	107%
60-64	3,736	876,802	0.0043	0.48%	0.46%	4,201	4,009	89%	93%
65-69	7,249	1,022,676	0.0071	0.72%	0.70%	7,335	7,171	99%	101%
70-74	8,360	702,015	0.0119	1.23%	1.21%	8,640	8,495	97%	98%
75-79	9,538	397,840	0.0240	2.44%	2.39%	9,705	9,502	98%	100%
80-84	10,355	225,923	0.0458	4.81%	4.77%	10,873	10,766	95%	96%
85-89	12,112	126,750	0.0956	8.76%	9.12%	11,097	11,559	109%	105%
90-94	9,141	55,656	0.1642	14.65%	15.82%	8,151	8,805	112%	104%
95-99	3,351	12,241	0.2738	23.11%	24.91%	2,830	3,050	118%	110%
100-104	483	1,346	0.3587	34.70%	38.15%	467	514	103%	94%
105-109	106	212	0.4998	49.49%	52.54%	105	112	101%	95%
Total	$ 66,532	$ 4,079,349				$ 65,347	$ 66,034	102%	101%

($ in thousands of benefit)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45-49	$ 9	$ 3,444	0.0026	0.13%	0.16%	$ 4	$ 6	202%	161%
50-54	111	53,569	0.0021	0.24%	0.27%	129	142	86%	78%
55-59	974	180,595	0.0054	0.41%	0.42%	733	765	133%	127%
60-64	1,702	329,871	0.0052	0.70%	0.70%	2,312	2,325	74%	73%
65-69	5,240	463,953	0.0113	1.13%	1.10%	5,253	5,111	100%	103%
70-74	5,962	333,367	0.0179	1.79%	1.82%	5,954	6,051	100%	99%
75-79	6,246	191,369	0.0326	3.21%	3.31%	6,140	6,341	102%	98%
80-84	7,613	118,501	0.0642	5.91%	6.04%	7,000	7,157	109%	106%
85-89	6,477	62,932	0.1029	10.32%	10.52%	6,494	6,618	100%	98%
90-94	4,000	23,080	0.1733	17.24%	17.82%	3,979	4,113	101%	97%
95-99	1,452	4,782	0.3037	26.47%	26.89%	1,266	1,286	115%	113%
100-104	135	379	0.3561	40.06%	40.67%	152	154	89%	88%
105-109	41	64	0.6411	46.00%	47.50%	30	31	139%	135%
Totals	$ 39,963	$ 1,765,906				$ 39,444	$ 40,099	101%	100%

($ in thousands of benefit)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45-49	$ 1	$ 7,119	0.0002	0.09%	0.00%	$ 7	$ 0	22%	0%
50-54	285	255,645	0.0011	0.17%	0.23%	440	593	65%	48%
55-59	2,006	832,376	0.0024	0.30%	0.29%	2,465	2,440	81%	82%
60-64	6,139	1,473,942	0.0042	0.42%	0.40%	6,234	5,920	98%	104%
65-69	9,933	1,649,957	0.0060	0.63%	0.61%	10,408	10,125	95%	98%
70-74	10,666	1,008,736	0.0106	1.08%	1.06%	10,892	10,655	98%	100%
75-79	11,291	542,669	0.0208	2.16%	2.10%	11,721	11,419	96%	99%
80-84	15,363	355,914	0.0432	4.30%	4.24%	15,308	15,099	100%	102%
85-89	19,404	239,291	0.0811	7.76%	8.05%	18,575	19,263	104%	101%
90-94	15,832	111,897	0.1415	13.03%	14.01%	14,582	15,678	109%	101%
95-99	7,449	31,137	0.2392	20.46%	21.94%	6,370	6,832	117%	109%
100-104	1,411	4,461	0.3164	31.13%	34.09%	1,389	1,521	102%	93%
105-109	154	523	0.2937	44.34%	46.21%	232	242	66%	64%
Total	$ 99,935	$ 6,513,668				$ 98,623	$ 99,787	101%	100%

($ in thousands of benefit)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
POST-RETIREMENT MORTALITY EXPERIENCE - MALE

Age	Actual Deaths	Total Exposures	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45-49	$ 53	$ 85,157	0.0006	0.17%	0.21%	$ 141	$ 175	38%	30%
50-54	846	204,029	0.0041	0.31%	0.33%	626	675	135%	125%
55-59	1,147	270,453	0.0042	0.54%	0.56%	1,454	1,506	79%	76%
60-64	2,685	310,473	0.0086	0.93%	0.92%	2,875	2,869	93%	94%
65-69	4,499	294,642	0.0153	1.52%	1.46%	4,486	4,305	100%	104%
70-74	5,256	186,513	0.0282	2.41%	2.42%	4,489	4,511	117%	117%
75-79	4,726	106,587	0.0443	4.36%	4.44%	4,643	4,732	102%	100%
80-84	4,817	59,620	0.0808	7.94%	7.98%	4,734	4,756	102%	101%
85-89	3,458	23,772	0.1455	13.94%	13.93%	3,314	3,311	104%	104%
90-94	1,605	7,051	0.2277	23.43%	23.68%	1,652	1,669	97%	96%
95-99	317	920	0.3446	35.63%	35.36%	328	325	97%	97%
100-104	-	-	N\A	N\A	N\A	-	-	0%	0%
105-109	-	6	0.0000	62.68%	63.50%	4	4	0%	0%
Totals	$ 29,408	$ 1,549,224				$ 28,746	$ 28,840	102%	102%

($ in thousands of benefit)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - DISABLED MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	31	1,564	0.0198	2.70%	2.43%	43	38	73%	81%
55-59	85	2,458	0.0346	3.07%	3.04%	76	75	112%	113%
60-64	117	3,526	0.0332	3.54%	3.57%	126	127	93%	92%
65-69	174	3,517	0.0495	4.33%	4.47%	152	157	115%	111%
70-74	114	1,965	0.0580	5.65%	5.80%	110	113	103%	101%
75-79	83	1,070	0.0776	7.74%	7.90%	82	83	102%	100%
80-84	56	479	0.1169	11.14%	11.43%	52	53	108%	105%
85-89	30	161	0.1863	16.73%	16.84%	27	27	113%	112%
90-94	15	61	0.2459	25.26%	25.64%	15	15	102%	100%
95-99	4	12	0.3333	34.78%	36.32%	4	4	104%	101%
100-104	0	0	N/A	45.04%	49.96%	0	0	0%	0%
105-109	0	0	N/A	56.03%	63.06%	0	0	0%	0%
Total	709	14,813				685	693	104%	102%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - DISABLED FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	45	1,974	0.0228	1.62%	1.97%	32	39	139%	115%
55-59	80	3,343	0.0239	1.93%	2.27%	65	76	123%	105%
60-64	112	4,784	0.0234	2.28%	2.54%	110	122	102%	92%
65-69	139	4,803	0.0289	2.91%	3.04%	140	146	99%	95%
70-74	122	3,122	0.0391	4.07%	4.01%	126	124	97%	98%
75-79	96	1,648	0.0583	6.01%	5.80%	97	94	99%	102%
80-84	59	812	0.0727	8.94%	8.86%	72	71	82%	83%
85-89	49	397	0.1234	13.19%	13.66%	51	53	96%	93%
90-94	23	126	0.1825	19.40%	19.46%	24	24	97%	96%
95-99	11	38	0.2895	28.37%	28.12%	10	10	106%	107%
100-104	1	3	0.3333	39.35%	41.00%	1	1	94%	92%
105-109	0	0	N/A	51.36%	54.38%	0	0	0%	0%
Total	737	21,050				729	761	101%	97%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - DISABLED MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	11	390	0.0282	2.70%	2.25%	11	9	104%	124%
55-59	26	646	0.0402	3.07%	2.82%	20	18	130%	142%
60-64	37	1,086	0.0341	3.54%	3.32%	39	36	95%	102%
65-69	57	1,134	0.0503	4.33%	4.15%	49	47	116%	121%
70-74	41	751	0.0546	5.65%	5.38%	42	40	97%	102%
75-79	33	406	0.0813	7.74%	7.34%	31	29	107%	113%
80-84	17	142	0.1197	11.14%	10.61%	16	15	109%	115%
85-89	9	57	0.1579	16.73%	15.64%	9	9	96%	103%
90-94	10	20	0.5000	25.26%	23.81%	5	5	208%	222%
95-99	0	3	0.0000	34.78%	33.73%	1	1	0%	0%
100-104	0	0	N/A	45.04%	46.39%	0	0	0%	0%
105-109	0	0	N/A	56.03%	58.56%	0	0	0%	0%
Total	241	4,635				222	209	109%	115%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
POST-RETIREMENT MORTALITY EXPERIENCE - DISABLED FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	36	1,583	0.0227	1.62%	1.81%	26	29	139%	124%
55-59	58	2,929	0.0198	1.93%	2.10%	57	62	102%	94%
60-64	105	4,635	0.0227	2.28%	2.35%	107	109	98%	96%
65-69	119	4,937	0.0241	2.91%	2.80%	144	139	83%	86%
70-74	120	3,266	0.0367	4.07%	3.70%	132	120	91%	100%
75-79	73	1,613	0.0453	6.01%	5.35%	95	85	77%	86%
80-84	78	831	0.0939	8.94%	8.18%	73	66	107%	117%
85-89	47	360	0.1306	13.19%	12.61%	46	44	101%	106%
90-94	27	135	0.2000	19.40%	17.97%	26	24	106%	114%
95-99	14	40	0.3500	28.37%	25.95%	11	10	129%	141%
100-104	0	2	0.0000	39.35%	37.84%	1	1	0%	0%
105-109	0	0	N/A	51.36%	50.20%	0	0	0%	0%
Total	677	20,331				717	689	94%	98%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
POST-RETIREMENT MORTALITY EXPERIENCE - DISABLED MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	25	1,838	0.0136	2.70%	1.73%	50	32	50%	79%
55-59	24	1,637	0.0147	3.07%	2.17%	50	35	48%	68%
60-64	26	1,293	0.0201	3.54%	2.55%	46	33	57%	79%
65-69	28	926	0.0302	4.33%	3.20%	40	29	70%	95%
70-74	25	502	0.0498	5.65%	4.14%	28	20	90%	122%
75-79	16	173	0.0925	7.74%	5.64%	13	10	121%	166%
80-84	9	88	0.1023	11.14%	8.16%	10	7	93%	127%
85-89	5	41	0.1220	16.73%	12.03%	7	5	74%	102%
90-94	1	8	0.1250	25.26%	18.31%	2	1	55%	77%
95-99	0	0	N/A	34.78%	25.94%	0	0	0%	0%
100-104	0	0	N/A	45.04%	35.68%	0	0	0%	0%
105-109	0	0	N/A	56.03%	45.04%	0	0	0%	0%
Total	159	6,506				245	173	65%	92%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
POST-RETIREMENT MORTALITY EXPERIENCE - DISABLED FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	11	664	0.0166	1.62%	1.51%	11	10	102%	109%
55-59	11	729	0.0151	1.93%	1.75%	14	13	78%	87%
60-64	11	542	0.0203	2.28%	1.95%	12	11	89%	104%
65-69	5	259	0.0193	2.91%	2.33%	8	6	67%	83%
70-74	8	134	0.0597	4.07%	3.09%	5	4	151%	199%
75-79	1	25	0.0400	6.01%	4.46%	1	1	70%	94%
80-84	0	6	0.0000	8.94%	6.81%	1	0	0%	0%
85-89	0	5	0.0000	13.19%	10.51%	1	1	0%	0%
90-94	0	0	N/A	19.40%	14.97%	0	0	0%	0%
95-99	0	0	N/A	28.37%	21.63%	0	0	0%	0%
100-104	0	0	N/A	39.35%	31.54%	0	0	0%	0%
105-109	0	0	N/A	51.36%	41.83%	0	0	0%	0%
Total	47	2,364				53	45	89%	104%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
ACTIVE MORTALITY EXPERIENCE - MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	490	0.0000	0.03%	0.04%	0	0	0%	0%
20-24	8	7,843	0.0010	0.05%	0.04%	4	3	220%	267%
25-29	24	17,321	0.0014	0.04%	0.04%	7	7	325%	343%
30-34	22	20,772	0.0011	0.05%	0.05%	9	11	234%	200%
35-39	16	21,899	0.0007	0.05%	0.07%	11	16	140%	100%
40-44	29	23,688	0.0012	0.07%	0.10%	16	25	178%	116%
45-49	47	27,891	0.0017	0.12%	0.16%	32	44	146%	107%
50-54	69	28,070	0.0025	0.20%	0.24%	55	67	125%	103%
55-59	120	26,903	0.0045	0.32%	0.34%	87	93	138%	129%
60-64	113	20,432	0.0055	0.56%	0.50%	114	101	99%	112%
65-69	68	8,542	0.0080	0.97%	0.74%	83	62	82%	110%
70-74	45	3,457	0.0130	1.62%	1.13%	56	38	80%	118%
Total	561	207,308				475	467	118%	120%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
ACTIVE MORTALITY EXPERIENCE - FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	437	0.0000	0.01%	0.02%	0	0	0%	0%
20-24	4	8,728	0.0005	0.02%	0.01%	1	1	298%	400%
25-29	12	28,202	0.0004	0.02%	0.01%	5	4	240%	300%
30-34	14	34,311	0.0004	0.02%	0.02%	8	8	176%	175%
35-39	20	36,370	0.0005	0.03%	0.04%	11	14	182%	143%
40-44	32	37,697	0.0008	0.05%	0.06%	17	22	187%	145%
45-49	43	43,504	0.0010	0.08%	0.09%	34	39	128%	110%
50-54	65	44,899	0.0014	0.12%	0.13%	56	59	116%	110%
55-59	98	42,092	0.0023	0.18%	0.19%	78	82	126%	120%
60-64	104	29,805	0.0035	0.27%	0.30%	81	88	128%	118%
65-69	32	9,422	0.0034	0.43%	0.49%	41	44	78%	73%
70-74	9	2,466	0.0036	0.74%	0.81%	18	19	49%	47%
Total	433	317,933				350	380	124%	114%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
ACTIVE MORTALITY EXPERIENCE - MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	101	0.0000	0.03%	0.04%	0	0	0%	0%
20-24	0	1,665	0.0000	0.05%	0.03%	1	0	0%	0%
25-29	5	7,992	0.0006	0.04%	0.02%	3	2	147%	250%
30-34	2	9,870	0.0002	0.05%	0.03%	4	3	45%	67%
35-39	5	10,493	0.0005	0.05%	0.04%	5	5	91%	100%
40-44	10	11,114	0.0009	0.07%	0.07%	8	7	131%	143%
45-49	20	11,966	0.0017	0.12%	0.11%	14	13	145%	154%
50-54	19	11,069	0.0017	0.20%	0.17%	22	19	87%	100%
55-59	38	9,826	0.0039	0.32%	0.26%	32	26	119%	146%
60-64	30	7,259	0.0041	0.56%	0.42%	40	30	74%	100%
65-69	22	2,997	0.0073	0.97%	0.69%	29	20	76%	110%
70-74	11	1,117	0.0098	1.62%	1.10%	18	12	61%	92%
Total	162	85,469				177	137	92%	118%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
ACTIVE MORTALITY EXPERIENCE - FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	97	0.0000	0.01%	0.01%	0	0	0%	0%
20-24	0	5,177	0.0000	0.01%	0.01%	1	1	0%	0%
25-29	4	28,126	0.0001	0.02%	0.01%	4	3	89%	133%
30-34	10	34,269	0.0003	0.02%	0.02%	7	6	141%	167%
35-39	19	39,288	0.0005	0.03%	0.03%	11	11	179%	173%
40-44	29	47,549	0.0006	0.04%	0.04%	19	20	150%	145%
45-49	37	54,169	0.0007	0.07%	0.06%	38	34	98%	109%
50-54	44	49,598	0.0009	0.11%	0.09%	55	47	79%	94%
55-59	71	42,280	0.0017	0.17%	0.14%	70	58	102%	122%
60-64	77	28,148	0.0027	0.24%	0.22%	69	59	112%	131%
65-69	26	7,990	0.0033	0.39%	0.37%	31	28	84%	93%
70-74	11	1,877	0.0059	0.66%	0.69%	12	12	88%	92%
Total	328	338,568				317	279	103%	118%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
ACTIVE MORTALITY EXPERIENCE - MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	86	0.0000	0.03%	0.03%	0	0	0%	0%
20-24	3	5,742	0.0005	0.05%	0.04%	3	2	113%	150%
25-29	11	15,978	0.0007	0.04%	0.04%	7	6	161%	183%
30-34	20	16,503	0.0012	0.05%	0.04%	7	7	267%	286%
35-39	6	14,515	0.0004	0.05%	0.05%	8	7	79%	86%
40-44	14	14,783	0.0009	0.07%	0.07%	10	10	138%	140%
45-49	18	13,919	0.0013	0.12%	0.10%	16	13	112%	138%
50-54	14	8,897	0.0016	0.20%	0.14%	18	12	80%	117%
55-59	12	5,292	0.0023	0.32%	0.21%	17	11	70%	109%
60-64	12	2,785	0.0043	0.56%	0.32%	16	9	77%	133%
65-69	3	932	0.0032	0.97%	0.53%	9	5	33%	60%
70-74	3	58	0.0517	1.62%	0.98%	1	1	320%	300%
Total	116	99,490				111	83	105%	140%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
ACTIVE MORTALITY EXPERIENCE - FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	6	0.0000	0.01%	0.01%	0	0	0%	0%
20-24	1	1,700	0.0006	0.02%	0.02%	0	0	382%	0%
25-29	1	5,334	0.0002	0.02%	0.02%	1	1	106%	100%
30-34	1	4,910	0.0002	0.02%	0.03%	1	1	88%	100%
35-39	6	4,549	0.0013	0.03%	0.04%	1	2	437%	300%
40-44	4	4,405	0.0009	0.05%	0.06%	2	2	200%	200%
45-49	6	4,607	0.0013	0.08%	0.08%	4	3	168%	200%
50-54	10	3,894	0.0026	0.12%	0.10%	5	4	206%	250%
55-59	7	2,875	0.0024	0.18%	0.14%	5	4	132%	175%
60-64	8	1,495	0.0054	0.27%	0.19%	4	3	197%	267%
65-69	0	360	0.0000	0.43%	0.30%	2	1	0%	0%
70-74	0	3	0.0000	0.74%	0.60%	0	0	0%	0%
Total	44	34,138				25	21	175%	210%

(Exposures, actual, and expected deaths are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
DISABILITY EXPERIENCE - MALE

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	0	N/A	0.05%	0.03%	0	0	0%	0%
20-24	0	299	0.0000	0.05%	0.03%	0	0	0%	0%
25-29	2	5,712	0.0004	0.07%	0.05%	4	3	50%	67%
30-34	8	14,095	0.0006	0.12%	0.08%	17	12	47%	67%
35-39	12	18,704	0.0006	0.19%	0.13%	36	24	33%	50%
40-44	33	23,968	0.0014	0.29%	0.20%	70	48	47%	69%
45-49	68	29,187	0.0023	0.41%	0.28%	121	81	56%	84%
50-54	101	30,729	0.0033	0.62%	0.42%	192	130	53%	78%
55-59	181	29,701	0.0061	0.89%	0.60%	263	177	69%	102%
60-64	172	22,800	0.0075	1.13%	0.77%	259	172	67%	100%
Total	577	175,195				962	647	60%	89%

(Exposures, actual, and expected disabilities are based on headcounts.)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
DISABILITY EXPERIENCE - FEMALE

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	0	N/A	0.05%	0.03%	0	0	0%	0%
20-24	0	166	0.0000	0.05%	0.03%	0	0	0%	0%
25-29	1	5,957	0.0002	0.05%	0.03%	3	2	31%	50%
30-34	8	21,361	0.0004	0.09%	0.06%	19	13	41%	62%
35-39	23	29,894	0.0008	0.15%	0.09%	43	27	53%	85%
40-44	43	36,413	0.0012	0.20%	0.12%	72	45	60%	96%
45-49	92	44,967	0.0020	0.31%	0.19%	139	87	66%	106%
50-54	148	49,501	0.0030	0.51%	0.32%	250	156	59%	95%
55-59	235	47,467	0.0050	0.79%	0.49%	374	233	63%	101%
60-64	172	34,279	0.0050	1.19%	0.74%	408	248	42%	69%
Total	722	270,005				1,310	811	55%	89%

(Exposures, actual, and expected disabilities are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
DISABILITY EXPERIENCE - MALE

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	0	N/A	0.04%	0.02%	0	0	0%	0%
20-24	0	27	0.0000	0.04%	0.02%	0	0	0%	0%
25-29	0	1,332	0.0000	0.05%	0.02%	1	0	0%	0%
30-34	1	5,528	0.0002	0.07%	0.03%	4	2	25%	50%
35-39	1	7,320	0.0001	0.11%	0.04%	8	3	12%	33%
40-44	3	8,294	0.0004	0.20%	0.08%	17	6	18%	50%
45-49	7	9,073	0.0008	0.32%	0.12%	29	11	24%	64%
50-54	16	8,397	0.0019	0.52%	0.20%	44	17	36%	94%
55-59	18	7,282	0.0025	0.83%	0.32%	60	23	30%	78%
60-64	28	5,403	0.0052	1.18%	0.45%	64	24	44%	117%
Total	74	52,656				227	86	33%	86%

(Exposures, actual, and expected disabilities are based on headcounts.)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
DISABILITY EXPERIENCE - FEMALE

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	0	N/A	0.03%	0.01%	0	0	0%	0%
20-24	0	15	0.0000	0.03%	0.01%	0	0	0%	0%
25-29	0	5,080	0.0000	0.05%	0.02%	2	1	0%	0%
30-34	0	20,767	0.0000	0.06%	0.02%	13	5	0%	0%
35-39	3	27,237	0.0001	0.08%	0.03%	21	9	14%	33%
40-44	12	35,610	0.0003	0.15%	0.06%	54	22	22%	55%
45-49	27	42,891	0.0006	0.27%	0.11%	117	46	23%	59%
50-54	64	40,889	0.0016	0.44%	0.18%	180	71	36%	90%
55-59	100	35,325	0.0028	0.70%	0.28%	246	97	41%	103%
60-64	74	23,923	0.0031	0.99%	0.39%	237	92	31%	80%
Total	280	231,737				870	343	32%	82%

(Exposures, actual, and expected disabilities are based on headcounts.)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
DISABILITY EXPERIENCE - MALE AND FEMALE COMBINED

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	0	54	0.0000	0.15%	0.15%	0	0	0%	0%
20-24	0	3,123	0.0000	0.16%	0.16%	5	5	0%	0%
25-29	9	10,744	0.0008	0.20%	0.20%	21	21	43%	43%
30-34	40	15,596	0.0026	0.32%	0.32%	49	49	82%	82%
35-39	74	15,945	0.0046	0.49%	0.49%	78	78	95%	95%
40-44	108	17,075	0.0063	0.70%	0.70%	119	119	91%	91%
45-49	145	16,590	0.0087	0.96%	0.96%	158	158	92%	92%
50-54	136	11,417	0.0119	1.38%	1.38%	158	158	86%	86%
Total	512	90,544				588	588	87%	87%

(Exposures, actual, and expected disabilities are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
TERMINATION EXPERIENCE - SERVICE-BASED - MALE

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 403,220	$ 1,526,372	0.2642	20.04%	22.00%	$ 305,875	$ 335,802	132%	120%
1	283,650	1,511,306	0.1877	17.47%	18.00%	263,980	272,035	107%	104%
2	151,429	1,122,028	0.1350	12.28%	13.00%	137,777	145,864	110%	104%
3	113,587	1,009,883	0.1125	10.29%	10.00%	103,934	100,988	109%	112%
4	85,463	897,496	0.0952	8.96%	9.00%	80,452	80,775	106%	106%
5	72,925	772,517	0.0944	8.48%	8.50%	65,533	65,664	111%	111%
6	56,219	700,308	0.0803	7.10%	8.00%	49,741	56,025	113%	100%
7	43,959	633,838	0.0694	6.39%	7.00%	40,526	44,369	108%	99%
8	33,154	600,111	0.0552	5.50%	6.00%	33,006	36,007	100%	92%
9	32,860	580,214	0.0566	5.00%	5.50%	29,011	31,912	113%	103%
10	18,554	400,929	0.0463	4.00%	5.00%	16,037	20,046	116%	93%
Total	$ 1,295,019	$ 9,755,000				$ 1,125,872	$ 1,189,485	115%	109%

($ in thousands of salary)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
TERMINATION EXPERIENCE - SERVICE-BASED - FEMALE

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 611,163	$ 2,142,334	0.2853	22.96%	26.00%	$ 491,936	$ 557,007	124%	110%
1	478,291	2,149,973	0.2225	21.74%	22.00%	467,483	472,994	102%	101%
2	234,801	1,562,340	0.1503	14.14%	15.00%	220,954	234,351	106%	100%
3	175,171	1,390,635	0.1260	11.83%	12.00%	164,503	166,876	106%	105%
4	132,367	1,225,672	0.1080	10.14%	10.00%	124,280	122,567	107%	108%
5	107,309	1,075,213	0.0998	9.69%	9.00%	104,238	96,769	103%	111%
6	83,821	964,941	0.0869	8.44%	8.00%	81,410	77,195	103%	109%
7	68,297	879,353	0.0777	7.50%	7.00%	65,982	61,555	104%	111%
8	57,957	819,034	0.0708	6.66%	6.00%	54,524	49,142	106%	118%
9	49,766	790,459	0.0630	5.74%	5.50%	45,394	43,475	110%	114%
10	32,600	552,582	0.0590	4.60%	5.00%	25,419	27,629	128%	118%
Total	$ 2,031,542	$ 13,552,534				$ 1,846,123	$ 1,909,561	110%	106%

($ in thousands of salary)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
TERMINATION EXPERIENCE - YEAR(S) FROM RETIREMENT - MALE

Year(s) From Retirement	Actual Terminations	Total Exposures	Actual Rate	Assumed Rate		Expected Terminations		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	$ 1,635	$ 99,782	0.0164	0.60%	0.90%	$ 599	$ 898	273%	182%
2	2,187	180,026	0.0121	0.70%	1.00%	1,260	1,800	174%	122%
3	2,308	193,700	0.0119	0.80%	1.10%	1,550	2,131	149%	108%
4	3,168	250,642	0.0126	0.90%	1.20%	2,256	3,008	140%	105%
5	4,211	295,520	0.0143	1.00%	1.30%	2,955	3,842	143%	110%
6	4,630	305,054	0.0152	1.10%	1.50%	3,356	4,576	138%	101%
7	5,545	316,184	0.0175	1.30%	1.70%	4,110	5,375	135%	103%
8	6,359	330,243	0.0193	1.50%	1.90%	4,954	6,275	128%	101%
9	8,650	350,019	0.0247	1.80%	2.00%	6,300	7,000	137%	124%
10	8,576	370,052	0.0232	2.00%	2.20%	7,401	8,141	116%	105%
11	11,715	393,820	0.0297	2.30%	2.60%	9,058	10,239	129%	114%
12	10,879	408,981	0.0266	2.60%	2.90%	10,633	11,860	102%	92%
13	14,284	423,398	0.0337	2.90%	3.20%	12,279	13,549	116%	105%
14	17,214	445,019	0.0387	3.10%	3.40%	13,796	15,131	125%	114%
15	18,399	471,012	0.0391	3.40%	3.70%	16,014	17,427	115%	106%
16	21,340	512,491	0.0416	3.70%	3.90%	18,962	19,987	113%	107%
17	23,248	538,791	0.0431	4.00%	4.20%	21,552	22,629	108%	103%
Total	$ 164,346	$ 5,884,736				$ 137,035	$ 153,868	120%	107%

($ in thousands of salary)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
TERMINATION EXPERIENCE - YEAR(S) FROM RETIREMENT - FEMALE

Year(s) From Retirement	Actual Terminations	Total Exposures	Actual Rate	Assumed Rate		Expected Terminations		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	$ 1,812	$ 115,719	0.0157	0.80%	1.00%	$ 926	$ 1,157	196%	157%
2	2,909	207,020	0.0141	0.90%	1.00%	1,863	2,070	156%	141%
3	3,088	227,283	0.0136	1.00%	1.00%	2,273	2,273	136%	136%
4	4,434	310,202	0.0143	1.10%	1.10%	3,412	3,412	130%	130%
5	6,308	368,957	0.0171	1.20%	1.20%	4,427	4,427	142%	142%
6	6,101	384,540	0.0159	1.30%	1.40%	4,999	5,384	122%	113%
7	8,891	407,254	0.0218	1.40%	1.60%	5,702	6,516	156%	136%
8	8,879	430,737	0.0206	1.60%	1.90%	6,892	8,184	129%	108%
9	12,914	457,278	0.0282	1.80%	2.10%	8,231	9,603	157%	134%
10	15,110	487,413	0.0310	2.00%	2.40%	9,748	11,698	155%	129%
11	17,163	520,795	0.0330	2.30%	2.70%	11,978	14,061	143%	122%
12	19,193	552,844	0.0347	2.60%	3.00%	14,374	16,585	134%	116%
13	19,145	571,204	0.0335	3.00%	3.40%	17,136	19,421	112%	99%
14	26,156	599,249	0.0436	3.40%	3.80%	20,374	22,771	128%	115%
15	27,501	638,971	0.0430	3.80%	4.20%	24,281	26,837	113%	102%
16	31,448	680,762	0.0462	4.20%	4.50%	28,592	30,634	110%	103%
17	40,344	724,062	0.0557	4.60%	4.80%	33,307	34,755	121%	116%
Total	$ 251,395	$ 7,684,289				$ 198,515	$ 219,788	127%	114%

($ in thousands of salary)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
TERMINATION EXPERIENCE - SERVICE-BASED - MALE

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 61,015	$ 232,683	0.2622	21.35%	22.00%	$ 49,688	$ 51,190	123%	119%
1	63,272	386,259	0.1638	21.74%	17.00%	83,986	65,664	75%	96%
2	43,437	358,346	0.1212	14.52%	12.00%	52,030	43,002	83%	101%
3	37,085	342,132	0.1084	11.68%	10.00%	39,949	34,213	93%	108%
4	28,274	315,692	0.0896	9.80%	9.00%	30,941	28,412	91%	100%
5	22,673	279,469	0.0811	8.26%	8.00%	23,071	22,357	98%	101%
6	18,723	255,577	0.0733	7.09%	7.00%	18,133	17,890	103%	105%
7	12,833	234,958	0.0546	6.06%	6.00%	14,249	14,098	90%	91%
8	10,777	222,760	0.0484	5.02%	5.00%	11,173	11,138	96%	97%
9	10,697	218,024	0.0491	4.16%	5.00%	9,066	10,901	118%	98%
10	6,415	172,672	0.0372	3.89%	4.86%	6,720	8,392	95%	76%
Total	$ 315,201	$ 3,018,573				$ 339,004	$ 307,258	93%	103%

($ in thousands of salary)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
TERMINATION EXPERIENCE - SERVICE-BASED - FEMALE

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 171,470	$ 527,880	0.3248	20.22%	24.00%	$ 106,740	$ 126,691	161%	135%
1	152,613	1,075,280	0.1419	12.54%	14.00%	134,843	150,539	113%	101%
2	117,831	1,060,443	0.1111	10.30%	11.00%	109,230	116,649	108%	101%
3	101,371	1,026,433	0.0988	8.91%	9.00%	91,426	92,379	111%	110%
4	79,424	985,641	0.0806	7.37%	7.50%	72,651	73,923	109%	107%
5	72,862	921,548	0.0791	6.89%	7.00%	63,529	64,508	115%	113%
6	57,943	876,092	0.0661	5.65%	6.00%	49,500	52,566	117%	110%
7	49,575	828,274	0.0599	5.25%	5.50%	43,498	45,555	114%	109%
8	43,253	792,047	0.0546	4.61%	5.00%	36,474	39,602	119%	109%
9	36,075	795,382	0.0454	3.70%	4.50%	29,463	35,792	122%	101%
10	26,011	656,274	0.0396	3.00%	4.40%	19,688	28,876	132%	90%
Total	$ 908,427	$ 9,545,295				$ 757,043	$ 827,081	120%	110%

($ in thousands of salary)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
TERMINATION EXPERIENCE - YEAR(S) FROM RETIREMENT - MALE

Year(s) From Retirement	Actual Terminations	Total Exposures	Actual Rate	Assumed Rate		Expected Terminations		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	$ 615	$ 31,632	0.0194	0.80%	0.80%	$ 253	$ 253	243%	243%
2	719	73,244	0.0098	0.90%	0.90%	659	659	109%	109%
3	756	80,052	0.0094	1.00%	1.00%	801	801	94%	94%
4	1,553	100,252	0.0155	1.10%	1.10%	1,103	1,103	141%	141%
5	1,567	118,696	0.0132	1.20%	1.20%	1,424	1,424	110%	110%
6	2,146	130,822	0.0164	1.30%	1.40%	1,701	1,832	126%	117%
7	2,529	140,682	0.0180	1.40%	1.60%	1,970	2,251	128%	112%
8	2,938	150,005	0.0196	1.50%	1.70%	2,250	2,550	131%	115%
9	3,486	166,044	0.0210	1.70%	1.80%	2,823	2,989	123%	117%
10	4,313	176,178	0.0245	2.00%	2.00%	3,524	3,524	122%	122%
11	4,451	184,995	0.0241	2.20%	2.20%	4,070	4,070	109%	109%
12	5,640	190,922	0.0295	2.40%	2.40%	4,582	4,582	123%	123%
13	5,244	192,714	0.0272	2.60%	2.60%	5,011	5,011	105%	105%
14	5,757	197,425	0.0292	2.70%	2.70%	5,330	5,330	108%	108%
15	6,920	203,091	0.0341	2.80%	2.90%	5,687	5,890	122%	117%
16	8,521	213,204	0.0400	2.90%	3.10%	6,183	6,609	138%	129%
17	8,521	217,222	0.0392	3.00%	3.50%	6,517	7,603	131%	112%
Total	$ 65,675	$ 2,567,180				$ 53,888	$ 56,481	122%	116%

($ in thousands of salary)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
TERMINATION EXPERIENCE - YEAR(S) FROM RETIREMENT - FEMALE

Year(s) From Retirement	Actual Terminations	Total Exposures	Actual Rate	Assumed Rate		Expected Terminations		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	$ 2,334	$ 149,025	0.0157	0.60%	0.80%	$ 894	$ 1,192	261%	196%
2	2,642	307,971	0.0086	0.60%	0.80%	1,848	2,464	143%	107%
3	3,073	327,987	0.0094	0.60%	0.80%	1,968	2,624	156%	117%
4	3,862	416,853	0.0093	0.70%	0.90%	2,918	3,752	132%	103%
5	5,059	499,512	0.0101	0.80%	0.90%	3,996	4,496	127%	113%
6	7,613	542,034	0.0140	0.90%	1.00%	4,878	5,420	156%	140%
7	7,618	583,647	0.0131	1.00%	1.10%	5,836	6,420	131%	119%
8	9,745	631,139	0.0154	1.10%	1.20%	6,943	7,574	140%	129%
9	10,960	675,361	0.0162	1.20%	1.40%	8,104	9,455	135%	116%
10	14,055	716,128	0.0196	1.40%	1.60%	10,026	11,458	140%	123%
11	14,632	748,793	0.0195	1.60%	1.80%	11,981	13,478	122%	109%
12	18,309	763,077	0.0240	1.80%	2.00%	13,735	15,262	133%	120%
13	18,548	771,293	0.0240	2.00%	2.20%	15,426	16,968	120%	109%
14	22,142	790,947	0.0280	2.20%	2.40%	17,401	18,983	127%	117%
15	23,388	800,716	0.0292	2.40%	2.80%	19,217	22,420	122%	104%
16	25,520	816,167	0.0313	2.70%	3.10%	22,036	25,301	116%	101%
17	31,342	823,062	0.0381	3.00%	3.40%	24,692	27,984	127%	112%
Total	$ 220,843	$ 10,363,712				$ 171,899	$ 195,251	128%	113%

($ in thousands of salary)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)

TERMINATION EXPERIENCE - SERVICE-BASED - MALE AND FEMALE COMBINED

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	$ 235,262	$ 847,305	0.2777	25.00%	25.00%	$ 211,826	$ 211,826	111%	111%
2	181,069	863,268	0.2097	18.00%	18.00%	155,388	155,388	117%	117%
3	97,023	654,217	0.1483	14.00%	14.00%	91,590	91,590	106%	106%
4	74,805	601,965	0.1243	12.00%	12.00%	72,236	72,236	104%	104%
5	62,571	555,949	0.1125	10.70%	10.70%	59,487	59,487	105%	105%
6	48,236	489,857	0.0985	9.54%	9.54%	46,732	46,732	103%	103%
7	40,444	433,911	0.0932	8.50%	8.50%	36,882	36,882	110%	110%
8	32,973	399,543	0.0825	7.58%	7.58%	30,285	30,285	109%	109%
9	28,574	367,624	0.0777	6.75%	6.75%	24,815	24,815	115%	115%
10	22,537	348,452	0.0647	6.02%	6.02%	20,977	20,977	107%	107%
11	20,311	336,286	0.0604	5.37%	5.37%	18,059	18,059	112%	112%
12	19,075	320,130	0.0596	4.78%	4.78%	15,302	15,302	125%	125%
13	15,847	297,755	0.0532	4.26%	4.26%	12,684	12,684	125%	125%
14	12,650	280,669	0.0451	3.80%	3.80%	10,665	10,665	119%	119%
15	10,506	267,303	0.0393	3.39%	3.39%	9,062	9,062	116%	116%
16	10,152	261,084	0.0389	3.02%	3.02%	7,885	7,885	129%	129%
17	7,567	256,384	0.0295	2.69%	2.69%	6,897	6,897	110%	110%
18	6,840	249,355	0.0274	2.40%	2.40%	5,985	5,985	114%	114%
19	6,732	236,769	0.0284	2.14%	2.14%	5,067	5,067	133%	133%
20	5,522	224,954	0.0245	1.91%	1.91%	4,297	4,297	129%	129%
21	4,643	214,397	0.0217	1.70%	1.70%	3,645	3,645	127%	127%
22	3,839	197,591	0.0194	1.51%	1.51%	2,984	2,984	129%	129%
23	3,694	189,772	0.0195	1.35%	1.35%	2,562	2,562	144%	144%
24	2,478	172,332	0.0144	1.20%	1.20%	2,068	2,068	120%	120%
Total	$ 953,350	$ 9,066,871				$ 857,379	$ 857,379	111%	111%

($ are in thousands of salary)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - AGE BASED - MALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FE RTW	$ 144,577	$ 572,301	0.2526	50.00%	35.00%	$ 286,150	$ 228,920	51%	63%
66	$ 63,426	$ 229,678	0.2761	20.00%	20.00%	$ 45,936	$ 57,420	138%	110%
67	35,238	169,091	0.2084	17.00%	20.00%	28,746	42,273	123%	83%
68	25,760	129,690	0.1986	17.00%	20.00%	22,047	25,938	117%	99%
69	21,952	99,640	0.2203	17.00%	20.00%	16,939	19,928	130%	110%
70	17,832	74,914	0.2380	17.00%	20.00%	12,735	14,983	140%	119%
71	11,409	55,471	0.2057	17.00%	20.00%	9,430	11,094	121%	103%
72	8,201	41,746	0.1965	17.00%	20.00%	7,043	8,349	116%	98%
73	4,566	31,348	0.1457	17.00%	20.00%	5,329	6,270	86%	73%
74	6,277	26,186	0.2397	17.00%	20.00%	4,432	5,214	142%	120%
Subtotal	$ 194,661	$ 857,765				$ 152,637	$ 191,468	128%	102%
75 or more	10,964	68,022	0.1612	100.00%	100.00%	62,215	62,215	18%	18%
Total	$ 350,202	$ 1,498,088				$ 501,002	$ 482,604	70%	73%

FE RTW: First year the member is eligible to commence their retirement benefit and concurrently remain in employment.

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - AGE BASED - FEMALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FE RTW	$ 218,979	$ 692,683	0.3161	50.00%	35.00%	$ 346,341	$ 242,439	63%	90%
66	$ 83,822	$ 257,213	0.3259	22.00%	25.00%	$ 56,587	$ 64,303	148%	130%
67	43,579	169,232	0.2575	19.00%	25.00%	31,301	42,308	139%	103%
68	29,304	121,107	0.2420	19.00%	20.00%	23,010	24,221	127%	121%
69	17,956	84,060	0.2136	19.00%	20.00%	15,971	16,812	112%	107%
70	13,852	64,362	0.2152	19.00%	20.00%	12,229	12,872	113%	108%
71	12,661	48,658	0.2602	19.00%	20.00%	9,245	9,732	137%	130%
72	7,120	32,454	0.2194	19.00%	20.00%	6,034	6,491	118%	110%
73	4,254	22,723	0.1872	19.00%	20.00%	4,317	4,545	99%	94%
74	3,986	16,837	0.2368	19.00%	20.00%	3,181	3,348	125%	119%
Subtotal	$ 216,535	$ 816,647				$ 161,876	$ 184,633	134%	117%
75 or more	8,756	41,662	0.2102	100.00%	100.00%	39,361	39,361	22%	22%
Totals	$ 444,270	$ 1,550,991				$ 547,579	$ 466,433	81%	95%

FE RTW: First year the member is eligible to commence their retirement benefit and concurrently remain in employment.

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - SERVICE BASED - MALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Service	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
28	$ 270,420	$ 907,713	0.2979	15.00%	15.00%	$ 136,157	$ 136,157	199%	199%
29	127,419	697,868	0.1826	10.00%	15.00%	69,787	104,680	183%	122%
30	66,905	527,976	0.1267	10.00%	10.00%	52,798	52,798	127%	127%
31	45,307	400,375	0.1132	10.00%	10.00%	40,037	40,037	113%	113%
32	27,111	304,633	0.0890	10.00%	10.00%	30,463	30,463	89%	89%
33	24,702	252,427	0.0979	18.00%	10.00%	45,437	25,243	54%	98%
34	15,765	195,199	0.0808	18.00%	10.00%	35,136	19,520	45%	81%
35	9,527	142,450	0.0669	18.00%	10.00%	25,641	14,245	37%	67%
36	6,252	120,774	0.0518	20.00%	20.00%	24,155	24,155	26%	26%
37	14,439	97,759	0.1477	20.00%	20.00%	19,552	19,552	74%	74%
38	6,459	74,485	0.0867	20.00%	20.00%	14,897	14,897	43%	43%
39	10,812	67,277	0.1607	20.00%	20.00%	13,455	13,455	80%	80%
Subtotal	$ 625,117	$ 3,788,934				$ 507,514	$ 495,202	123%	126%
40 & Over	29,026	178,662	0.1625	100.00%	100.00%	8,530	8,530	340%	340%
Total	$ 1,279,259	$ 7,756,530				$ 1,023,559	$ 998,934	125%	128%

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - SERVICE BASED - FEMALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Service	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
28	$ 354,016	$ 1,136,442	0.3115	18.00%	20.00%	$ 204,560	$ 227,288	173%	156%
29	174,037	792,490	0.2196	10.00%	20.00%	93,331	177,157	186%	98%
30	79,825	560,273	0.1425	10.00%	10.00%	66,530	65,576	120%	122%
31	51,952	412,675	0.1259	10.00%	10.00%	49,158	49,131	106%	106%
32	33,364	299,490	0.1114	10.00%	10.00%	35,344	35,543	94%	94%
33	32,263	228,557	0.1412	20.00%	20.00%	47,886	49,499	67%	65%
34	13,741	151,909	0.0905	20.00%	20.00%	32,839	33,197	42%	41%
35	15,266	121,410	0.1257	20.00%	20.00%	26,335	26,621	58%	57%
36	12,093	107,888	0.1121	20.00%	20.00%	22,809	23,057	53%	52%
37	9,395	87,568	0.1073	20.00%	20.00%	20,151	19,583	47%	48%
38	11,285	69,491	0.1624	20.00%	20.00%	16,742	15,601	67%	72%
39	6,027	54,359	0.1109	20.00%	20.00%	13,651	12,523	44%	48%
Subtotal	$ 793,262	$ 4,022,551				$ 629,334	$ 734,776	126%	108%
40 & Over	18,143	137,226	0.1322	100.00%	100.00%	142,342	142,342	13%	13%
Total	$ 811,406	$ 4,159,777				$ 771,676	$ 877,117	105%	93%

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - AGE BASED - MALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FE RTW	$ 39,984	$ 122,499	0.3264	50.00%	35.00%	$ 61,250	$ 42,875	65%	93%
66	$ 19,413	$ 54,959	0.3532	20.00%	25.00%	$ 10,992	$ 13,740	177%	141%
67	9,961	33,720	0.2954	20.00%	25.00%	6,744	8,430	148%	118%
68	6,563	22,430	0.2926	20.00%	25.00%	4,486	5,607	146%	117%
69	3,098	15,495	0.1999	20.00%	20.00%	3,099	3,099	100%	100%
70	4,366	14,654	0.2979	20.00%	20.00%	2,931	2,931	149%	149%
71	2,230	9,987	0.2233	20.00%	20.00%	1,997	1,997	112%	112%
72	2,139	8,954	0.2389	20.00%	20.00%	1,791	1,791	119%	119%
73	1,167	6,578	0.1774	20.00%	20.00%	1,316	1,316	89%	89%
74	1,442	5,256	0.2743	20.00%	20.00%	1,047	1,047	138%	138%
Subtotal	$ 50,379	$ 172,034				$ 34,402	$ 39,958	146%	126%
75 or more	2,661	10,875	0.2447	100.00%	100.00%	10,769	10,769	25%	25%
Total	$ 53,040	$ 182,909				$ 45,171	$ 50,727	117%	105%

FE RTW: First year the member is eligible to commence their retirement benefit and concurrently remain in employment.

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - AGE BASED - FEMALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FE RTW	$ 183,670	$ 522,126	0.3518	50.00%	35.00%	$ 261,063	$ 208,851	70%	88%
66	$ 64,859	$ 174,386	0.3719	25.00%	30.00%	$ 43,597	$ 52,316	149%	124%
67	29,540	108,107	0.2732	20.00%	30.00%	21,621	32,432	137%	91%
68	21,474	76,341	0.2813	20.00%	30.00%	15,268	22,902	141%	94%
69	11,774	52,985	0.2222	20.00%	20.00%	10,597	10,597	111%	111%
70	9,022	36,914	0.2444	20.00%	20.00%	7,383	7,383	122%	122%
71	4,760	26,898	0.1770	20.00%	20.00%	5,380	5,380	88%	88%
72	4,068	19,440	0.2093	20.00%	20.00%	3,815	3,888	107%	105%
73	3,721	12,786	0.2911	20.00%	20.00%	2,557	2,557	146%	146%
74	1,388	8,600	0.1614	20.00%	20.00%	1,710	1,710	81%	81%
Subtotal	$ 150,606	$ 516,456				$ 111,928	$ 139,165	135%	108%
75 or more	6,879	24,151	0.2848	100.00%	100.00%	23,997	23,687	29%	29%
Total	$ 157,485	$ 540,607				$ 135,925	$ 162,851	116%	97%

FE RTW: First year the member is eligible to commence their retirement benefit and concurrently remain in employment.

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - SERVICE BASED - MALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Service	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
28	$ 56,342	$ 328,968	0.1713	7.00%	15.00%	$ 23,028	$ 49,345	245%	114%
29	103,951	286,593	0.3627	8.00%	15.00%	22,927	42,989	453%	242%
30	15,963	151,622	0.1053	8.00%	10.00%	12,130	15,162	132%	105%
31	11,568	102,279	0.1131	9.00%	10.00%	9,205	10,228	126%	113%
32	6,387	73,874	0.0865	10.00%	10.00%	7,387	7,387	86%	86%
33	5,565	41,912	0.1328	11.00%	10.00%	4,610	4,191	121%	133%
34	751	29,081	0.0258	12.00%	10.00%	3,490	2,908	22%	26%
35	2,525	22,637	0.1115	13.00%	10.00%	2,943	2,264	86%	112%
36	2,852	12,850	0.2219	14.00%	10.00%	1,799	1,285	159%	222%
37	2,151	9,555	0.2251	18.00%	10.00%	1,720	956	125%	225%
38	1,483	7,000	0.2118	17.00%	10.00%	1,190	700	125%	212%
39	1,104	5,387	0.2049	17.00%	10.00%	916	539	121%	205%
Subtotal	$ 210,640	$ 1,071,759				$ 91,345	$ 137,954	231%	153%
40 & Over	1,716	18,997	0.0903	100.00%	100.00%	18,997	18,997	9%	9%
Total	$ 212,355	$ 1,090,756				$ 110,342	$ 156,951	192%	135%

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
UNREDUCED RETIREMENT EXPERIENCE - SERVICE BASED - FEMALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Service	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
28	$ 316,378	$ 1,502,081	0.2106	8.00%	15.00%	$ 120,166	$ 225,312	263%	140%
29	476,457	1,256,456	0.3792	8.00%	12.00%	100,516	150,775	474%	316%
30	91,647	644,698	0.1422	9.00%	12.00%	58,023	77,364	158%	118%
31	61,066	447,358	0.1365	10.00%	12.00%	44,736	53,683	137%	114%
32	35,163	296,910	0.1184	11.00%	12.00%	32,660	35,629	108%	99%
33	26,827	199,403	0.1345	12.00%	12.00%	23,928	23,928	112%	112%
34	17,220	140,273	0.1228	18.00%	12.00%	25,249	16,833	68%	102%
35	14,435	102,819	0.1404	18.00%	12.00%	18,507	12,338	78%	117%
36	14,091	71,408	0.1973	18.00%	15.00%	12,853	10,711	110%	132%
37	9,055	58,243	0.1555	18.00%	15.00%	10,484	8,736	86%	104%
38	6,271	46,241	0.1356	19.00%	15.00%	8,786	6,936	71%	90%
39	5,759	31,459	0.1831	20.00%	15.00%	6,292	4,719	92%	122%
Subtotal	$ 1,074,369	$ 4,797,350				$ 462,202	$ 626,965	232%	171%
40 & Over	15,231	73,417	0.2075	100.00%	100.00%	73,417	73,417	21%	21%
Total	$ 1,089,599	$ 4,870,767				$ 535,619	$ 700,382	203%	156%

($ in thousands of liability)

*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
UNREDUCED RETIREMENT EXPERIENCE - AGE BASED - MALE AND FEMALE COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposure	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
55	$ 47,158	$ 257,349	0.1832	20.00%	20.00%	$ 51,470	$ 51,470	92%	92%
56	26,387	233,296	0.1131	20.00%	20.00%	46,659	46,659	57%	57%
57	39,983	207,814	0.1924	20.00%	20.00%	41,563	41,563	96%	96%
58	26,196	181,601	0.1442	10.00%	12.00%	18,160	21,792	144%	120%
59	23,717	165,288	0.1435	10.00%	12.00%	16,529	19,835	143%	120%
60	22,788	154,859	0.1472	10.00%	12.00%	15,486	18,583	147%	123%
61	24,953	142,276	0.1754	25.00%	25.00%	35,569	35,569	70%	70%
62	38,534	125,762	0.3064	25.00%	25.00%	31,440	31,440	123%	123%
63	23,206	91,702	0.2531	25.00%	25.00%	22,925	22,925	101%	101%
64	15,128	73,705	0.2053	25.00%	25.00%	18,426	18,426	82%	82%
65	14,258	55,468	0.2570	25.00%	25.00%	13,867	13,867	103%	103%
66	12,869	46,042	0.2795	25.00%	25.00%	11,511	11,511	112%	112%
67	10,290	35,184	0.2925	25.00%	25.00%	8,796	8,796	117%	117%
68	5,108	25,773	0.1982	25.00%	25.00%	6,443	6,443	79%	79%
69	4,556	18,634	0.2445	25.00%	25.00%	4,658	4,658	98%	98%
70	2,748	12,694	0.2165	100.00%	100.00%	12,694	12,694	22%	22%
71	2,279	10,663	0.2137	100.00%	100.00%	10,663	10,663	21%	21%
72	1,870	7,541	0.2479	100.00%	100.00%	7,541	7,541	25%	25%
73	3,048	5,942	0.5130	100.00%	100.00%	5,942	5,942	51%	51%
74	596	2,890	0.2062	100.00%	100.00%	2,890	2,890	21%	21%
Subtotal	$ 345,670	$ 1,854,484				$ 383,233	$ 393,268	90%	88%
75 or more	441	3,296	0.1338	100.00%	100.00%	3,296	3,296	13%	13%
Total	$ 346,111	$ 1,857,779				$ 386,529	$ 396,564	90%	87%

($ in thousands of benefit)
*Columns may not add due to rounding.

POLICE OFFICERS RETIREMENT SYSTEM (PORS)
UNREDUCED RETIREMENT EXPERIENCE - SERVICE BASED - MALE AND FEMALE COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Service	Actual Retirements	Total Exposure	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
25	$ 186,638	$ 557,947	0.3345	40.00%	30.00%	$ 223,179	$ 167,384	84%	112%
26	77,052	436,383	0.1766	10.00%	14.00%	43,638	61,094	177%	126%
27	52,235	347,510	0.1503	10.00%	14.00%	34,751	48,651	150%	107%
28	39,448	310,073	0.1272	10.00%	14.00%	31,007	43,410	127%	91%
29	41,398	252,157	0.1642	10.00%	14.00%	25,216	35,302	164%	117%
30	30,017	198,147	0.1515	10.00%	14.00%	19,815	27,741	151%	108%
31	29,437	152,260	0.1933	10.00%	14.00%	15,226	21,316	193%	138%
32	19,429	121,065	0.1605	10.00%	14.00%	12,106	16,949	160%	115%
33	18,766	89,963	0.2086	10.00%	14.00%	8,996	12,595	209%	149%
34	8,291	67,969	0.1220	10.00%	14.00%	6,797	9,516	122%	87%
35	12,493	52,918	0.2361	10.00%	14.00%	5,292	7,409	236%	169%
36	7,221	40,534	0.1781	10.00%	14.00%	4,053	5,675	178%	127%
37	6,140	33,285	0.1845	10.00%	14.00%	3,329	4,660	184%	132%
38	4,865	27,587	0.1763	10.00%	14.00%	2,759	3,862	176%	126%
39	1,970	23,295	0.0846	10.00%	14.00%	2,330	3,261	85%	60%
Subtotal	$ 535,399	$ 2,711,093				$ 438,493	$ 468,825	122%	114%
40 & Over	10,728	59,156	0.1814	100.00%	100.00%	59,156	59,156	18%	18%
Total	$ 546,128	$ 2,770,249				$ 497,649	$ 527,981	110%	103%

($ in thousands of benefit)

*Columns may not add due to rounding.

JUDGES AND SOLICITORS RETIREMENT SYSTEM (JSRS)
RETIREMENT EXPERIENCE - SERVICE BASED ASSUMPTION

				Assumed Rate		Expected Retirements		Actual/Expected	
Service	Actual Retirements	Total Exposures	Actual Rate	Current*	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
15	$ 0	$ 937	0.0000	10%	20%	$ 94	$ 187	0%	0%
16	1,038	2,082	0.4988	10%	20%	208	416	499%	250%
17	0	0	N/A	10%	20%	0	0	0%	0%
18	0	0	N/A	10%	20%	0	0	0%	0%
19	0	0	N/A	10%	20%	0	0	0%	0%
20	3,167	6,567	0.4822	40%	50%	2,627	3,284	121%	96%
21	0	2,278	0.0000	40%	15%	911	342	0%	0%
22	0	3,296	0.0000	40%	15%	1,318	494	0%	0%
23	966	3,090	0.3125	40%	15%	1,236	464	78%	208%
24	0	3,121	0.0000	40%	15%	1,248	468	0%	0%
25	2,383	29,665	0.0803	15%	10%	4,450	2,967	54%	80%
26	2,860	23,616	0.1211	15%	10%	3,542	2,362	81%	121%
27	2,146	15,535	0.1381	15%	10%	2,330	1,553	92%	138%
28	0	11,912	0.0000	15%	10%	1,787	1,191	0%	0%
29	1,700	11,385	0.1493	15%	10%	1,708	1,138	100%	149%
30	0	7,989	0.0000	15%	10%	1,198	799	0%	0%
31	0	12,926	0.0000	15%	10%	1,939	1,293	0%	0%
Subtotal	$ 14,259	$ 134,399				$ 24,597	$ 16,958	58%	84%
32	$ 12,486	$ 15,851	0.7877	100%	100%	$ 15,851	$ 15,851	79%	79%
33	3,410	3,410	1.0000	100%	100%	3,410	3,410	100%	100%
Subtotal	$ 15,896	$ 19,262				$ 19,261	$ 19,261	83%	83%
Total	$ 30,155	$ 153,660				$ 43,858	$ 36,219	69%	83%

* The retirement rates shown for the current assumption are weighted average rates based on an age and service related structure.

Note: The retirement rate is 100% at age 72, the mandatory retirement age for members in JSRS. The retirement rate is 100% when Solicitors and Public Defenders attain 31 years of service.

The exposures, actual, and expected retirements exclude retirements due to attaining the age 72 mandatory retirement age.

($ in thousands of liability)

*Columns may not add due to rounding.

GENERAL ASSEMBLY RETIREMENT SYSTEM (GARS)
RETIREMENT EXPERIENCE - AGE BASED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
41	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
42	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
43	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
44	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
45	1	1	1.0000	50.0%	50.0%	0.5	0.5	200%	200%
46	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
47	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
48	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
49	0	1	0.0000	50.0%	50.0%	0.5	0.5	0%	0%
50	0	1	0.0000	50.0%	50.0%	0.5	0.5	0%	0%
51	0	1	0.0000	50.0%	50.0%	0.5	0.5	0%	0%
52	0	1	0.0000	50.0%	50.0%	0.5	0.5	0%	0%
53	0	2	0.0000	50.0%	50.0%	1.0	1.0	0%	0%
54	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
55	0	1	0.0000	50.0%	50.0%	0.5	0.5	0%	0%
56	0	1	0.0000	50.0%	50.0%	0.5	0.5	0%	0%
57	0	1	0.0000	50.0%	50.0%	0.5	0.5	0%	0%
58	0	0	N/A	50.0%	50.0%	0.0	0.0	0%	0%
59	3	3	1.0000	50.0%	50.0%	1.5	1.5	200%	200%
60	2	22	0.0909	50.0%	20.0%	11.0	4.4	18%	45%
61	0	16	0.0000	10.0%	7.0%	1.6	1.1	0%	0%
62	0	14	0.0000	10.0%	7.0%	1.4	1.0	0%	0%
63	3	15	0.2000	10.0%	7.0%	1.5	1.1	200%	273%
64	1	14	0.0714	10.0%	7.0%	1.4	1.0	71%	100%
65	0	12	0.0000	20.0%	10.0%	2.4	1.2	0%	0%
66	1	8	0.1250	20.0%	10.0%	1.6	0.8	63%	125%
67	0	10	0.0000	20.0%	10.0%	2.0	1.0	0%	0%
68	1	14	0.0714	20.0%	10.0%	2.8	1.4	36%	71%
69	3	12	0.2500	20.0%	10.0%	2.4	1.2	125%	250%
Subtotal	**15**	**150**				**34.6**	**20.7**	**43%**	**72%**
70+	8	51	0.1569	100.0%	100.0%	51.0	51.0	16%	16%
Total	23	201				85.6	71.7	27%	32%

Note: Under the current and recommended assumptions, 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.

(Exposures, actual, and expected retirements are based on headcounts.)

*Columns may not add due to rounding.

NATIONAL GUARD SUPPLEMENTAL RETIREMENT PLAN (SCNG)
RETIREMENT EXPERIENCE - SERVICE BASED ASSUMPTION

				Assumed Rate		Expected Retirements		Actual/Expected	
Service	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Less than 20	0	0	N/A	0.0%	0.0%	0.0	0.0	0%	0%
20	41	318	0.1289	2.5%	10.0%	8.0	31.8	513%	129%
21	64	841	0.0761	2.5%	5.0%	21.0	42.1	305%	152%
22	36	815	0.0442	2.5%	5.0%	20.4	40.8	176%	88%
23	35	660	0.0530	2.5%	5.0%	16.5	33.0	212%	106%
24	28	635	0.0441	2.5%	5.0%	15.9	31.8	176%	88%
25	24	651	0.0369	5.0%	5.0%	32.6	32.6	74%	74%
26	26	708	0.0367	5.0%	5.0%	35.4	35.4	73%	73%
27	35	733	0.0477	5.0%	5.0%	36.7	36.7	95%	95%
28	30	675	0.0444	5.0%	5.0%	33.8	33.8	89%	89%
29	29	614	0.0472	5.0%	5.0%	30.7	30.7	94%	94%
Subtotal	**348**	**6,650**				**251.0**	**348.7**	**139%**	**100%**
30+	195	2,840	0.0687	100.0%	100.0%	N/A	N/A	N/A	N/A
Total	543	9,490							

Note: Members who retire prior to age 60 are assumed to defer retirement benefits until age 60.
Supplemental retirement benefit reaches a maximum $100 per month upon attaining 30 years of service.

(Exposures, actual, and expected retirements are based on headcounts.)
*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
REDUCED RETIREMENT EXPERIENCE - AGE BASED - MALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
55	$ 11,810	$ 138,906	0.0850	10.00%	7.00%	$ 13,891	$ 9,723	85%	121%
56	10,512	137,716	0.0763	9.00%	7.00%	12,394	9,640	85%	109%
57	8,231	139,505	0.0590	9.00%	7.00%	12,555	9,765	66%	84%
58	9,538	133,614	0.0714	9.00%	7.00%	12,025	9,353	79%	102%
59	5,702	115,519	0.0494	9.00%	7.00%	10,397	8,086	55%	71%
60	23,268	504,490	0.0461	9.00%	7.00%	45,404	35,314	51%	66%
61	25,749	497,332	0.0518	9.00%	7.00%	44,760	34,813	58%	74%
62	68,349	479,264	0.1426	22.00%	15.00%	105,438	71,890	65%	95%
63	54,463	414,229	0.1315	16.00%	15.00%	66,277	62,134	82%	88%
64	41,967	369,386	0.1136	16.00%	15.00%	59,102	55,408	71%	76%
Total	$ 259,589	$ 2,929,959				$ 382,243	$ 306,126	68%	85%

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL EMPLOYEES
REDUCED RETIREMENT EXPERIENCE - AGE BASED - FEMALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
55	$ 17,157	$ 230,413	0.0745	9.00%	9.00%	$ 20,737	$ 20,737	83%	83%
56	12,647	197,494	0.0640	10.00%	9.00%	19,749	17,774	64%	71%
57	14,533	195,430	0.0744	10.00%	9.00%	19,543	17,589	74%	83%
58	12,843	187,132	0.0686	11.00%	9.00%	20,584	16,842	62%	76%
59	6,827	180,208	0.0379	11.00%	9.00%	19,823	16,219	34%	42%
60	53,866	733,980	0.0734	11.00%	9.00%	80,738	66,058	67%	82%
61	45,246	704,996	0.0642	11.00%	9.00%	77,550	63,450	58%	71%
62	109,895	657,406	0.1672	20.00%	15.00%	131,481	98,611	84%	111%
63	73,189	535,970	0.1366	18.00%	15.00%	96,475	80,395	76%	91%
64	59,436	453,391	0.1311	18.00%	15.00%	81,610	68,009	73%	87%
Total	$ 405,636	$ 4,076,418				$ 568,290	$ 465,684	71%	87%

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
REDUCED RETIREMENT EXPERIENCE - AGE BASED - MALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
55	$ 3,933	$ 53,715	0.0732	10.00%	14.00%	$ 5,372	$ 7,520	73%	52%
56	4,956	49,553	0.1000	11.00%	14.00%	5,451	6,937	91%	71%
57	6,561	39,988	0.1641	11.00%	14.00%	4,399	5,598	149%	117%
58	2,261	34,470	0.0656	11.00%	14.00%	3,792	4,826	60%	47%
59	2,619	38,387	0.0682	11.00%	14.00%	4,223	5,374	62%	49%
60	14,328	147,152	0.0974	11.00%	14.00%	16,187	20,601	89%	70%
61	17,488	140,795	0.1242	11.00%	14.00%	15,487	19,711	113%	89%
62	28,780	131,802	0.2184	22.00%	20.00%	28,996	26,360	99%	109%
63	25,119	112,217	0.2238	22.00%	20.00%	24,688	22,443	102%	112%
64	19,503	100,324	0.1944	22.00%	20.00%	22,071	20,065	88%	97%
Total	$ 125,549	$ 848,404				$ 130,665	$ 139,435	96%	90%

($ in thousands of liability)

*Columns may not add due to rounding.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
REDUCED RETIREMENT EXPERIENCE - AGE BASED - FEMALE

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
55	$ 15,750	$ 214,555	0.0734	9.00%	10.00%	$ 19,310	$ 21,456	82%	73%
56	20,082	204,099	0.0984	9.00%	10.00%	18,369	20,410	109%	98%
57	16,765	192,176	0.0872	10.00%	10.00%	19,218	19,218	87%	87%
58	17,777	196,457	0.0905	10.00%	10.00%	19,646	19,646	90%	90%
59	21,878	201,249	0.1087	10.00%	10.00%	20,125	20,125	109%	109%
60	65,529	704,527	0.0930	10.00%	10.00%	70,453	70,453	93%	93%
61	70,333	656,409	0.1071	13.00%	10.00%	85,333	65,641	82%	107%
62	104,682	587,562	0.1782	20.00%	20.00%	117,512	117,512	89%	89%
63	102,134	462,459	0.2209	20.00%	20.00%	92,492	92,492	110%	110%
64	68,166	347,163	0.1964	20.00%	20.00%	69,433	69,433	98%	98%
Total	$ 503,095	$ 3,766,654				$ 531,889	$ 516,386	95%	97%

($ in thousands of liability)

*Columns may not add due to rounding.