GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

SOUTH CAROLINA PUBLIC EMPLOYEE BENEFIT AUTHORITY
SOUTH CAROLINA RETIREMENT SYSTEMS
2016 ACTUARIAL EXPERIENCE STUDY
FOR THE PERIOD ENDING JUNE 30, 2015

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February 12, 2016

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

Dear Members of the Board:

Subject: Results of 2016 Experience Study

We are pleased to present our report of the 2016 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 and contribution rates.

Using the recommended set of actuarial assumptions should present a more accurate portrayal of the Systems' financial condition and should reduce the magnitude of future experience gains and losses.

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,

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

Daniel J. White, FSA, EA, MAAA
Senior Consultant and 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 Use of outdated or inappropriate assumptions can result in understated costs which will lead to higher future contribution requirements or perhaps an inability to pay benefits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.

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
- 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, 2015 is generally reasonable. However, for certain assumptions, the experience over a ten-year period ending June 30, 2015 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 smoothes 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 IV 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 133, 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 reducing the inflation assumption from 2.75% to 2.25%, placing it closer to recent inflation levels and closer to the levels expected in the financial markets, forecasts by economists, and investment professionals. This change affects other economic assumptions.

2. Investment Return Assumption: This is a prescribed assumption under Section 9-16-335 of the South Carolina State Code. We recommend reducing the investment return assumption from 7.50% to 7.25%. Based on current capital market assumptions and the target investment portfolio adopted by the investment commission in February 2016, there would be approximately a 50% likelihood that investment returns would be at least 7.25% over the next 20 years. This probability statistic reflects the advanced recognition of approximately 0.25% in annual return from a portable alpha investment strategy. If decision makers do not want to advance recognize this active management strategy, then they would adopt a 7.00% investment return assumption. Also, to conform to GASB accounting standards No. 67 and 68, we recommend that administrative expenses are no longer assumed to be net of investment returns and be explicitly assumed a percentage of payroll in the normal cost rate. Based on the 2015 CAFR, we recommend assuming administrative expenses will be 0.12% of covered payroll for SCRS and PORS.

3. Salary Increases for Individual Members: Recommend decreasing the long-service component of the salary increase assumption from 3.50% to 3.00% to reflect the recommended decrease in the price inflation assumption. In addition, we recommend some increases to the step-rate and promotional component of the salary increases assumption for shorter service employees. These recommendations will result in a net decrease in assumed rate of salary increases for all employee groups, with the greatest decrease being to public school employees and smaller changes for general employees in SCRS and members in PORS.

4. Payroll growth rate: Recommend decreasing the payroll growth rate for SCRS and PORS from 3.50% to 3.00% to reflect the recommended 0.50% decrease in the price inflation assumption. Changing the payroll growth assumption has no impact on the liabilities, but does assume there is a lower growth in the future payroll to amortize the unfunded actuarial accrued liability, which results in an increase in the current contribution requirements.

Demographic Assumptions:

5. Mortality: Recommend replacing the base mortality tables, which are currently variations of the RP-2000 mortality tables, with a Retirement System specific mortality table developed using the actual mortality experience of non-disabled retirees in SCRS and PORS. Since there is not enough experience to develop a specific mortality assumption for disabled retirees and active members, we recommend using variations of the RP-2014 mortality tables for these members. We recommend continued use of the generational mortality improvement assumption Scale AA to explicitly project future improvement in mortality for non-disabled and disabled retirees.

6. Retirement: Recommend increasing the assumed rates of retirement for general employees and public school employees in SCRS who retire with a reduced retirement benefit. We recommend modifications to the retirement rates for PORS at certain services and ages, but the overall number of expected retirements does not significantly change.

7. Termination/Withdrawal: We recommend decreasing the rates of termination for general employees and public school employees in SCRS and no change to the current termination assumption for PORS.

8. Refund of Member Contributions Account Balance: For SCRS, we recommend changing the assumption for which members will elect a refund of their member contributions account balance to have an explicit assumption based on historical experience. We believe an explicit assumption better reflects actual experience and provides increased transparency on member behavior. Since the termination rates are notably lower for vested members in PORS, we do not recommend a change to the current assumption/method for that System.

9. Disability Incidence: Recommend increasing the rates of disability for PORS. There are no recommended changes to the disability rates for SCRS.

Actuarial Methods and Policies

10. Asset Valuation Method: Recommend modifying the current asset valuation method such that each year's investment gain or loss (determined on a market value of asset basis) is recognized over a closed five-year period at the rate of 20% per year. This method would be applied prospectively so there would be no change to the actuarial value of assets calculated as of June 30, 2016. The recommended method will continue 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.

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: Recommend the Board explore adopting a funding policy for SCRS and PORS that utilizes possible Board Authorized increases in the contribution rates, as permitted by State Code, such that the funding period is maintained or decreases, even in years the System incurs investment or liability losses.

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:

	Retirement System		
Assumption (1)	**JSRS** (2)	**GARS** (3)	**SCNG** (4)
Economic Assumptions			
1. Inflation	2.25%	2.25%	2.25%
2. Investment Return	7.25%	7.25%	7.25%
3. Salary Increases	2.75%	N/A	N/A
4. Payroll Growth Rate	2.75%	N/A	N/A
Demographic Assumptions			
5. Mortality	Same as Public School Employees	Same as General Employees	Same as PORS
6. Termination/Withdrawal	None	None	Reduce
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	5-Year (with bases)	5-Year (with bases)	5-Year (with bases)
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. The ASB adopted a revised standard in September 2013 and is applicable for measurement dates on or after September 30, 2014.

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.

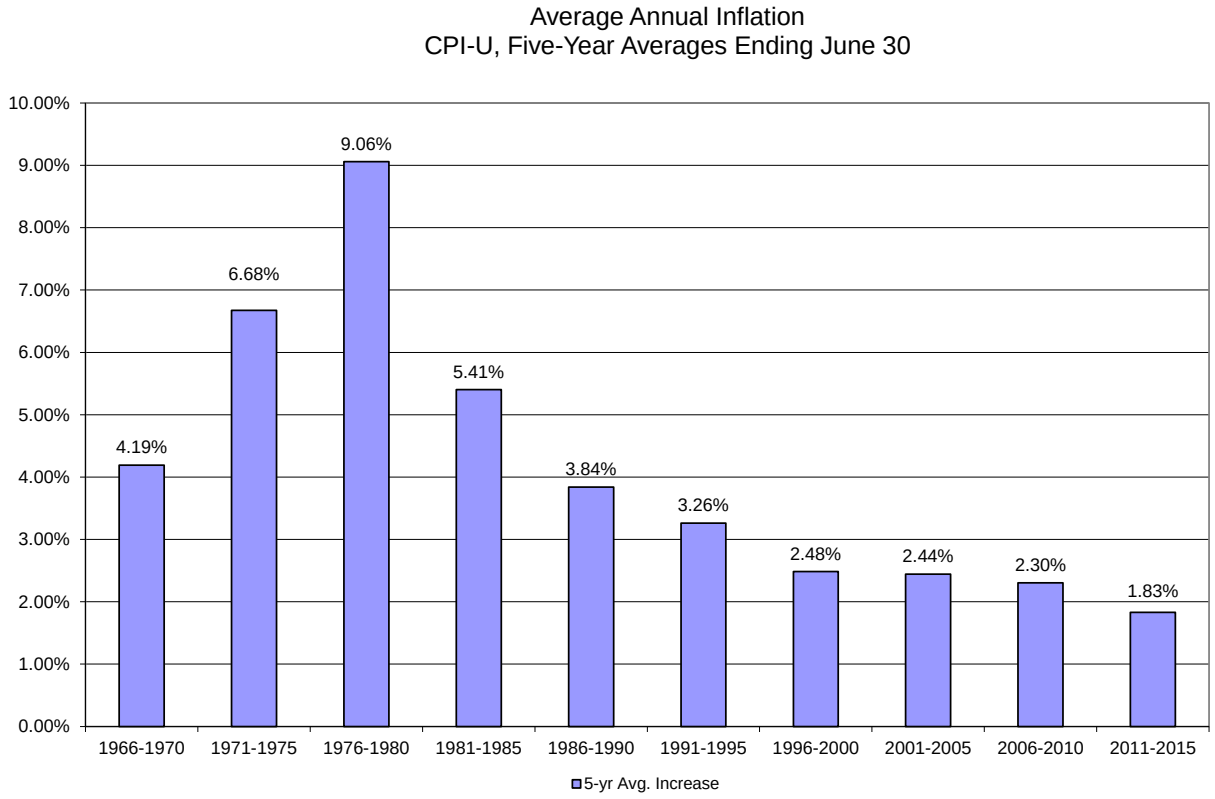
Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period. Nevertheless, the economic assumptions are much more subjective in 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 2.75%.

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, 2015:

Periods Ending June 30, 2015	Average Annual Increase in CPI-U
Last five (5) years	1.83%
Last ten (10) years	2.07%
Last fifteen (15) years	2.19%
Last twenty (20) years	2.26%
Last twenty-five (25) years	2.46%
Last thirty (30) years	2.69%
Since 1913 (first available year)	3.16%

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

As you can see, inflation has been relatively low over the last thirty years.

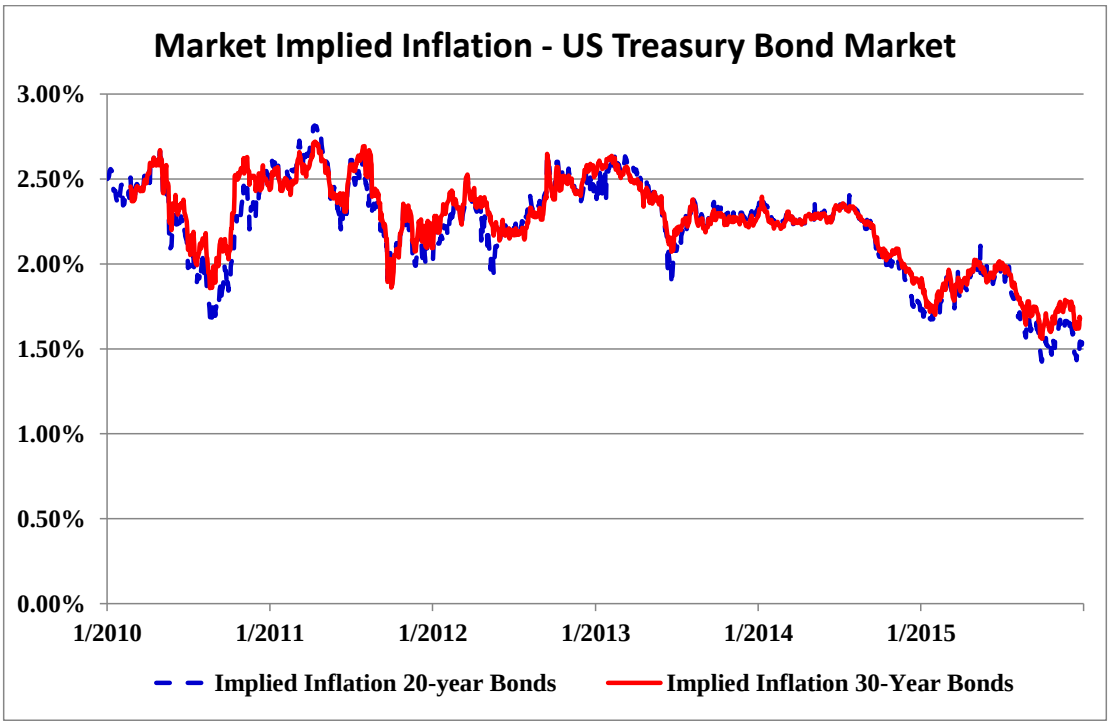
We also reviewed measures of inflation within four regions of the US (Northeast, Southeast, Midwest, and West) that are published by the US Bureau of Labor Statistics. The data shows that the cost of housing and other goods and services in the Southeast region are less expensive than other regions of the country, but the rate of change in the cost of those goods and services in the Southeast is the same as other parts of the country.

Forecasts from Investment Consulting Firms

Most investment consulting firms, in setting their capital market assumptions, assume that inflation will be less than 2.75%. Based on a 2015 survey of capital market assumptions of ten investment consulting firms who develop longer-term assumptions (20 years or more) performed by Horizon Actuarial Services, LLC, shows that the expected rate of inflation, as measured by CPI-U, for the next 20 years ranged from 2.0% to 2.8% with a median expectation of 2.3%. Aon Hewitt, the South Carolina Investment Commission's investment consultant, assumes that inflation will increase at the rate of 2.00% per year over the next thirty years (based on their 4th quarter 2015 capital market assumptions).

Expectations Implied in the Bond Market

Another source of information about future inflation is the market for US Treasury bonds. For example, the July 1, 2015 yield for 20-year inflation indexed Treasury bonds was 0.94% plus actual inflation. The yield for 20-year non-indexed US Treasury bonds was 2.92%. Simplistically, this means that on that day the bond market was predicting that inflation over the next twenty years would average 1.96% [(1 + 2.92%) / (1 + 0.94%) - 1] per year. The difference in yield for 30 year bonds implies 2.00% inflation over the next 30 years. This is consistent with most forecasts of inflation and overall economic growth being lower over the next decade. The chart on the following page shows the historical market implied inflation from January 1, 2010 through December 31, 2015.



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 2015 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.7% under the intermediate cost assumption. The Chief Actuary for the Social Security Administration reduced this assumption by 0.10% from the prior year and slightly narrowed the low cost and high cost scenarios to 2.0% and 3.4%, respectively.

Survey of Professional Forecasters and Fed Policy

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their most recent forecast (third quarter of 2015) was for inflation over the next ten years (2015 to 2024) to average 2.15%. Most observers expect inflation to continue to be low as the economy works out of the recession. However, the Society of Professional Forecasters is implicitly assuming a 2.00% inflation rate from 2015-2019, so it is not just the next 5-7 years that is depressing inflation forecasts.

Additionally, the Fed has openly stated that they have a target 2.00% inflation rate.

Comparison of Inflation Expectations from 2011 to 2016

Finally, the table below provides a comparison of the inflation expectations documented in the 2011 experience study report and the current inflation expectations.

Source	Inflation Expectations 2011	2016	Change
(1)	(2)	(3)	(4)
RSIC's Investment Consultant[1]	3.00%	2.00%	-1.00%
Implied Inflation 20-Year Treasuries	2.65%	1.96%	-0.69%
2015 SSA Trustees Report	2.80%	2.70%	-0.10%
Survey of Professional Forecasters	2.40%	2.15%	-0.25%

[1] RSIC's investment consultant in 2011 was New England Pension Consultants (NEPC) and their inflation expectation is not an assumption for US CPI, but an assumption for the global inflation that would flow through to corporate earnings and be received by a diversified investor.

Recommendation

Using these sources, we recommend reducing the current 2.75% assumption to 2.25%, placing it closer to recent inflation levels and closer to the levels expected in the financial markets. As you will see, this change also affects other economic assumptions, including the payroll growth rate assumption for amortizing the unfunded actuarial accrued liability.

INVESTMENT RETURN ASSUMPTION

The investment return assumption is one of the principal 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 assumes inflation of 2.75% per annum and an annual real rate of return of 4.75%, net of investment and administrative expenses. This is also a prescribed assumption in Section 9-16-335 of the South Carolina State Code and the General Assembly must pass legislation to change the investment return assumption.

Investment and Administrative Expenses

The trust fund pays expenses in addition to member benefits and refunds, we must make some assumption about these. Almost all actuaries treat investment expenses as an offset to the investment return assumption. That is, the investment return assumption represents expected return after payment of investment expenses.

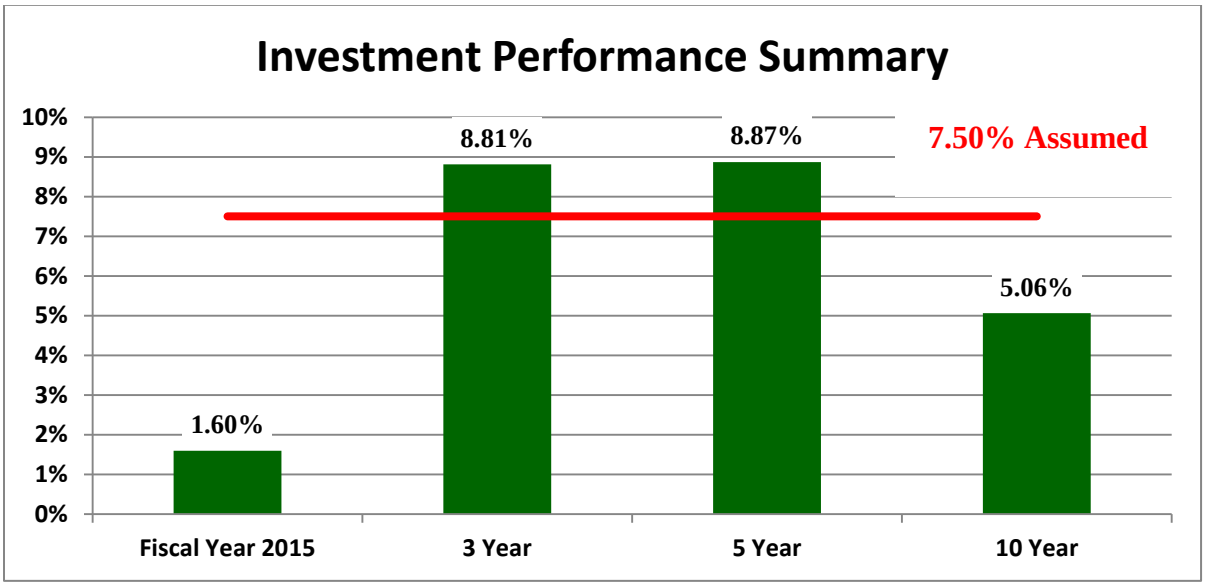
In regards to investment expenses, anticipated returns developed by investment consulting firms and discussed in more detail later in this section are net of investment related fees (including alternative asset classes such as real estate, private equity, and hedge funds). Therefore, we will not make any adjustments to account for investment related expenses.

On the other hand, the GASB Accounting Standards No. 67 and 68 specify that the investment return assumption is net of investment expenses, but not administrative expenses. For the South Carolina Retirement Systems, the practice has been to set the investment return assumption as the net return after payment of both investment and administrative expenses. To be consistent with the new accounting standard, we recommend that the valuation has an explicit administrative expense assumption that is a percentage of payroll and include it in the normal cost rate. Based on plan administrative expenses reported in the 2015 CAFR, we are recommend including a 0.12% adjustment to the normal cost rate to reflect administrative expenses paid with plan assets.

This change in method for recognizing administrative expenses will also lessen the burden on the investment portfolio as investment returns are no longer assumed to also cover administrative expenses, which are approximately 0.05% of assets (based on the 2015 CAFR).

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.

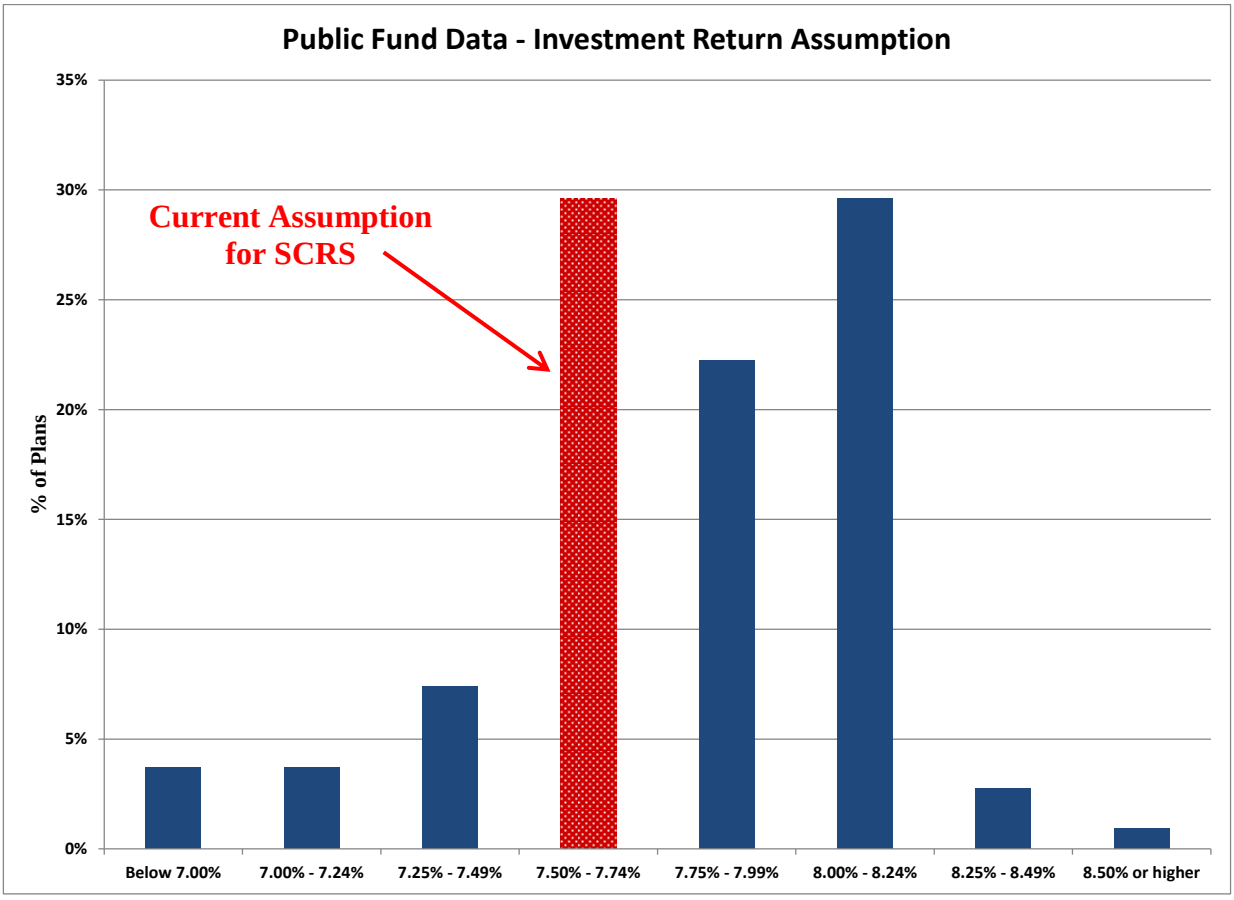


Source: Comprehensive Annualized Financial Report for the fiscal year ending June 30, 2015.

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.

Comparison to Peers

We do not recommend the selection of an investment return assumption based on prevalence information. However, it is still informative to identify where the investment return assumption for SCRS is compared to its peers. The chart on the following page shows the distribution of the investment return assumptions in the Public Plans Data as of December 2015 updated to reflect known changes to return assumptions that other retirement systems have made, but not yet included in the downloaded survey data.



Source: Public Plans Database (n=108). Median investment return assumption: 7.75% nominal return.

We also identified that the median real rate of return (i.e. the nominal return assumption less the inflation assumption) for these public plans is 4.58%, which is slightly less than the 4.75% net real rate of return assumption currently used for the Retirement Systems.

Forecasts Developed by RSIC's Investment Consultant

We believe a more appropriate approach to selecting an investment return assumption is to identify expected returns developed by mapping the RSIC's investment policy to forward-looking capital market assumptions that are developed by investment consulting firms.

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 the RSIC's investment consultant, Aon Hewitt (Aon). Aon regularly updates their capital market expectations (i.e. estimates of expected returns, volatility, and correlations) as the economy and financial markets evolve.

The estimates for core investments (i.e., fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds that are net of investment related fees. The investment return expectations for the alternative asset classes such as private equity and hedge funds are also net of investment expenses. Therefore, we did not make any adjustments to account for investment related expenses.

The RSIC's investment strategy includes the use of a portable alpha strategy, which is a beta neutral (i.e. market neutral) strategy that is often implemented through an overlay or by strategic asset allocation. We have included this strategy in our analysis and adhered to the assumptions used by RSIC's investment consultant, Aon Hewitt, as closely as possible. Based on current assumptions, this portable alpha strategy is expected to generate approximately 0.25% in additional annual return to the entire investment portfolio. We believe it is acceptable under current actuarial standards of practice to reflect this additional return, but since alpha can be difficult to achieve on a consistently through an entire market cycle, it would also be acceptable if decision makers did not advance recognize this anticipated return when selecting an investment return assumption. Without this advance recognition, the annual return expectation on the following pages would decrease by approximately 0.25%.

Below is a summary of the asset allocation for the System that was used in the analysis. The long-term investment portfolio allocation shown below was adopted by the RSIC Board on February 4, 2016.

Asset Class	Allocation
Global Equity[1]	33%
Large Cap US Equity	5%
Private Equity	9%
Short-Duration Gov't/Credit	2%
US Agg (Core Fixed Income)[1]	10%
High Yield / Bank Loans	6%
Private Debt	7%
Emerging Market Debt	5%
Non-US Bonds	6%
Hedge Funds[2]	4%
Other Opportunistic	2%
Real Estate	8%
Infrastructure	3%
Total	**100%**

[1] Portion of the allocation is allocated to portable alpha investment strategies.

[2] Hedge funds that are not dedicated to portable alpha strategies.

Source: RSIC

Where available, investments in these asset classes were split into subgroups to refine the analysis when identifiable. For example, Non-US Bonds were appropriately allocated into hedged and unhedged sub-asset classes.

Aon develops two sets of capital market assumptions, a "short-term" based on a 10-year investment horizon, and a "long-term" based on a 30-year investment horizon. Mapping the current asset allocation to HEK's 4th Quarter, 2015 short-term (10-year) and long-term (30-year) capital market expectations, we have calculated the following return expectations and probabilities.

Expected Return Statistics based on Aon Hewitt's 4th Quarter 2015 Capital Market Expectations

Item	Short-Term (10-Year)	Long-Term (30-Year)
(1)	(2)	(3)
Expected Compound Return		
- Expected Real Return	4.82%	5.24%
- Expected Nominal Return[1]	6.92%	7.34%

[1] Expected nominal return based on Aon Hewitt's inflation expectation.

As the shown in the table above, Aon's real rate of return is approximately 40 basis points higher in their long-term forecast. The increased real return is primarily due to higher expected returns on fixed income investments as the economy is expected to gradually move from a low interest rate to a more normal interest rate environment. The long-term return expectations on most equity asset classes and hedge funds are also slightly higher than their short-term expectations.

It is also important to point out that the expected real rate of return in Aon's short-term and long-term assumptions are greater than the 4.75% real rate of return that is currently assumed in the 7.50% investment return assumption. However, Aon's nominal return under both horizons is lower than the 7.50% return assumption currently used in the actuarial valuation, based Aon's underlying inflation is lower than currently assumed in the actuarial valuation.

Comparison of Aon Hewitt's Return Expectations to Other Investment Consultants

As we previously mentioned, most investment consulting firms develop forecasts regarding future investment returns. Aon's return expectations are one opinion among many different opinions in the profession investment community. To understand how Aon's expectations compare to expectations developed by other investment consulting firms, we have utilized a report issued by Horizon Actuarial Services, LLC (2015 Edition), which compiles and averages the return and risk forecasts of 29 major investment consulting firms (including Aon Hewitt).

We believe the Horizon's survey provides stakeholders important information in understanding whether RSIC's investment consultant is relatively optimistic or pessimistic compared to the professional investment community, as well as quantify differences in those expectations. We have mapped the Retirement System's asset allocation to the average survey assumptions and calculated the expected real rates of return.

The table below provides a comparison of Aon Hewitt's long-term return expectations and the average assumptions of the respondents to Horizon's 2015 Survey.

Comparison of Aon's Return Expectations to Horizon's Survey Average

	Short-Term		Long-Term	
Item	Aon	Horizon Survey	Aon	Horizon Survey
(1)	(2)	(3)	(4)	(5)
Expected Compound Real Return				
- Expected Real Return	4.82%	4.70%	5.24%	5.38%

The table shows, compared to the survey average, Aon's return expectations slightly more optimistic over the short-term and slightly less optimistic over the long-term period. However, we believe for decision making purposes, stakeholders can assume that return expectations developed using Aon's capital market assumptions are neither optimistic nor pessimistic compared to the average of the expectations developed by the professional investment community.

Note, only 10 of the 29 respondents to the Horizon's survey submitted long-term assumptions or assumptions with an investment horizon that is at least 20 years). Also, while this survey refers to the long-term horizon being a 20-year period, we have used the return expectations and calculated averages and return probabilities over a 30-year period, which is consistent with Aon's long-term assumptions. This adjustment does not affect the comparison, and we only make this comment for completeness for those readers who subsequently read the Horizon's survey.

Recommendation

The Retirement System theoretically has an indefinite life span which results in many stakeholders believing that emphasis should be placed solely on long-term expectations, even if short-term expectations are materially different. While the Retirement Systems are expected to have an indefinite life span, SCRS and PORS are relatively mature with material shorter-term liability attributable to current retirees. For example, as of the last actuarial valuation 64% of the $41.2 billion actuarial accrued liability is attributable to members who are currently receiving a retirement benefit. Due to the Systems' maturity, we believe an appropriate return assumption for these Systems should not completely ignore the short-term expectations.

After performing a projection that includes future members to maintain the current number of employees, we determined that the duration (i.e. time weighted average of the discounted benefit payments) is approximately 21 years for the South Carolina Retirement System. In other words, 21 years reflects the midpoint of the discounted benefit payments that are projected to be provided by the Retirement System. To reflect the System's maturity we used an equal

weighting, of Aon's 10-year and 30-year assumptions to develop a recommended investment return assumption that takes into account these shorter-term liabilities. This process yielded a 5.03% real rate of return (4.82% + 5.24%)/2. Therefore we recommend a real rate of return assumption of 5.00% and a nominal investment return assumption of 7.25%. The following table shows the components of the current and recommended investment return assumption.

Development of GRS's Recommended Investment Return Assumption

Item	Current Assumption	Recommended Assumption
(1)	(2)	(3)
- Expected Real Return	4.75%	5.00%
- Inflation Assumption	2.75%	2.25%
- Investment Rate of Return Assumption	7.50%	7.25%
- Probability of achieving the nominal return assumption over the next 20 years[1]:	46%	50%

[1] Based on Aon's 4th quarter 2015 capital market assumptions.

While it is documented in research papers that alpha can be achieved using the RSIC's portable alpha investment strategy, it is uncertain whether the strategy will consistently produce additional return. Therefore, we recommend the selection of a 7.00% investment return assumption if decision makers do not want to advance recognize the potential additional returns attributable to such investment strategy in the investment return assumption.

Decreasing the investment return assumption will increase the plan's actuarial accrued liability and contribution requirement. There are some additional principles to consider when selecting the investment return assumption:

- This is by far the most subjective assumption used in an actuarial valuation.
- Lowering the investment return assumption will increase the probability that the return assumption is met and decrease the size of the investment loss that is incurred during years the actual investment return is less than assumed.
- Due to compounding returns, legal limitations, and moral obligations it is much more difficult to manage a scenario of under-performance than over-performance. Therefore, scenarios of under-performance may want to be given more emphasis than those of over-performance.

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 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 given to continuing members by year for members in various groups:

Fiscal Year Ending	State and Local Gov Employees	Public School Employees	PORS
2006	6.5%	5.8%	7.7%
2007	5.4%	6.3%	5.6%
2008	6.1%	6.8%	6.4%
2009	3.6%	5.7%	3.9%
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%
Average	4.0%	4.3%	4.6%

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

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 SCRS's 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	3.17%	2.07%	1.10%
Public School Employees	2.71%	2.07%	0.64%
PORS	3.46%	2.07%	1.39%

The relatively low average salary increases for public school employees (compared to the other employee groups) may be less opportunity for promotions (either with the same school district or another school district), or a position with increased responsibility, such as in school administration.

We are proposing no change in the current 0.75% assumed rate salary increases in excess of inflation for long-service employees 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 members in PORS with 20 or more years of service.

Salary increase assumptions for shorter-service employees

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 5.00%, which was 2.30% more than the average increase of 2.70% for the same type of employee with twenty-one or more 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.

Step-rate assumptions were increased for state and local government employees as well as members in PORS. Adjustments to the step-rate assumptions for public educators were very minor.

Details of our analysis are shown in Section X beginning on page 98.

Salary Increases – Combined Effect

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[3]
General Employees	3.99%	2.07%	1.44%	1.92%	1.76%
Public School Employees	4.34%	2.07%	2.32%	2.27%	2.32%
PORS	4.61%	2.07%	2.10%	2.54%	2.43%

[1] The expected average increase in salary in excess of the 2.75% assumed rate of inflation.
[2] The actual salary increase in excess of inflation for all continuing active members during the 10-year observation period.
[3] The expected average increase in salary in excess of the 2.25% recommended assumed rate of inflation.

The overall effect of the changes to the salary increase assumption will result in slightly lower assumed rates of increases for all employee groups. The assumption for public school employees experienced the largest decrease in the salary assumption. Decreases in the salary assumption were smaller for General Employees and members in PORS.

Salary Increases – JSRS

All members in the retirement system for judges and solicitors receive the same percentage increase in their salary. The retirement system provides retirees 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
2001	2.0%		2006	3.0%		2011	0.0%
2002	0.0%		2007	3.0%		2012	3.0%
2003	0.0%		2008	1.0%		2013	0.0%
2004	3.0%		2009	0.0%		2014	2.0%
2005	4.0%		2010	0.0%		2015	0.0%

The average salary increase for the last 10 years and 15 years was 1.20% and 1.40%, respectively. These salary increases trailed the actual rate of inflation by approximately 0.80% per year.

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. It is possible for the Judicial Department to request a significant increase in salaries (e.g. 10%) to "catch-up" for prior years where there were no salary increases. However, it is unknown if the Judicial Department will request a significant increase, or the amount of such increase. Therefore, we must assume that salary increases will occur modestly on an annual basis.

In this instance, we do not believe that historical experience is a reliable indicator of future expectations. Rather, we recommend a salary increase assumption that is 2.75%, which is comprised of the recommended 2.25% price inflation assumption and 0.50% for merit and productivity. This would be a 0.25% decrease from the current salary increase assumption.

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 3.50% 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 50 years, wage inflation has been about 0.60% a year larger than price inflation for the economy as a whole. Similarly, wage inflation has exceeded price inflation by only 0.60% for the last 15 years.

The chart on the following page 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	Contributing Payroll	Contributing Members	Increase in Excess of Membership	Actual Inflation	Payroll Increase in Excess of Actual Inflation (Constant Membership)
Last 1-Year	3.19%	1.20%	1.99%	0.12%	1.87%
Last 3-Years	2.79%	0.71%	2.08%	1.31%	0.77%
Last 5-Years	0.01%	0.21%	-0.02%	1.83%	-2.03%
Last 10-Years	2.15%	0.81%	1.34%	2.07%	-0.73%

As the last five years of experience show, the financial crisis in 2008 and 2009 put a considerable fiscal strain on states and local governments. Across the country, governmental employers were forced to decrease their employee workforce and depress salary increases to remaining employees. Due to the effect of the 2008-2009 financial collapse on the State's budget, reviewing the experience over the last 5-years and 10-year period does not provide clear information for assumption selection.

During the last ten years the total population for the state has increased, on average, 1.4% per year over the last 10 years. 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.

Based on this information, we are recommending a 3.00% payroll growth assumption for SCRS and PORS. This is a 0.50% decrease from the current assumption and reflects the 0.50% decrease in the recommended wage inflation assumption. This change will have no impact on the actuarial accrued liability, but will increase the contribution rate needed to amortize the unfunded actuarial accrued liability over the same time period.

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.

The current assumption uses separate mortality tables for: (a) Public School Employees, (b) General Employees, and (c) members in PORS. Of course, we also use separate tables for males and females. Separate tables are also used for disabled retirees; these are discussed in a following subsection. We use different tables for public school employees because our studies have consistently shown that they live longer on average than other state and local government employees. We have historically used mortality assumptions for the uniformed retirees, because the effects of their hazardous occupations were believed to have a negative effect on their life expectancy. However, there has been a reversal of this trend because public safety members often must pass certain physical exams to be considered fit to perform their duties, and evidence suggests that retiree mortality experience of public safety members is closing the gap when compared to retirees of general state and local governments.

Currently, the South Carolina Retirement Systems use a variation of the RP-2000 Combined mortality table for non-disabled retirees. Life expectancy is currently assumed to increase using generational improvement Scale AA, which was released in conjunction with the RP-2000 tables. When the last experience study was performed in 2011, Scale AA was the most current projection table published by the Society of Actuaries. Under Scale AA, mortality rates will improve 0.1% - 2.0% each year, depending on the age and gender of the retiree. The following table provides the life expectancy for individuals retiring in future years based on the current mortality assumption.

Current Life Expectancy Assumption for an Age 65 Retiree in Years					
Group	**Year of Retirement**				
	2010	**2015**	**2020**	**2025**	**2030**
General Employee - Male	19.3	19.6	20.0	20.4	20.7
General Employee - Female	22.1	22.3	22.5	22.7	22.9
Public School Employees - Male	19.2	19.5	19.9	20.3	20.6
Public School Employees - Female	22.1	22.4	22.6	22.8	22.9
PORS - Male	17.4	17.8	18.2	18.6	19.0
PORS - Female	19.4	19.7	19.9	20.1	20.4

The issue of future mortality improvement is one that the governing bodies of our profession have increasingly become more focused on studying and ensuring that the actuarial profession remains on the forefront of this issue. This has resulted in recent changes to the relevant

Actuarial Standard of Practice, ASOP 35, and published practice notes. This ASOP now requires pension actuaries to make and disclose an assumption as to expected mortality improvement after the valuation date. To meet this standard, a recent trend in actuarial models is to use mortality tables that explicitly incorporate projected mortality improvements over time. By doing this, future life expectancy will be projected to continually increase each year in the future. Stated another way, the life expectancy at age 65 for someone reaching 65 now will not be as long as the life expectancy for someone reaching 65 in 2020, and their life expectancy will not be as long as someone reaching 65 in 2040, etc. This method for modeling improvement in life expectancy was incorporated into the South Carolina Retirement Systems during the last experience study conducted in 2011.

Since the last experience study, the Society of Actuaries' Retirement Plans Experience Committee's (RPEC) has also issued a report with more current nationally based mortality tables and improvement assumptions, referred to as RP-2014 (based mortality table) and MP-2014 (improvement assumption).

Analysis of Credibility of the Retirement Systems' Mortality Experience

When selecting an appropriate mortality assumption, actuaries often use standard, published, mortality tables. As the size of the retiree population, actuaries often also adjust these published mortality tables with multipliers or age setbacks, to better reflect characteristics of the covered group, and to provide for expectations of future mortality improvement (both up to and after the measurement date). On the other hand, a retirement system with a sufficiently large number of retirees may be able best model mortality experience using mortality table based on their experience. Factors that may be considered in selecting and/or adjusting a mortality table include the demographics of the retiree group, the number of retirees in the system, the statistical credibility of its experience, and the anticipated rate of future mortality improvement.

In our analysis of the mortality experience for the South Carolina Retirement Systems, we first measured the credibility of the dataset to determine whether standard published tables should be used or if a statistical analysis of the Retirement Systems' data was warranted. Based on a practice note issued by the American Academy of Actuaries in June 2015, a dataset needs 96 expected deaths for each gender to be within +/- 20% of the actual pattern with 95% confidence. However, we believe a +/- 20% range to too large to be considered fully credible, for mortality section. Other sources suggest higher requirements, such as 1,000 deaths per gender is necessary to be considered fully credible. 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

Using this information, 1,082 deaths are needed by gender to have 90% confidence that the data is within +/- 5% of the actual pattern. The South Carolina Retirement Systems (SCRS and PORS) had 5,787 male deaths and 7,502 female deaths during the five-year period ending June 30, 2015. Based on the statistical credibility table, we are 99% confident that we are within 5% and 3% of the true mortality experience for males and females, respectively.

Note, we intentionally used a five-year period for this analysis because while the use of more years of experience would provide more data (and higher credibility), the additional years of experience would temper real changes that have occurred in the mortality assumption due to improvements in life expectancy during the time period.

There are also reasons beyond statistical credibility to determine whether a published table based on national population or a System specific mortality table should be used. Studies on mortality consistently show that longevity can vary significantly among industries, ethnicity, education, and geographic location. For instance, people with formal education beyond high school or a profession degree have a longer life expectancy than people without a formal education beyond high school. However, a Morbidity and Mortality Report issued by the Center for Disease Control on July 19, 2013, states that South Carolina ranks 41st in life expectancy compared to people in the other US States. Due to this large variation in mortality experience, it is unlikely that a nationally published table provides a good fit across the entire age spectrum of the retiree population.

As a result, we concluded it is appropriate to utilize the Retirement System's experience and develop a System specific mortality assumption. Using a system specific mortality assumption will reduce the risk of undervaluing or overvaluing liabilities, provide better future estimates of liabilities and projected benefit payments.

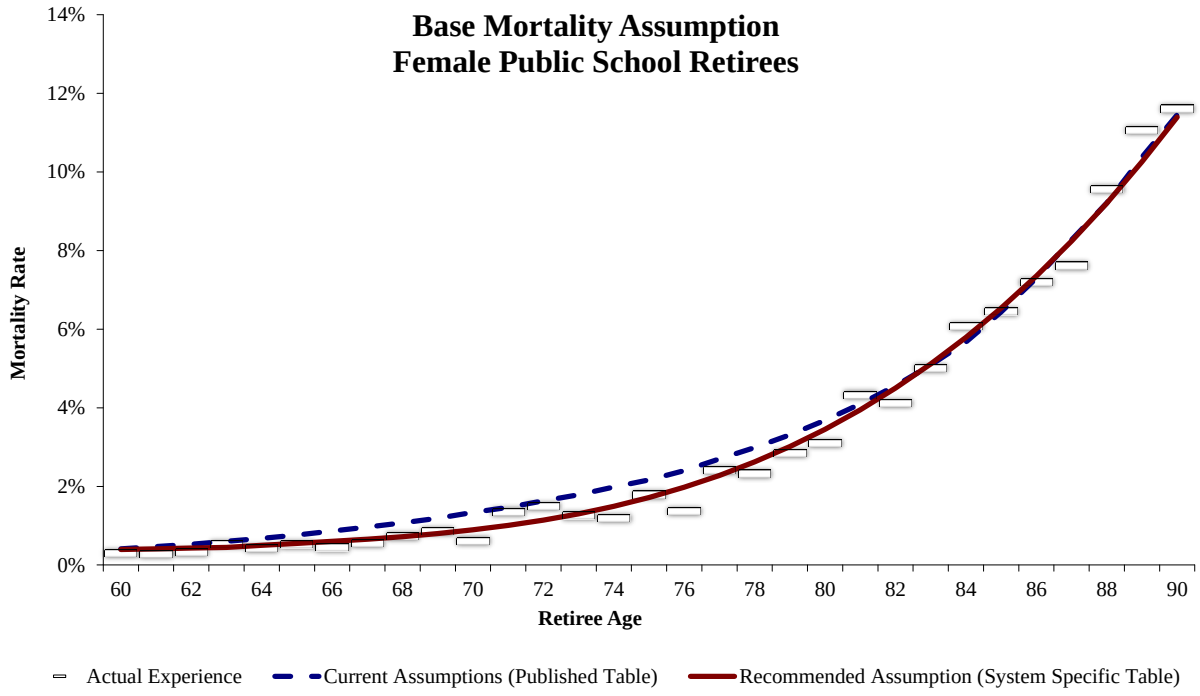
Recommended Base Mortality Assumption

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 RPEC when they develop published mortality tables.

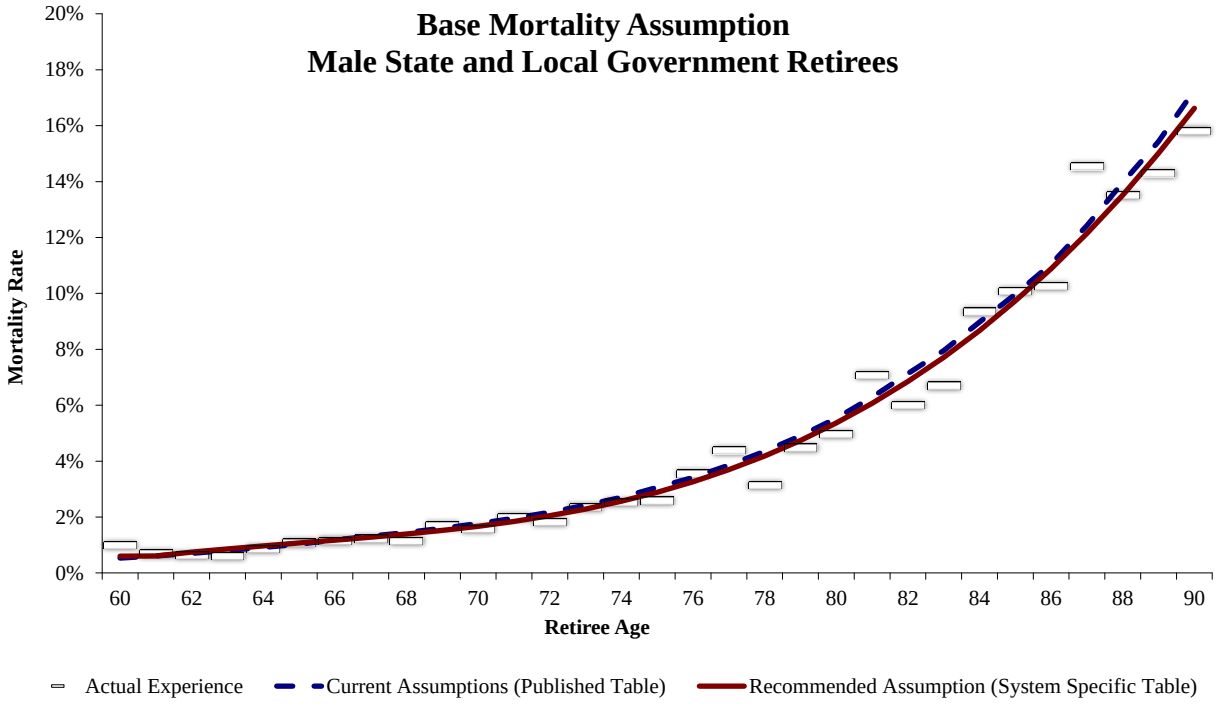
Mortality rates for the core ages of retirees, beyond age 60, are based on the Retirement System's experience, using a polynomial model to provide a smooth fit to the midpoint of the experience. Mortality rates for the outlier ages, ages under 50, are equal to a multiple of the most recently published RP-2014 mortality assumptions (adjusted back to the central point of the experience period using projection scale MP-2014). Finally, the mortality rates for the transitional age ranges, ages 50 to 59, were developed using a cubic spine method to orderly transition between the mortality rates between the core and outlier age ranges.

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 (i.e., the year 2012) to the year 2016 using a mortality improvement assumption. We will refer to this new table as the 2016 Public Retirees of South Carolina Mortality Table (2016 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 based on a published table (RP-2000 Mortality Table), and the mortality rates based on the Retirement Specific Mortality Table. As the chart shows, the current base table provides a reasonable fit at the lower and upper age spectrum. However, the actual mortality experience is less than assumed for ages 65 through 82. The best way to provide a better fit along the entire "curve" is to use an assumption developed using actual experience.



Since the mortality rates in the recommended base tables have slightly lower rates of mortality than the current assumption at certain ages, there will be some increase in liability and cost due to the adoption of this base table. Below is a similar chart showing the same information for male state and local government retirees.



As the chart shows, the actual experience more closely tracked the current assumption using a published mortality table. As a result, the cost impact of changing to a recommended table based on the Systems' experience will be less for male retirees.

Recommended Mortality Improvement Assumption

RPEC recognizes that there is a wide range of opinion with respect to future levels of mortality and that the assumptions underlying mortality improvement reflect some degree of subjectivity. Generational mortality improvement Scale AA will released by the Society of Actuaries along with the release of the RP-2000 mortality tables. In September 2012, RPEC released Generational Scale BB that provides a higher mortality improvement assumption as an alternative to the Scale AA assumption. RPEC has also issued mortality improvement assumptions Scale MP-2014, and Scale MP-2015, in 2014 and 2015, respectively.

The following table provides the life expectancy of a 65 year old retiree developed using the actual experience for SCRS and PORS for the time period 2005-2010 and actual data for the time period 2010-2015. We have also compared the actual increase to the life expectancy to the expected increase assuming Scale AA. We note for completeness, that this analysis is different than comparing the life expectancy based on the current base mortality assumption to the recommended

base mortality assumption. Also, to be consistent with fitting a curve to the crude rates this analysis was performed on a headcount weighted basis.

Group	Public School Employees		PORS		General Employees	
Gender	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Life Expectancy at Age 65 (Years)						
Using data from 2005-2010	18.67	22.04	16.60	N/A	18.20	21.39
Using data from 2010-2015	19.03	22.24	17.12	N/A	18.19	21.36
Actual Increase	0.36	0.20	0.52	N/A	(0.01)	(0.03)
Expected Increase (Scale AA)	0.37	0.22	0.42	N/A	0.37	0.22

As the table shows, the actual increase in life expectancy for public school employees (male and female) was consistent with improvement assumption Scale AA. Life expectancy for members in PORS was greater than expected. We are not surprised by this since their overall life expectancy is the lowest for this group, thus providing the greatest opportunity for improvement. The life expectancy for state and local government employees remained relatively unchanged.

Stakeholders should note when reading this information that actual improvements in mortality rarely occur in a linear manner, as assumed. Rather, there will be time period when mortality improves faster (and slower) than assumed. Therefore, it would be inappropriate to conclude that since life expectancy did not improve over the last five years for state and local government retirees, there will not be any future improvements in their life expectancy. To identify actual trends in mortality improvement is better suited using multiple decades of experience.

Given this information, we are recommending a new base table that is based on the Retirement System's experience and continued use of improvement Scale AA.

Recommended Non-Disabled Mortality Assumption

Below are the specific mortality assumptions:

State and Local Government Retirees:
Males: 2016 PRSC for Males multiplied by 100%
Females: 2016 PRSC for Females multiplied by 111%

Public School Employees:
Males: 2016 PRSC for Males multiplied by 92%
Females: 2016 PRSC for Females multiplied by 98%

Retirees in PORS:
Males: 2016 PRSC for Males multiplied by 125%
Females: 2016 PRSC for Females multiplied by 111%

The mortality assumption will improve using projection Scale AA from the year 2016.

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	20.2	20.5	20.9	21.2	21.5
General Employee - Female	22.3	22.5	22.7	22.9	23.1
Public School Employees - Male	20.8	21.1	21.5	21.8	22.1
Public School Employees - Female	23.3	23.5	23.6	23.8	24.0
PORS - Male	18.5	18.9	19.3	19.6	20.0
PORS - Female	22.3	22.5	22.7	22.9	23.1

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, 2015			
		Current Assumption	
Retirement System	Actual	Expected	A/E
JSRS	17	24	71%
GARS	46	52	88%
SCNG	558	722	77%

However, 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 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-2000 Disabled Mortality table, with various multipliers applied to the different employee groups and genders to provide an appropriate fit to the experience.

The analysis shows that the current assumption tracked reasonably well to the current assumption tracked reasonably to the experience. However, we recommend updating this assumption as a new published disabled mortality table has been published by the Society of Actuaries. Specifically, we recommend using the RP-2014 Disabled Mortality table, with a 125% multiplier applied to both male and female rates for general employees and public school employees. An 85% multiplier was applied to the PORS assumption. We also recommend using improvement Scale AA, the same mortality improvement assumption that is used for non-disabled retirees.

Mortality Experience for Disabled Retirees for the Five-Year Period Ending June 30, 2015					
		Current		Recommended	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	699	650	108%	668	105%
General Employee - Female	665	687	97%	663	100%
Public School Employees - Male	212	185	115%	208	102%
Public School Employees – Female	650	690	94%	640	102%
PORS – Males	130	138	94%	131	100%
PORS – Female	29	21	138%	25	116%

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 date 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 107-112.

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-2000 Mortality Table for Employees, with multipliers applied to provide a better fit for the various employee groups and genders. Since the mortality rates are so small, we currently do not apply the mortality improvement scale, like is used for the mortality assumption for retirees.

We recommend the continued use of a static table, but adopt a new static table, the RP-2014 Mortality Table for Employees. We also recommend the application of a 95% multiplier for all employee groups and genders (85% multiplier for female public school employees) to provide an appropriate fit and margin for future improvement in experience.

Details are shown in Section X on pages 113-118.

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. While there was a slight delay in the classification of a few retirees as disabled, we believe the difference was not sufficient enough to include any adjustments to the observed experience or the recommended rates of disability. 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, 2015.

Number of Disability Incidences for the Five-Year Period Ending June 30, 2015					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	848	810	105%	810	105%
General Employee - Female	1,061	1,040	102%	1,040	102%
Public School Employees - Male	275	250	110%	250	110%
Public School Employees - Female	1,118	1,203	110%	1,203	110%
PORS – Males and Females	652	554	118%	696	94%

The number of disabilities over the last five years was slightly greater than expected for SCRS. We expected this because the pension reform legislation (Act 278) changed the disability eligibility provisions and made it more restrictive for members to receive a disability retirement. While the new eligibility provisions effective January 1, 2014, the anticipated decrease in the number of disability instances have already been reflected in the current assumption.

Based on the three years prior to the change in eligibility, there were approximately 570 disability retirements per year. Under the new eligibility provisions, there have been approximately 410 disability retirements per year. We expect future experience will be more consistent with the current assumptions. Therefore, we do not recommend a change to the disability assumption for SCRS at this time.

Act 278 also changed the disability eligibility provisions for PORS. However, legislation in the following year rescinded that change before it became effective. Therefore, we believe the historical experience is fully credible and representative of futures rates of disability. Therefore, we recommend increasing the disability rates to be more consistent with historical experience.

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 119-123.

TERMINATION RATES

Termination rates reflect members who leave 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 age, 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. Below is a table with a summary of the results for the termination rates by employee group and gender:

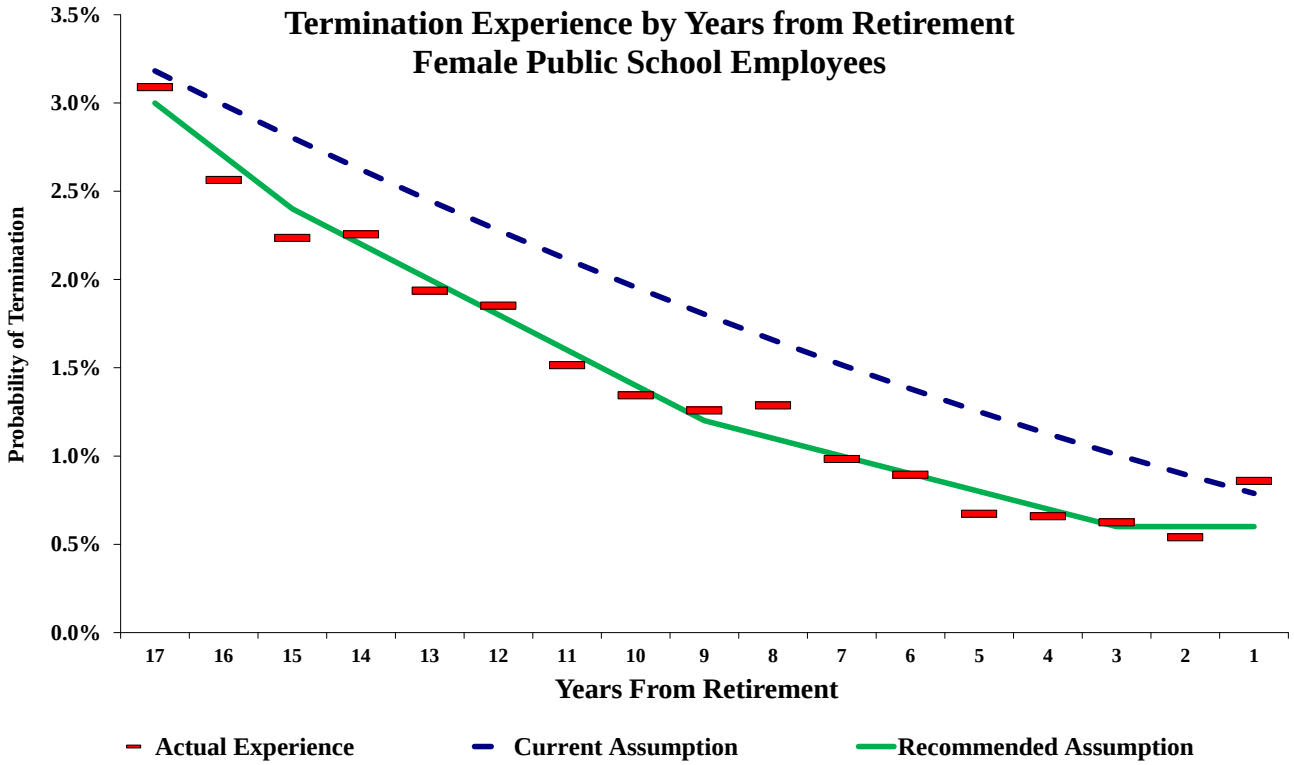
($ in thousands of payroll)

General Employees					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
Male	$701,675	$781,383	90%	$691,725	101%
Females	1,237,272	1,186,552	104%	1,202,999	103%

Public School Employees					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
Male	$292,541	$301,950	97%	$292,673	100%
Females	877,069	935,466	94%	878,310	100%

As the tables show, the rates of termination were slightly decreased for both employee groups and genders. 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 still 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 slightly fewer terminations than expected, especially for members with more than 10 years of service. Reducing the termination probabilities will increase the number of projected members who will continue employment to retirement age. As a result, the Systems will experience some increase in liability and cost as a result of this recommend assumption change. Details of the termination experience for SCRS are provided in Section X on pages 124-131.

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 101.

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. Also, experience during the last five year period supports this assumption. We recommend to continue assuming 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 lose 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.

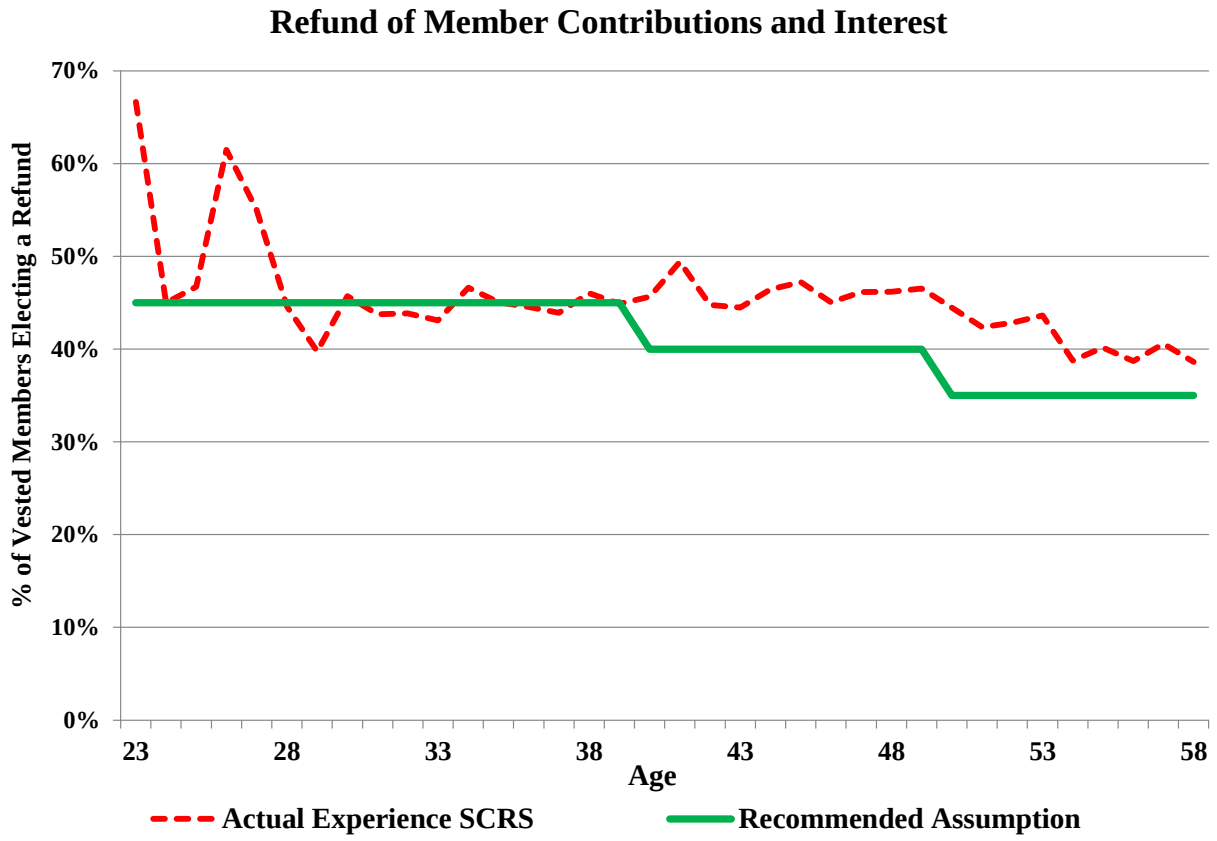
The actuarial valuation for the SCNG currently has a 10% per year termination assumption for members under age 60 with between 20 and 30 years of service. Experience for the last five years shows that fewer members terminate employment than currently expected (99 actual vs 658 expected). While the difference between the expected and actual occurrences may seem large, we do not believe the historical experience is fully creditable due to the relatively small number of terminations unexplained data anomalies that are observed in the valuation data. Therefore, we are recommending a decrease to the termination rates, but not to the extent shown in the analysis. Specifically, we recommend decreasing rate of terminations to 2.50% per year for members with 20 to 24 years of service and 5.0% per year for members with 25 to 29 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 withdrawal their member contributions at any time and forfeit the monthly annuity. Currently, the valuations for SCRS and PORS assume that members will refund their contributions if the value of their member contributions exceeds the value of their deferred monthly retirement benefit.

The 2012 legislation increased the member contribution rates, which will result in even greater membership 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 will result in many employees choosing to take a refund, even when it may be less valuable than the deferred monthly benefit. Therefore, we recommend making 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. 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.



Since the rate of turnover for members in PORS are much lower than for members in in SCRS, the refund assumption is less relevant for PORS (compared to SCRS). Therefore, we do not recommend a change in continued use of the current assumption for that System.

Note, while the recommended explicit assumption is based on historical experience, it is possible there will be some increase in the percentage of members who elect a refund of their contributions and interest, as member contribution rates increase in the future.

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 is predominately driven by the member's service, 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, 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. Members hired after June 30, 2012 in SCRS and PORS are Class Three members, and have different retirement eligibility and benefit provisions. There are separate retirement assumptions that are applied to these members. 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.

Members hired prior to July 1, 2012 are generally Class Two members (there may be a few Class One members still earning retirement benefits). The pension reform legislation included changed to certain retirement provisions for these members too. First, beginning January 1, 2013 the Retirement System became more restrictive in allowing members who retire under age 62 (age 57 for PORS) to return to work with a participating employer and concurrently receive their retirement allowance. Secondly, the Teacher and Employee Retention Incentive Program (TERI) will be phased-out such that no members may participate in the program after June 30, 2018. When the pension reform bill was enacted, the retirement assumption was modified to reflect the long-term anticipated retirement behavior.

As a result of these changes we must be careful in how we use the historical experience for predicating future retirement behavior. For this analysis we only used the last two years of experience, or experience from July 1, 2013 through June 30, 2015. Experience prior to this date is not reliable for setting actuarial assumptions due to the significant benefit changes that occurred in January 2013. For example, there were 7,028 members who retired from July 1, 2012 through January 1, 2013, but only 1,547 members who retired from January 2, 2013 through June 30, 2013. However, 60% of the 7,028 members started their retirement benefit in the last half of 2012 continued to remain in the workforce.

The chart below shows the actual retirements as well as the expected retirements under the current and proposed assumptions for the various membership groups:

($ in thousands of Liability)

Reduced Retirements for the Two-Year Period Ending June 30, 2015					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	$50,524	$21,953	230%	$48,662	104%
General Employee - Female	225,083	89,695	251%	194,783	116%
Public School Employees - Male	107,810	80,354	134%	139,799	77%
Public School Employees - Female	164,735	122,080	135%	197,449	83%

While members eligible for a reduced retirement benefit may elect to participate in TERI, we believe the last two years of experience provide sufficient credible experience for adjusting the assumed rates of retirement for those who retire with a reduced retirement allowance. Note, this assumption is less significant than the rates of retirement with an unreduced benefit because the majority of employees work until they are eligible for an unreduced retirement benefit.

Unreduced Retirements for the Two-Year Period Ending June 30, 2015					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
General Employee - Male	$815,262	$523,384	156%	$523,384	156%
General Employee - Female	528,615	403,457	131%	403,457	131%
Public School Employees - Male	131,195	43,745	305%	43,100	305%
Public School Employees - Female	625,500	258,357	242%	258,357	242%
PORS – Males and Females	243,582	254,898	96%	253,917	96%

As the table above shows, there were more retirements than expected for SCRS during the two-year period ending June 30, 2015. However, since TERI is still open through June 30, 2018, we do not believe the last two years of experience is credible for recommending a change to the retirement rates. For example, approximately 33% of the members who retired during this time period are participating in TERI. When TERI is no longer available, we believe members will increase the utilization of the provision that allows members who retire after age 62 to commence their retirement allowance and concurrently seek reemployment. However, note that the retirement

behavior appears to be service based (i.e. members retire relatively shortly after attaining 28 years of service, regardless of age), so increases to the retirement rates when a member attains 28 years of service may be required in the next experience study.

Members in PORS are not permitted to participate in TERI. Therefore, we believe this system's experience for the last two years is more credible for making adjustments to the current retirement assumption. The overall number of PORS members that retired was slightly less than expected. The recommended retirement rates do not materially change the number of retirements, but do better reflect the membership's behavior. Namely, we observed there were more than expected members retiring soon after attaining 25 years of service, and fewer than expected members are retiring than expected after age 57, the first age they are able to commence their retirement benefit and continue employment. As a result, we have reduced the retirement rate at age 57 and increased the retirement rate when the member attains 25 years of service. Other modifications to the retirement assumption were less significant.

Details of the retirement experience for Class Two members are shown in Section X pages 133-142.

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

The 2012 pension reform changes did not impact the retirement behavior for members in JSRS, GARS, or the SCNG. Therefore, we used the last five years of experience for reviewing the retirement assumption for these groups. Similar to SCRS and PORS, a liability weighting approach 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, 2015					
		Current Assumption		Recommended Assumption	
Group	Actual	Expected	A/E	Expected	A/E
JSRS	$31,361	$45,524	69%	$44,333	71%
GARS	34	30	113%	39	87%

Note: The experience for JSRS was measured on a liability weighted basis. The experience for GARS was measured on a headcount basis.

The design of these retirement systems has a significant influence on retirement behavior. For example, the retirement benefit is capped at 90% of pay for the Judges in JSRS 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. After reviewing the experience, we modified the structure of the retirement assumption to be a service only assumption (with a 100% retirement at the mandatory retirement age of age 72). The overall rates of retirement were not materially changed.

We continued to use an age based retirement structure for GARS. The rates of retirement were increased across all ages to better reflect anticipated experience.

There was no change to the retirement rates for members in the SCNG. The actuarial valuation of the SCNG will continue to assume that 100% of the members will retire upon attaining age 60 or 30 or more 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 143-145.

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, the likelihood that a terminating employee will take a refund, 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 current method for determining the actuarial value of assets recognizes 20% of the difference between the expected actuarial value of assets and actual market value of assets. This is often referred to as a modified five-year asset smoothing method. This method was adopted in 2011 because it

recognized investment gains and losses over a shorter number of years than the 10-year asset smoothing method in use in 2010 actuarial valuation. However, when there a single year with a relatively large investment loss or multiple consecutive years of investment losses, the number of years to recognize those investment losses under this method may take longer than five years.

As a result, we are recommending a modification in the asset method to use a five-year asset smoothing method that will identify the investment gain or loss that occurs each year on a market value of asset basis, recognize that amount at the rate of 20% per year. This will ensure that no investment gain or loss will be deferred by more than five years. This asset method is also the most common asset valuation method used by large public retirement systems. The change in the actuarial value of asset method would be applied on a prospective basis and would not have an immediate impact on the unfunded actuarial accrued liability or contribution rates.

The recommended method will continue 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.

FUNDING POLICY

South Carolina State Code specifies how the contribution rates for SCRS and PORS are determined, as well as providing some discretionary flexibility for the PEBA Board to provide additional increases in the contribution rates. After new assumptions have been adopted, including the finalization of the investment return assumption, the PEBA Board may wish to investigate the implications of additional increases to the contribution rates and develop a policy to make it transparent to stakeholders when further increases in the contribution rates would be adopted. We believe this investigation is outside the scope of this experience study and would be premature without knowing the assumptions, including the investment return assumption, which will be used in future actuarial valuations.

The funding period for GARS in the next actuarial valuation (i.e. July 1, 2016 valuation) will be 11 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 that when the closed period for amortizing the unfunded actuarial accrued liability becomes less than 10 years, each subsequent years' *new* gains and losses are separately amortized over a closed, 10-year period (i.e. use a layered amortization base approach). Since the SCNG is also funded over a closed period, we recommend the same policy for determining the contribution requirements for the SCNG. However, since the current period for funding gains and losses in the SCNG is 21 years, it will be more than 10 years before this recommendation will have an impact in determining contribution requirements.

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. This experience study was conducted for the five-year period ending June 30, 2015. Most large public retirement systems conduct experience studies every four or five years, although there are a few systems that conduct experience studies every three years. As a result of the new pension accounting standards (GASB Statements No. 67 and 68), retirement systems are under increased scrutiny by the external auditors of retirement system and independent auditors of the employers that participate in these systems which include the appropriateness of the assumptions used in the actuarial valuation. Therefore, we recommend PEBA to begin conducting future experience studies on four year intervals, with the next experience study be for the four-year period year ending June, 30, 2019. Also, to allow sufficient time for decision makers to review and adopt the recommended assumptions, we suggest the next experience study report be delivered to the Public Employee Benefit Authority in the summer of 2020.

SECTION IV

ACTUARIAL IMPACT OF RECOMMENDATIONS

Estimated Actuarial Impact of Recommendations

The following pages provide the actuarial impact of the recommended assumptions for each retirement system based on the July 1, 2015 actuarial valuation. In actuality, these recommended assumptions will be first used when preparing the July 1, 2016 actuarial valuation, which identifies the employer and member contribution requirements for the year beginning July 1, 2018 and ending June 30, 2019 (FYE 2019).

For informational purposes, the tables show the changes in the contribution requirement and the unfunded actuarial accrued liability due to each of the recommended assumption changes. We believe the Board's decision about whether or not to adopt our recommendations should be based not only on the appropriateness of each recommendation individually but also on the collective effect on the contribution rate or the actuarial liabilities. Stated another way, we do not recommend changes in individual assumptions be selectively picked based on their financial impact.

It is also important to note that since the asset method is currently deferring investment losses and there are investment losses expected to occur in FY 2016, we expect investment losses will be realized in the July 1, 2016. Those investment losses have not been reflected in the pro forma information shown on the following pages. As a result, it is reasonable to expect the actuarially determined contribution rates determined in the July 1, 2016 actuarial valuation will be greater than the amounts shown in these tables.

Fiscal Impact SCRS

Liability Measure	30-Year Employer Contribution Rate	Unfunded Actuarial Accrued Liability (AVA Basis) ($ in millions)	Funded Ratio (AVA / AAL)
(1)	(2)	(3)	(4)
1. July 1, 2015 Valuation (Current Assumptions)	11.09%	$ 16,753	62.0%
2. Increase/(Decrease) due to:			
- Mortality	0.31%	$ 760	-1.0%
- Withdrawal/Turnover	0.14%	96	-0.2%
- Retirement	0.05%	88	-0.1%
- Disability	0.02%	(1)	0.0%
- Individual Salary Increases	-0.33%	(403)	0.6%
- Payroll Growth Assumption	0.30%	0	0.0%
- 7.25% Investment Return	0.56%	1,270	-1.8%
- Increased refunds due to higher member contributions[1]	0.14%	(171)	0.3%
Net Changes:	1.19%	$ 1,639	-2.2%
3. July 1, 2015 Valuation (Recommended Assumptions)	12.28%	$ 18,392	59.8%
4. FY 2018 employer contribution rate:	11.09%		
5. Increase in employer contribution rate (item 4. - item 3.):	1.19%		

6. Projected FY 2018 Contribution	Employer	Members
- Current Assumptions	$ 1,124,780,000	$ 771,342,000
- Recommended Assumptions	1,238,171,000	873,141,000
- Increase	$ 113,391,000	$ 101,799,000

[1] The effect of increasing the member contribution rate from 8.19% to 9.38% under the recommended assumptions. The increase in the member contribution rate will increase the refunds for nonvested members and vested members who elect a refund of their member contributions. This results in some increased cost to the system.

Fiscal Impact PORS

Liability Measure	30-Year Employer Contribution Rate	Unfunded Actuarial Accrued Liability (AVA Basis) ($ in millions)	Funded Ratio (AVA / AAL)
(1)	(2)	(3)	(4)
1. July 1, 2015 Valuation[1] (Current Assumptions)	13.53%	$ 1,895	69.2%
2. Increase/(Decrease) due to:			
- Mortality	0.43%	$ 133	-1.4%
- Withdrawal/Turnover	0.00%	0	0.0%
- Retirement	-0.07%	(18)	0.2%
- Disability	0.08%	3	-0.1%
- Individual Salary Increases	-0.34%	(72)	0.8%
- Payroll Growth Assumption	0.26%	0	0.0%
- 7.25% Investment Return	0.77%	193	-2.0%
- Increased refunds due to higher member contributions[2]	0.13%	(18)	0.1%
Net Changes:	1.26%	$ 221	-2.4%
3. July 1, 2015 Valuation (Recommended Assumptions)	14.79%	$ 2,116	66.8%
4. FY 2018 employer contribution rate:	13.74%		
5. Increase in employer contribution rate (item 4. - item 3.):	1.05%		

6. Projected FY 2018 Contribution	Employer	Members
- Current Assumptions	$ 181,436,000	$ 115,411,000
- Recommended Assumptions	195,301,000	129,276,000
- Increase	$ 13,865,000	$ 13,865,000

[1] The 13.53% employer contribution rate is the 30-year funding rate. The actual employer contribution rate in effect for the System is 13.74% and has a 27 year funding period.

[2] The effect of increasing the member contribution rate from 8.74% to 9.79% under the recommended assumptions. The increase in the member contribution rate will increase the refunds for nonvested members and vested members who elect a refund of their member contributions. This results in some increased cost to the system.

Fiscal Impact JSRS

	Liability Measure	30-Year Employer Contribution Rate	Unfunded Actuarial Accrued Liability (AVA Basis) ($ in thousands)	Funded Ratio (AVA / AAL)
	(1)	(2)	(3)	(4)
1.	July 1, 2015 Valuation[1] (Current Assumptions)	46.22%	$ 111,692	58.6%
2.	Increase/(Decrease) due to:			
	- Mortality	3.80%	$ 10,754	-2.3%
	- Withdrawal/Turnover	0.00%	0	0.0%
	- Retirement	0.98%	1,939	-0.4%
	- Disability	0.46%	122	0.0%
	- Individual Salary Increases / COLA	-3.34%	(7,211)	1.5%
	- Payroll Growth Assumption	0.89%	0	0.0%
	- 7.25% Investment Return	3.39%	7,031	-1.4%
	Net Changes:	6.18%	$ 12,635	-2.6%
3.	July 1, 2015 Valuation (Recommended Assumptions)	52.40%	$ 124,327	56.0%
4.	FY 2018 employer contribution rate:	47.97%		
5.	Increase in employer contribution rate (item 4. - item 3.):	4.43%		

		Employer	Members
6.	Projected FY 2018 Contribution		
	- Current Assumptions	$ 10,823,000	$ 2,245,000
	- Recommended Assumptions	11,765,000	2,245,000
	- Increase	$ 942,000	$ 0

[1] The 46.22% is the employer contribution rate based on a 30-year funding period. The actual employer contribution rate in effect for the System is 47.97% and has a 27 year funding period.

Fiscal Impact GARS

Liability Measure	Employer Contribution ($ in thousands)	Unfunded Actuarial Accrued Liability (AVA Basis) ($ in thousands)	Funded Ratio (AVA / AAL)
(1)	(2)	(3)	(4)
1. July 1, 2015 Valuation (Current Assumptions)	$ 4,777	$ 37,196	50.1%
2. Increase/(Decrease) due to:			
- Mortality	$ 475	$ 2,990	-2.0%
- Withdrawal/Turnover	0	0	0.0%
- Retirement	61	267	-0.1%
- Disability	1	1	0.0%
- Individual Salary Increases	N/A	N/A	N/A
- Payroll Growth Assumption	N/A	N/A	N/A
- 7.25% Investment Return	233	1,715	-1.1%
Net Changes:	$ 769	$ 4,973	-3.2%
3. July 1, 2015 Valuation (Recommended Assumptions)	$ 5,546	$ 42,169	46.9%

Fiscal Impact SCNG

Liability Measure	Employer Contribution ($ in thousands)	Unfunded Actuarial Accrued Liability (AVA Basis) ($ in thousands)	Funded Ratio (AVA / AAL)
(1)	(2)	(3)	(4)
1. July 1, 2015 Valuation (Current Assumptions)	$ 4,509	$ 36,414	41.4%
2. Increase/(Decrease) due to:			
- Mortality	$ 164	$ 1,511	-1.0%
- Withdrawal/Turnover	0	0	0.0%
- Retirement	131	673	-0.4%
- Disability	(31)	(74)	0.0%
- Individual Salary Increases	N/A	N/A	N/A
- Payroll Growth Assumption	N/A	N/A	N/A
- 7.25% Investment Return	19	967	-0.6%
Net Changes:	$ 284	$ 3,077	-2.0%
3. July 1, 2015 Valuation (Recommended Assumptions)	$ 4,793	$ 39,491	39.4%

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

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

Rates of Annual Salary Increase

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

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

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

Active Member Decrement Rates

a. Assumed rate of Service Retirement or TERI entry are shown in the following tables. The first table is for members who attain age 65 before attaining 28 years of service. The second table is based on service and is for members who attain 28 years of service before age 65.

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

* Retirement rate 50% 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.

Annual Service Based Retirement Rates*				
Class Two Members				
Years of Service	General Employees		Teachers	
	Male	Female	Male	Female
28	15%	18%	7%	8%
29	10%	10%	8%	9%
30	10%	10%	8%	9%
31	10%	10%	9%	10%
32	10%	10%	10%	11%
33	18%	20%	11%	12%
34	18%	20%	12%	18%
35	18%	20%	13%	18%
36	20%	20%	14%	18%
37	20%	20%	18%	18%
38	20%	20%	17%	19%
39	20%	20%	17%	20%
40	100%	100%	100%	100%
41	100%	100%	100%	100%
42	100%	100%	100%	100%
43	100%	100%	100%	100%
44	100%	100%	100%	100%
45	100%	100%	100%	100%
46	100%	100%	100%	100%
47	100%	100%	100%	100%
48	100%	100%	100%	100%

* Retirement rate 50% 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.

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

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

c. Active Member Mortality

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

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

d. Rates of Withdrawal

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

Withdrawal Rates - Male General Employees															
Age	**Years of Service**														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.040	0.000	0.000	0.000	0.000
30	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.040	0.040	0.037	0.034	0.031
35	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.040	0.040	0.037	0.034	0.031
40	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.034	0.034	0.034	0.034	0.031
45	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.031	0.031	0.029	0.026	0.023
50	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.020	0.020	0.020	0.020	0.020
55	0.200	0.175	0.123	0.103	0.090	0.085	0.071	0.064	0.055	0.050	0.010	0.010	0.010	0.010	0.010
60	0.200	0.175	0.123	0.103	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Age	**Years of Service (Continued)**													
	15	16	17	18	19	20	21	22	23	24	25	26	27	28+
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	0.029	0.026	0.023	0.020	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.029	0.026	0.023	0.020	0.018	0.015	0.013	0.011	0.010	0.009	0.008	0.000	0.000	0.000
45	0.020	0.020	0.020	0.020	0.018	0.015	0.013	0.011	0.010	0.009	0.008	0.007	0.006	0.000
50	0.020	0.018	0.015	0.013	0.011	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.000
55	0.010	0.010	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.000	0.000	0.000	0.000
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Withdrawal Rates - Female General Employees

Age	Years of Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.046	0.000	0.000	0.000	0.000
30	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.046	0.046	0.042	0.038	0.034
35	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.046	0.046	0.042	0.038	0.034
40	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.038	0.038	0.038	0.038	0.034
45	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.034	0.034	0.030	0.026	0.023
50	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.020	0.020	0.020	0.020	0.020
55	0.230	0.217	0.141	0.118	0.101	0.097	0.084	0.075	0.067	0.057	0.012	0.012	0.012	0.012	0.012
60	0.230	0.217	0.141	0.118	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Age	Years of Service (Continued)													
	15	16	17	18	19	20	21	22	23	24	25	26	27	28+
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	0.030	0.026	0.023	0.020	0.018	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.030	0.026	0.023	0.020	0.018	0.016	0.014	0.013	0.012	0.011	0.010	0.000	0.000	0.000
45	0.020	0.020	0.020	0.020	0.018	0.016	0.014	0.013	0.012	0.011	0.010	0.009	0.008	0.000
50	0.020	0.018	0.016	0.014	0.013	0.012	0.012	0.012	0.012	0.011	0.010	0.009	0.008	0.000
55	0.012	0.012	0.012	0.012	0.012	0.012	0.011	0.010	0.009	0.008	0.000	0.000	0.000	0.000
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Withdrawal Rates - Male Teachers

Age	Years of Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.000	0.000	0.000	0.000
30	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.030	0.030	0.029	0.028
35	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.030	0.030	0.029	0.028
40	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.029	0.029	0.029	0.028
45	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.028	0.027	0.026	0.024
50	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.022	0.022	0.022	0.022
55	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.013	0.013	0.013	0.013
60	0.000	0.217	0.145	0.117	0.098	0.083	0.071	0.061	0.050	0.042	0.039	0.008	0.008	0.008	0.008

Age	Years of Service (Continued)													
	15	16	17	18	19	20	21	22	23	24	25	26	27	28+
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	0.027	0.026	0.024	0.022	0.020	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.027	0.026	0.024	0.022	0.020	0.017	0.015	0.014	0.013	0.012	0.011	0.000	0.000	0.000
45	0.022	0.022	0.022	0.022	0.020	0.017	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.000
50	0.022	0.020	0.017	0.015	0.014	0.013	0.013	0.013	0.013	0.012	0.011	0.010	0.009	0.000
55	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.011	0.010	0.009	0.008	0.008	0.008	0.000
60	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008				0.000

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

Post Retirement Mortality

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

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

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

Life Expectancy for an Age 65 Retiree in Years				
	Year of Retirement			
Gender	2020	2025	2030	2035
Public School Retirees				
Male	20.8	21.1	21.5	21.8
Female	23.3	23.5	23.6	23.8
State and Local Government Retirees				
Male	20.2	20.5	20.9	21.2
Female	22.3	22.5	22.7	22.9

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

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

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for 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 benefites 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 post July 1, 2005 TERI participants, 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.

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, the service of active members who retire is increased 3 months.

Future Cost-of-living Increases

Benefits are assumed to increase 1% annually beginning on the July 1st following the receipt of 12 monthly benefit payments.

Payroll Growth Rate

The total annual payroll of active members (also applies to TERI, ORP and rehired retiree participants) is assumed to increase at an annual rate of 3.00%. This rate represents the underlying expected annual rate of wage inflation and does not anticipate increases in the number of members. The number rehired retirees is expected to decrease over the next 5-7 years, then remain constant to reflect the pension reform legislation enacted in 2012.

Other Assumptions

1. The normal cost rate is increased by 0.12% 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 active employees, TERI, 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.

2. Individual salaries used to project benefits: Actual salaries from the past fiscal year are used to determine the final average salary as of the valuation date. For future salaries, a the salary from the last fiscal year is projected forward with one year's salary scale.

3. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported salaries represent amounts paid to members during the year ended on the valuation date.

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

5. 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.

6. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.

7. Inactive Population: All non-vested members are assumed to take an immediate refund. Vested 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: 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.

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 city 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.

Changes from Prior Valuation

Changes in the assumptions were made based on the 2016 Experience Study.

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

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

Rates of Annual Salary Increase

Rates of annual salary increase are assumed to vary for the first 14 years of service to include anticipated merit and promotional increases. The assumed annual rate of increase is 3.50% for all members with 15 or more years of service.

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

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

Active Member Decrement Rates

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

Annual Age Based Retirement Rates		
Age	PORS	
	Male	Female
55	20%	20%
56	20%	20%
57	20%	20%
58	10%	10%
59	10%	10%
60	10%	10%
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	100%	100%
71	100%	100%
72	100%	100%
73	100%	100%
74	100%	100%
75	100%	100%
76	100%	100%
77	100%	100%

Annual Service Based Retirement Rates			
Years of Service		PORS	
Class Two	Class Three	Male	Female
25	27	40%	40%
26	28	10%	10%
27	29	10%	10%
28	30	10%	10%
29	31	10%	10%
30	32	10%	10%
31	33	10%	10%
32	34	10%	10%
33	35	10%	10%
34	36	10%	10%
35	37	10%	10%
36	38	10%	10%
37	39	10%	10%
38	40	10%	10%
39	41	10%	10%
40	42	100%	100%

b. Assumed rates of disability are shown in the following table. 25% of disabilities are assumed to be duty-related.

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

c. Active Member Mortality

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

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

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

Post Retirement Mortality

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

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

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				
	Year of Retirement			
Gender	2020	2025	2030	2035
Male	18.5	18.9	19.3	19.6
Female	21.4	21.6	21.8	22.0

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

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

Asset Valuation Method

The actuarial value of assets is equal to the market value, adjusted for 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 benefites 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.

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, the service of active members who retire is increased 3 months.

Future Cost-of-living Increases

Benefits are assumed to increase 1% annually beginning on the July 1st following the receipt of 12 monthly benefit payments.

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 3.00%. 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 5-7 years, then remain constant to reflect the pension reform legislation enacted in 2012.

Other Assumptions

1. The normal cost rate is increased by 0.12% 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.

2. Individual salaries used to project benefits: Actual salaries from the past fiscal year are used to determine the final average salary as of the valuation date. For future salaries, a the salary from the last fiscal year is projected forward with one year's salary scale.

3. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported salaries represent amounts paid to members during the year ended on the valuation date.

4. Percent married: 100% of male and 100% of female employees are assumed to be married.

5. Age difference: 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.

6. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.

7. Inactive Population: All non-vested members are assumed to take an immediate refund. Vested 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.

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 city 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.

Changes from Prior Valuation

Changes in the assumptions were made based on the 2016 Experience Study.

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

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

Rates of Annual Salary Increase

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

Active Member Decrement Rates

a. Assumed rates of service retirement are shown in the following table. In addition to the rates in the table below, all participants are assumed to retire upon reaching the mandatory retirement age of 72.

Service Based Retirement Rates		
Years of Service	**Male**	**Female**
15	10%	10%
16	10%	10%
17	10%	10%
18	10%	10%
19	10%	10%
20	40%	40%
21	40%	40%
22	40%	40%
23	40%	40%
24	40%	40%
25	15%	15%
26	15%	15%
27	15%	15%
28	15%	15%
29	15%	15%
30	15%	15%
31*	15%	15%
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	0.0419%	0.0458%	0.0460%	0.0147%
30	0.0629%	0.0616%	0.0429%	0.0185%
35	0.0838%	0.0616%	0.0497%	0.0243%
40	0.1572%	0.1074%	0.0597%	0.0337%
45	0.2620%	0.2200%	0.0924%	0.0558%
50	0.4192%	0.3520%	0.1602%	0.0937%
55	0.6812%	0.5720%	0.2649%	0.1422%
60	1.0480%	0.8800%	0.4454%	0.2076%
64	1.3100%	1.1000%	0.7008%	0.2881%
Multiplier	105%	88%	95%	85%

Post Retirement Mortality

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

Nondisabled Annuitant Mortality Rates (Multiplier Applied)		
Age	**Males**	**Females**
50	0.1875%	0.1284%
55	0.2949%	0.2177%
60	0.5394%	0.3765%
65	0.9382%	0.5230%
70	1.4461%	0.8511%
75	2.5019%	1.6363%
80	4.6454%	3.2910%
85	8.4266%	6.2277%
90	14.6319%	10.9026%
Multiplier	92%	98%

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				
	Year of Retirement			
Gender	2020	2025	2030	2035
Male	**20.8**	**21.1**	**21.5**	**21.8**
Female	**23.3**	**23.5**	**23.6**	**23.8**

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

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

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 2.75%.

Payroll Growth Rate

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

Other Assumptions

1. The normal cost rate is increased by 0.08% 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 and 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 city 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 7.25% net of investment and administrative expenses composed of a 2.25% inflation component and a 5.00% real rate of return, net of investment expenses.

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

Rates of Annual Salary Increase

No increases in salary are assumed.

Active Member Decrement Rates

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

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

GARS				
Age	**Disability Rates**		**Active Mortality Rates (multiplier added)**	
	Males	**Females**	**Males**	**Females**
25	0.0504%	0.0440%	0.0460%	0.0164%
30	0.1008%	0.0616%	0.0429%	0.0207%
35	0.1512%	0.1232%	0.0497%	0.0272%
40	0.2520%	0.1584%	0.0597%	0.0376%
45	0.3528%	0.2288%	0.0924%	0.0624%
50	0.5040%	0.3872%	0.1602%	0.1047%
55	0.8064%	0.6160%	0.2649%	0.1589%
60	1.0080%	0.9416%	0.4454%	0.2320%
64	1.2600%	1.3112%	0.7008%	0.3220%
Multiplier	101%	88%	95%	95%

Post Retirement Mortality

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

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

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				
	Year of Retirement			
Gender	2020	2025	2030	2035
Male	20.2	20.5	20.9	21.2
Female	22.3	22.5	22.7	22.9

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

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

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 account for administrative expenses that are paid with plan assets.

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

2. Age difference: Males are assumed to be four years older than their spouses.

3. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.

4. Inactive Population: All non-vested members are assumed to take an immediate refund. Members with a vested benefit are assumed to elect a refund or a deferred benefit commencing at age 60, whichever is more valuable at the valuation date.

5. It is assumed there will be no recoveries once disabled.

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

7. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

8. Benefit Service: All active and special contributing members are assumed to accrue one year of eligibility service each year.

Participant Data

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

The data for active members included birth date, gender, service with the current city 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 7.25% net of investment and administrative expenses composed of a 2.25% inflation component and a 5.00% real rate of return, net of investment expenses. This is a prescribed assumption in Section 9-16-335 of the South Carolina State Code.

Rates of Annual Salary Increase

No increases in salary are assumed. 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	20-24	25-29	30+
Age < 60	2.5%	5.0%	100.0%
Age > 59	100.0%	100.0%	2.5%

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		Active Mortality Rates (multiplier added)	
	Males	Females	Males	Females
25	0.1740%	0.1320%	0.0460%	0.0164%
30	0.2320%	0.1760%	0.0429%	0.0207%
35	0.4350%	0.3300%	0.0497%	0.0272%
40	0.5800%	0.4400%	0.0597%	0.0376%
45	0.8700%	0.6600%	0.0924%	0.0624%
50	1.0875%	0.8250%	0.1602%	0.1047%
55	0.0000%	0.0000%	0.2649%	0.1589%
60	0.0000%	0.0000%	0.4454%	0.2320%
64	0.0000%	0.0000%	0.7008%	0.3220%
Multiplier	145%	145%	95%	95%

Post Retirement Mortality

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

Annuitant Mortality Rates Before Projection (Multiplier Applied)		
Age	**SCNG**	
	Males	**Females**
50	0.2548%	0.1638%
55	0.4006%	0.2776%
60	0.7329%	0.4803%
65	1.2748%	0.6671%
70	1.9648%	1.0856%
75	3.3994%	2.0871%
80	6.3116%	4.1978%
85	11.4493%	7.9435%
90	19.8803%	13.9064%
Multiplier	125%	125%

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				
	Year of Retirement			
Gender	**2020**	**2025**	**2030**	**2035**
Male	18.5	18.9	19.3	19.6
Female	21.4	21.6	21.8	22.0

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

3. The normal cost is increased by $10,000 to reflect administrative expenses that are paid with plan assets.

4. There is not a marriage assumption.

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

6. 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		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	6.00%	2.50%	9.44%	7.38%	6.25%	7.00%	4.00%
2	6.00%	2.50%	7.07%	5.00%	3.87%	6.00%	3.00%
3	5.50%	2.00%	4.58%	2.51%	1.39%	5.25%	2.25%
4	5.00%	1.50%	4.23%	2.17%	1.04%	4.75%	1.75%
5	4.75%	1.25%	3.99%	1.92%	0.79%	4.50%	1.50%
6	4.50%	1.00%	3.78%	1.72%	0.59%	4.25%	1.25%
7	4.25%	0.75%	3.84%	1.77%	0.64%	4.00%	1.00%
8	4.00%	0.50%	3.67%	1.61%	0.48%	4.00%	1.00%
9	4.00%	0.50%	3.71%	1.65%	0.52%	4.00%	1.00%
10	3.75%	0.25%	3.40%	1.33%	0.21%	3.75%	0.75%
11	3.75%	0.25%	3.27%	1.21%	0.08%	3.50%	0.50%
12	3.75%	0.25%	3.23%	1.16%	0.04%	3.50%	0.50%
13	3.75%	0.25%	3.25%	1.18%	0.06%	3.50%	0.50%
14	3.75%	0.25%	3.29%	1.23%	0.10%	3.50%	0.50%
15	3.50%	0.00%	3.18%	1.12%	-0.01%	3.50%	0.50%
16	3.50%	0.00%	3.23%	1.16%	0.04%	3.50%	0.50%
17	3.50%	0.00%	3.24%	1.17%	0.05%	3.50%	0.50%
18	3.50%	0.00%	3.19%	1.12%	0.00%	3.50%	0.50%
19	3.50%	0.00%	3.12%	1.05%	-0.07%	3.25%	0.25%
20	3.50%	0.00%	3.10%	1.03%	-0.09%	3.25%	0.25%
21+	3.50%	0.00%	3.19%	1.13%	0.00%	3.00%	0.00%

Current Inflation Assumption	2.75%	Proposed Inflation Assumption	2.25%
Current Productivity Component	0.75%	Proposed Productivity Component	0.75%
Actual CPI-U Inflation for Jun/05 - Jun/15	2.07%	Proposed Wage Inflation	3.00%
Apparent Productivity Component	1.13%		

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL EMPLOYEES
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	7.50%	4.00%	10.87%	8.80%	8.17%	10.00%	7.00%
2	12.50%	9.00%	12.95%	10.88%	10.24%	12.50%	9.50%
3	6.50%	3.00%	6.03%	3.97%	3.33%	6.00%	3.00%
4	6.25%	2.75%	5.08%	3.01%	2.38%	5.75%	2.75%
5	6.00%	2.50%	5.00%	2.93%	2.29%	5.50%	2.50%
6	5.75%	2.25%	4.77%	2.71%	2.07%	5.25%	2.25%
7	5.50%	2.00%	4.77%	2.70%	2.07%	5.00%	2.00%
8	5.25%	1.75%	4.50%	2.44%	1.80%	4.75%	1.75%
9	5.25%	1.75%	4.46%	2.40%	1.76%	4.75%	1.75%
10	5.00%	1.50%	4.27%	2.21%	1.57%	4.50%	1.50%
11	5.00%	1.50%	4.16%	2.09%	1.46%	4.50%	1.50%
12	5.00%	1.50%	3.80%	1.74%	1.10%	4.25%	1.25%
13	4.75%	1.25%	3.68%	1.61%	0.97%	4.00%	1.00%
14	4.50%	1.00%	3.51%	1.44%	0.80%	4.00%	1.00%
15	4.50%	1.00%	3.43%	1.37%	0.73%	3.75%	0.75%
16	4.50%	1.00%	3.31%	1.25%	0.61%	3.75%	0.75%
17	4.25%	0.75%	3.27%	1.20%	0.56%	3.50%	0.50%
18	4.00%	0.50%	3.18%	1.11%	0.47%	3.50%	0.50%
19	3.75%	0.25%	3.09%	1.03%	0.39%	3.25%	0.25%
20	3.75%	0.25%	2.96%	0.90%	0.26%	3.25%	0.25%
21+	3.50%	0.00%	2.70%	0.64%	0.00%	3.00%	0.00%

Current Inflation Assumption	2.75%	Proposed Inflation Assumption	2.25%
Current Productivity Component	0.75%	Proposed Productivity Component	0.75%
Actual CPI-U Inflation for Jun/05 - Jun/15	2.07%	Proposed Wage Inflation	3.00%
Apparent Productivity Component	0.64%		

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	10.00%	6.00%	7.91%	5.85%	4.47%	9.50%	6.00%
2	9.00%	5.00%	10.20%	8.13%	6.76%	9.00%	5.50%
3	6.00%	2.00%	6.06%	3.99%	2.62%	6.50%	3.00%
4	5.00%	1.00%	4.72%	2.66%	1.28%	5.00%	1.50%
5	4.75%	0.75%	4.26%	2.19%	0.81%	4.75%	1.25%
6	4.50%	0.50%	4.21%	2.14%	0.77%	4.50%	1.00%
7	4.25%	0.25%	4.40%	2.33%	0.95%	4.50%	1.00%
8	4.25%	0.25%	4.08%	2.02%	0.64%	4.25%	0.75%
9	4.25%	0.25%	4.10%	2.04%	0.66%	4.25%	0.75%
10	4.25%	0.25%	3.55%	1.49%	0.11%	4.00%	0.50%
11	4.25%	0.25%	3.65%	1.59%	0.21%	4.00%	0.50%
12	4.25%	0.25%	3.74%	1.68%	0.30%	4.00%	0.50%
13	4.00%	0.00%	3.86%	1.79%	0.42%	4.00%	0.50%
14	4.00%	0.00%	3.58%	1.51%	0.13%	3.75%	0.25%
15+	4.00%	0.00%	3.49%	1.42%	0.05%	3.50%	0.00%

Current Inflation Assumption	2.75%
Current Productivity Component	1.25%
Actual CPI-U Inflation for Jun/05 - Jun/15	2.07%
Apparent Productivity Component	1.37%

Proposed Inflation Assumption	2.25%
Proposed Productivity Component	1.25%
Proposed Wage Inflation	3.50%

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)
40-44	$ 2	$ 1,281	0.0015	0.10%	0.15%	$ 2	$ 2	83%	97%
45-49	54	18,496	0.0029	0.14%	0.19%	27	35	199%	154%
50-54	416	116,454	0.0036	0.20%	0.25%	242	295	172%	141%
55-59	1,354	290,789	0.0047	0.36%	0.44%	1,105	1,286	123%	105%
60-64	4,072	539,977	0.0075	0.70%	0.78%	3,966	4,210	103%	97%
65-69	7,833	627,513	0.0125	1.32%	1.28%	8,183	8,003	96%	98%
70-74	9,369	463,558	0.0202	2.17%	2.05%	10,049	9,485	93%	99%
75-79	11,310	315,252	0.0359	3.85%	3.69%	12,147	11,630	93%	97%
80-84	12,942	195,996	0.0660	7.14%	6.72%	13,642	13,176	95%	98%
85-89	11,800	96,853	0.1218	12.43%	11.87%	11,783	11,500	100%	103%
90-94	7,105	36,232	0.1961	20.71%	19.20%	7,101	6,958	100%	102%
95-99	1,474	6,149	0.2397	29.10%	29.74%	1,716	1,829	86%	81%
100-104	171	454	0.3756	37.17%	43.39%	161	197	106%	87%
105-109	36	72	0.5025	40.00%	50.00%	29	36	126%	100%
Total	$ 67,938	$ 2,709,077				$ 70,154	$ 68,641	97%	99%

($ in thousands of benefit)

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
GENERAL 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)
40-44	$ 2	$ 346	0.0069	0.06%	0.10%	$ 0	$ 0	504%	660%
45-49	25	13,759	0.0018	0.09%	0.13%	14	18	183%	138%
50-54	299	131,763	0.0023	0.15%	0.19%	211	251	142%	119%
55-59	1,379	378,529	0.0036	0.29%	0.34%	1,144	1,301	121%	106%
60-64	2,347	566,543	0.0041	0.56%	0.50%	3,236	2,816	73%	83%
65-69	4,064	549,909	0.0074	1.02%	0.74%	5,530	4,090	73%	99%
70-74	4,323	350,738	0.0123	1.70%	1.29%	5,874	4,512	74%	96%
75-79	5,150	207,035	0.0249	2.76%	2.56%	5,637	5,300	91%	97%
80-84	6,454	130,782	0.0493	4.56%	5.05%	5,927	6,604	109%	98%
85-89	7,087	79,542	0.0891	8.16%	9.13%	6,326	7,266	112%	98%
90-94	5,215	30,536	0.1708	13.56%	15.12%	3,986	4,618	131%	113%
95-99	1,943	6,510	0.2984	19.08%	23.54%	1,187	1,533	164%	127%
100-104	314	1,057	0.2967	22.90%	35.88%	237	379	132%	83%
105-109	57	139	0.4135	29.05%	49.13%	38	68	152%	84%
Total	$ 38,658	$ 2,447,188				$ 39,346	$ 38,757	98%	100%

($ in thousands of benefit)

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)
PUBLIC SCHOOL 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)
40-44	$ 0	$ 55	0.0013	0.10%	0.14%	$ 0	$ 0	31%	96%
45-49	9	2,775	0.0032	0.14%	0.18%	5	5	198%	183%
50-54	101	46,260	0.0022	0.20%	0.24%	111	110	91%	92%
55-59	700	148,923	0.0047	0.35%	0.41%	577	607	121%	115%
60-64	1,520	276,326	0.0055	0.64%	0.72%	1,974	1,977	77%	77%
65-69	2,895	281,194	0.0103	1.27%	1.16%	3,605	3,269	80%	89%
70-74	3,257	170,947	0.0191	2.09%	1.88%	3,716	3,207	88%	102%
75-79	3,373	108,443	0.0311	3.83%	3.41%	4,339	3,697	78%	91%
80-84	4,605	72,534	0.0635	7.31%	6.19%	5,306	4,488	87%	103%
85-89	3,898	35,063	0.1112	13.09%	10.85%	4,511	3,805	86%	102%
90-94	2,598	13,284	0.1956	22.30%	17.85%	2,836	2,371	92%	110%
95-99	834	2,229	0.3740	32.01%	27.47%	686	612	122%	136%
100-104	99	231	0.4291	40.89%	39.85%	90	92	110%	108%
105-109	8	33	0.2500	44.00%	46.00%	14	15	57%	54%
Total	$ 23,898	$ 1,158,295				$ 27,770	$ 24,256	86%	99%

($ in thousands of benefit)

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)
40-44	$ 0	$ 50	0.0000	0.06%	0.10%	$ 0	$ 0	0%	0%
45-49	1	6,410	0.0002	0.09%	0.12%	6	8	23%	20%
50-54	229	224,183	0.0010	0.15%	0.17%	367	383	62%	60%
55-59	1,823	671,955	0.0027	0.29%	0.30%	2,033	2,041	90%	89%
60-64	4,018	1,050,241	0.0038	0.53%	0.44%	5,693	4,606	71%	87%
65-69	5,205	862,229	0.0060	0.96%	0.65%	8,161	5,618	64%	93%
70-74	5,519	477,122	0.0116	1.63%	1.13%	7,641	5,395	72%	102%
75-79	6,362	300,257	0.0212	2.70%	2.28%	8,046	6,858	79%	93%
80-84	10,343	232,177	0.0445	4.56%	4.50%	10,606	10,445	98%	99%
85-89	11,822	146,338	0.0808	8.27%	8.08%	11,806	11,823	100%	100%
90-94	9,729	65,802	0.1479	13.71%	13.46%	8,752	8,858	111%	110%
95-99	4,649	18,065	0.2574	20.14%	21.08%	3,462	3,809	134%	122%
100-104	1,211	3,466	0.3494	24.18%	31.11%	814	1,078	149%	112%
105-109	98	208	0.4733	30.66%	42.50%	59	88	165%	111%
Total	$ 61,010	$ 4,058,503				$ 67,447	$ 61,010	90%	100%

($ in thousands of benefit)

SOUTH CAROLINA 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)
40-44	$ 5	$ 6,920	0.0007	0.31%	0.19%	$ 21	$ 13	24%	38%
45-49	83	63,179	0.0013	0.20%	0.23%	125	147	66%	56%
50-54	445	126,561	0.0035	0.28%	0.31%	349	388	127%	115%
55-59	827	176,122	0.0047	0.54%	0.54%	957	959	86%	86%
60-64	2,128	204,704	0.0104	1.06%	0.95%	2,161	1,944	98%	109%
65-69	2,392	165,530	0.0145	1.87%	1.58%	3,093	2,613	77%	92%
70-74	3,033	96,685	0.0314	3.06%	2.55%	2,954	2,464	103%	123%
75-79	2,901	62,816	0.0462	5.12%	4.57%	3,214	2,873	90%	101%
80-84	3,210	33,203	0.0967	8.72%	8.33%	2,896	2,765	111%	116%
85-89	1,974	13,607	0.1451	14.28%	14.57%	1,943	1,983	102%	100%
90-94	697	3,731	0.1867	22.04%	23.91%	822	892	85%	78%
95-99	138	328	0.4225	31.46%	36.22%	103	119	134%	117%
100-104	-	-	N/A	0.00%	59.10%	-	-	0%	0%
105-109	-	12	0.0000	0.00%	62.50%	5	-	0%	0%
Other	3	393	0.0073	0.00%	0.00%	-	-	0%	0%
Total	$ 17,836	$ 953,789				$ 18,646	$ 17,161	96%	104%

($ in thousands of benefit)

SOUTH CAROLINA POLICE OFFICERS RETIREMENT SYSTEM (PORS)
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)
40-44	$ 4	$ 606	0.0059	0.10%	0.12%	$ 1	$ 1	303%	451%
45-49	47	7,337	0.0065	0.14%	0.18%	11	14	435%	344%
50-54	66	22,057	0.0030	0.21%	0.25%	48	56	138%	118%
55-59	166	37,174	0.0045	0.36%	0.38%	137	144	121%	115%
60-64	238	39,075	0.0061	0.72%	0.75%	287	299	83%	80%
65-69	332	28,194	0.0118	1.41%	1.47%	391	407	85%	82%
70-74	254	14,939	0.0170	2.42%	2.56%	350	371	73%	69%
75-79	132	6,906	0.0191	3.82%	4.10%	256	277	51%	48%
80-84	115	1,816	0.0635	6.23%	6.69%	109	117	106%	99%
85-89	136	871	0.1562	11.09%	11.37%	97	100	141%	137%
90-94	63	433	0.1447	17.64%	17.81%	74	74	85%	84%
95-99	21	56	0.3802	24.38%	23.89%	13	13	163%	165%
100-104	8	8	1.0000	29.27%	28.25%	2	2	372%	379%
105-109	-	-	N/A	37.11%	35.82%	-	-	0%	0%
Other	18	143	0.1248	0.00%	0.00%	-	-	0%	0%
Total	$ 1,601	$ 159,615				$ 1,777	$ 1,874	90%	85%

($ in thousands of benefit)

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	22	1,455	0.0151	1.89%	1.88%	28	27	80%	81%
55-59	22	1,397	0.0157	2.28%	2.12%	32	30	69%	74%
60-64	30	1,107	0.0271	2.70%	2.44%	30	27	101%	111%
65-69	21	657	0.0320	3.27%	2.98%	21	19	99%	108%
70-74	16	294	0.0544	4.16%	3.90%	12	11	133%	142%
75-79	12	150	0.0800	5.53%	5.33%	8	8	146%	152%
80-84	5	67	0.0746	7.31%	7.64%	5	5	104%	100%
85-89	2	27	0.0741	9.31%	11.45%	2	3	82%	68%
90-94	0	0	N/A	13.00%	17.23%	0	0	0%	0%
95-99	0	0	N/A	17.99%	23.70%	0	0	0%	0%
Total	130	5,154				138	131	94%	100%

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	8	598	0.0134	0.81%	1.12%	5	7	164%	119%
55-59	5	593	0.0084	1.12%	1.32%	7	8	76%	64%
60-64	10	329	0.0304	1.44%	1.56%	5	5	212%	196%
65-69	4	182	0.0220	1.88%	1.99%	3	4	118%	112%
70-74	2	41	0.0488	2.57%	2.79%	1	1	199%	184%
75-79	0	9	0.0000	3.57%	4.12%	0	0	0%	0%
80-84	0	4	0.0000	4.94%	6.12%	0	0	0%	0%
85-89	0	1	0.0000	6.87%	9.00%	0	0	0%	0%
90-94	0	0	N/A	9.60%	13.23%	0	0	0%	0%
95-99	0	0	N/A	12.91%	19.31%	0	0	0%	0%
Total	29	2,642				21	25	137%	116%

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	20	439	0.0456	2.37%	2.71%	10	12	191%	167%
55-59	27	796	0.0339	2.85%	3.08%	23	25	118%	109%
60-64	42	1,233	0.0341	3.37%	3.57%	42	44	101%	95%
65-69	35	957	0.0366	4.08%	4.39%	39	42	90%	84%
70-74	28	584	0.0479	5.21%	5.73%	30	33	93%	85%
75-79	25	254	0.0984	6.91%	7.86%	17	20	145%	127%
80-84	17	118	0.1441	9.14%	11.31%	11	13	160%	129%
85-89	11	76	0.1447	11.64%	16.97%	9	13	125%	86%
90-94	6	24	0.2500	16.25%	25.49%	4	6	161%	102%
95-99	1	1	1.0000	22.49%	34.92%	0	0	498%	322%
100-104	0	0	N/A	27.88%	45.13%	0	0	0%	0%
105-109	0	0	N/A	30.00%	56.03%	0	0	0%	0%
Total	212	4,482				185	208	115%	102%

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	45	1,988	0.0226	1.48%	1.63%	30	33	150%	138%
55-59	73	3,503	0.0208	2.05%	1.94%	73	69	100%	106%
60-64	126	5,037	0.0250	2.65%	2.31%	134	117	94%	107%
65-69	99	4,072	0.0243	3.45%	2.94%	139	119	71%	83%
70-74	77	2,168	0.0355	4.71%	4.12%	101	88	76%	87%
75-79	74	1,240	0.0597	6.55%	6.08%	80	75	92%	99%
80-84	62	652	0.0951	9.05%	9.05%	58	58	106%	107%
85-89	47	332	0.1416	12.60%	13.35%	41	43	114%	108%
90-94	34	143	0.2378	17.59%	19.57%	25	27	138%	125%
95-99	12	36	0.3333	23.68%	28.48%	8	10	146%	122%
100-104	1	1	1.0000	27.99%	39.43%	0	0	383%	287%
105-109	0	0	N/A	35.50%	51.36%	0	0	0%	0%
Total	650	19,172				690	639	94%	102%

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	22	1,455	0.0151	1.89%	1.88%	28	27	80%	81%
55-59	22	1,397	0.0157	2.28%	2.12%	32	30	69%	74%
60-64	30	1,107	0.0271	2.70%	2.44%	30	27	101%	111%
65-69	21	657	0.0320	3.27%	2.98%	21	19	99%	108%
70-74	16	294	0.0544	4.16%	3.90%	12	11	133%	142%
75-79	12	150	0.0800	5.53%	5.33%	8	8	146%	152%
80-84	5	67	0.0746	7.31%	7.64%	5	5	104%	100%
85-89	2	27	0.0741	9.31%	11.45%	2	3	82%	68%
90-94	0	0	N/A	13.00%	17.23%	0	0	0%	0%
95-99	0	0	N/A	17.99%	23.70%	0	0	0%	0%
Total	130	5,154				138	131	94%	100%

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	8	598	0.0134	0.81%	1.12%	5	7	164%	119%
55-59	5	593	0.0084	1.12%	1.32%	7	8	76%	64%
60-64	10	329	0.0304	1.44%	1.56%	5	5	212%	196%
65-69	4	182	0.0220	1.88%	1.99%	3	4	118%	112%
70-74	2	41	0.0488	2.57%	2.79%	1	1	199%	184%
75-79	0	9	0.0000	3.57%	4.12%	0	0	0%	0%
80-84	0	4	0.0000	4.94%	6.12%	0	0	0%	0%
85-89	0	1	0.0000	6.87%	9.00%	0	0	0%	0%
90-94	0	0	N/A	9.60%	13.23%	0	0	0%	0%
95-99	0	0	N/A	12.91%	19.31%	0	0	0%	0%
Total	29	2,642				21	25	137%	116%

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	233	0.0000	0.03%	0.03%	0	0	0%	0%
20-24	5	6,836	0.0007	0.04%	0.05%	3	3	182%	167%
25-29	14	16,133	0.0009	0.04%	0.04%	7	7	207%	200%
30-34	20	19,163	0.0010	0.06%	0.05%	12	9	169%	222%
35-39	17	20,855	0.0008	0.10%	0.05%	21	11	82%	155%
40-44	29	26,558	0.0011	0.13%	0.07%	35	19	82%	153%
45-49	50	28,285	0.0018	0.19%	0.12%	54	33	93%	152%
50-54	80	30,001	0.0027	0.27%	0.20%	81	59	99%	136%
55-59	100	27,340	0.0037	0.40%	0.32%	109	89	92%	112%
60-64	109	19,837	0.0055	0.65%	0.56%	129	109	84%	100%
65-69	50	7,523	0.0066	0.95%	0.97%	71	70	70%	71%
70-74	35	2,337	0.0150	3.00%	1.62%	70	37	50%	95%
Total	509	205,101				592	446	86%	114%

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	239	0.0000	0.01%	0.01%	0	0	0%	0%
20-24	1	8,010	0.0001	0.02%	0.02%	1	1	80%	100%
25-29	9	26,021	0.0003	0.02%	0.02%	5	5	194%	180%
30-34	11	33,061	0.0003	0.03%	0.02%	9	8	119%	138%
35-39	20	34,593	0.0006	0.04%	0.03%	15	11	130%	182%
40-44	28	40,473	0.0007	0.07%	0.05%	28	19	101%	147%
45-49	47	45,491	0.0010	0.11%	0.08%	48	36	97%	131%
50-54	63	47,378	0.0013	0.16%	0.12%	75	59	85%	107%
55-59	79	42,987	0.0018	0.24%	0.18%	104	79	76%	100%
60-64	90	27,689	0.0033	0.37%	0.27%	103	74	87%	122%
65-69	22	7,997	0.0028	0.53%	0.43%	42	33	52%	67%
70-74	10	1,486	0.0067	1.65%	0.74%	25	10	41%	100%
Total	380	315,425				454	335	84%	113%

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	59	0.0000	0.03%	0.03%	0	0	0%	0%
20-24	0	1,298	0.0000	0.04%	0.05%	1	1	0%	0%
25-29	3	6,965	0.0004	0.04%	0.04%	3	3	101%	100%
30-34	5	8,800	0.0006	0.06%	0.05%	4	4	125%	125%
35-39	9	9,601	0.0009	0.10%	0.05%	5	5	179%	180%
40-44	7	10,846	0.0006	0.14%	0.07%	7	8	94%	88%
45-49	18	10,637	0.0017	0.20%	0.12%	12	12	147%	150%
50-54	23	11,052	0.0021	0.28%	0.20%	22	22	106%	105%
55-59	34	9,480	0.0036	0.42%	0.32%	31	31	111%	110%
60-64	41	7,093	0.0058	0.68%	0.56%	40	39	104%	105%
65-69	21	2,607	0.0081	0.99%	0.97%	25	24	83%	88%
70-74	10	736	0.0136	3.14%	1.62%	12	11	84%	91%
Total	171	79,174				161	160	106%	107%

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	127	0.0000	0.01%	0.01%	0	0	0%	0%
20-24	0	3,896	0.0000	0.01%	0.02%	1	1	0%	0%
25-29	2	25,848	0.0001	0.02%	0.02%	4	6	50%	33%
30-34	11	32,217	0.0003	0.02%	0.02%	8	8	139%	138%
35-39	19	38,578	0.0005	0.04%	0.03%	15	11	127%	173%
40-44	26	48,762	0.0005	0.06%	0.04%	29	18	89%	144%
45-49	32	49,990	0.0006	0.09%	0.06%	46	31	69%	103%
50-54	50	51,445	0.0010	0.14%	0.10%	71	53	71%	94%
55-59	80	43,221	0.0019	0.21%	0.17%	91	74	88%	108%
60-64	65	26,570	0.0024	0.33%	0.29%	87	76	75%	86%
65-69	28	7,001	0.0040	0.46%	0.51%	32	34	87%	82%
70-74	9	1,226	0.0073	1.45%	0.85%	18	10	51%	90%
Total	322	328,881				401	322	80%	100%

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)
							0		
Under 20	0	81	0.0000	0.03%	0.03%	0	0	0%	0%
20-24	6	6,052	0.0010	0.03%	0.05%	2	3	301%	200%
25-29	9	15,783	0.0006	0.03%	0.04%	5	7	166%	129%
30-34	9	15,803	0.0006	0.08%	0.05%	12	7	72%	129%
35-39	12	15,335	0.0008	0.11%	0.05%	17	8	72%	150%
40-44	15	16,515	0.0009	0.14%	0.07%	22	12	67%	125%
45-49	22	12,370	0.0018	0.18%	0.12%	22	14	99%	157%
50-54	22	8,367	0.0026	0.27%	0.20%	23	16	98%	138%
55-59	22	5,195	0.0042	0.51%	0.32%	26	17	84%	129%
60-64	15	2,902	0.0052	0.97%	0.56%	28	16	53%	94%
65-69	9	690	0.0130	1.76%	0.97%	12	6	74%	150%
70-74	2	39	0.0513	2.90%	1.62%	1	1	177%	200%
Total	143	99,132				172	107	83%	134%

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	5	0.0000	0.02%	0.01%	0	0	0%	0%
20-24	1	1,354	0.0007	0.02%	0.02%	0	0	423%	0%
25-29	1	4,427	0.0002	0.02%	0.02%	1	1	113%	100%
30-34	3	4,598	0.0007	0.03%	0.02%	2	1	198%	300%
35-39	0	4,576	0.0000	0.06%	0.03%	3	1	0%	0%
40-44	5	5,024	0.0010	0.10%	0.05%	5	2	103%	250%
45-49	6	4,704	0.0013	0.14%	0.08%	7	4	89%	150%
50-54	3	4,014	0.0007	0.20%	0.12%	8	5	37%	60%
55-59	9	2,640	0.0034	0.31%	0.18%	8	5	112%	180%
60-64	7	1,166	0.0060	0.61%	0.27%	7	3	98%	233%
65-69	1	213	0.0047	1.19%	0.43%	3	1	39%	100%
70-74	0	5	0.0000	2.08%	0.74%	0	0	0%	0%
Total	36	32,726				43	23	84%	157%

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	2	0.0000	0.05%	0.05%	0	0	0%	0%
20-24	0	556	0.0000	0.05%	0.05%	0	0	0%	0%
25-29	7	6,834	0.0010	0.07%	0.07%	5	5	145%	145%
30-34	10	13,716	0.0007	0.12%	0.12%	17	17	60%	60%
35-39	25	17,043	0.0015	0.19%	0.19%	33	33	77%	77%
40-44	57	22,710	0.0025	0.29%	0.29%	66	66	86%	86%
45-49	109	24,429	0.0045	0.41%	0.41%	101	101	108%	108%
50-54	173	26,523	0.0065	0.62%	0.62%	166	166	104%	104%
55-59	240	24,289	0.0099	0.89%	0.89%	215	215	111%	111%
60-64	227	18,231	0.0125	1.13%	1.13%	207	207	110%	110%
Total	848	154,333				810	810	105%	105%

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	2	0.0000	0.05%	0.05%	0	0	0%	0%
20-24	0	658	0.0000	0.05%	0.05%	0	0	0%	0%
25-29	3	9,341	0.0003	0.05%	0.05%	5	5	60%	60%
30-34	14	22,249	0.0006	0.09%	0.09%	20	20	69%	69%
35-39	33	26,138	0.0013	0.15%	0.15%	38	38	87%	87%
40-44	75	32,192	0.0023	0.20%	0.20%	63	63	118%	118%
45-49	151	37,710	0.0040	0.31%	0.31%	116	116	130%	130%
50-54	230	40,236	0.0057	0.51%	0.51%	204	204	113%	113%
55-59	312	37,376	0.0083	0.79%	0.79%	295	295	106%	106%
60-64	243	25,062	0.0097	1.19%	1.19%	298	298	81%	81%
Total	1,061	230,964				1,040	1,040	102%	102%

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	1	0.0000	0.04%	0.04%	0	0	0%	0%
20-24	0	100	0.0000	0.04%	0.04%	0	0	0%	0%
25-29	1	2,650	0.0004	0.05%	0.05%	1	1	75%	75%
30-34	2	7,256	0.0003	0.07%	0.07%	5	5	39%	39%
35-39	6	8,642	0.0007	0.11%	0.11%	10	10	61%	61%
40-44	22	9,392	0.0023	0.20%	0.20%	19	19	118%	118%
45-49	38	9,045	0.0042	0.32%	0.32%	29	29	129%	129%
50-54	47	9,391	0.0050	0.52%	0.52%	49	49	96%	96%
55-59	77	7,886	0.0098	0.83%	0.83%	65	65	118%	118%
60-64	82	6,011	0.0136	1.18%	1.18%	71	71	116%	116%
Total	275	60,374				250	250	110%	110%

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%	0.03%	0	0	0%	0%
20-24	0	386	0.0000	0.03%	0.03%	0	0	0%	0%
25-29	0	12,244	0.0000	0.05%	0.05%	6	6	0%	0%
30-34	10	27,762	0.0004	0.06%	0.06%	17	17	58%	58%
35-39	30	33,762	0.0009	0.08%	0.08%	26	26	115%	115%
40-44	77	42,495	0.0018	0.15%	0.15%	65	65	119%	119%
45-49	127	44,775	0.0028	0.27%	0.27%	122	122	104%	104%
50-54	240	47,294	0.0051	0.44%	0.44%	208	208	115%	115%
55-59	318	39,839	0.0080	0.70%	0.70%	277	277	115%	115%
60-64	263	24,953	0.0105	0.99%	0.99%	247	247	106%	106%
Total	1,065	273,510				968	968	110%	110%

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	86	0.0000	0.11%	0.15%	0	0	0%	0%
20-24	0	7,406	0.0000	0.13%	0.16%	9	12	0%	0%
25-29	11	20,210	0.0005	0.16%	0.20%	32	40	34%	28%
30-34	46	20,401	0.0023	0.25%	0.32%	51	64	89%	72%
35-39	113	19,911	0.0057	0.39%	0.49%	78	98	146%	115%
40-44	147	21,539	0.0068	0.55%	0.70%	119	149	124%	99%
45-49	171	17,074	0.0100	0.76%	0.96%	129	163	132%	105%
50-54	164	12,381	0.0132	1.09%	1.38%	135	170	122%	96%
Total	652	119,008				554	696	118%	94%

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	$ 77,074	$ 384,614	0.2004	25.69%	20.04%	$ 98,793	$ 77,074	78%	100%
1	151,884	869,544	0.1747	18.50%	17.47%	160,883	151,884	94%	100%
2	92,634	754,393	0.1228	13.63%	12.28%	102,788	92,634	90%	100%
3	71,032	690,190	0.1029	10.60%	10.29%	73,167	71,032	97%	100%
4	56,533	630,662	0.0896	8.88%	8.96%	56,031	56,533	101%	100%
5	41,736	491,995	0.0848	8.20%	8.48%	40,357	41,736	103%	100%
6	32,156	452,736	0.0710	7.39%	7.10%	33,449	32,156	96%	100%
7	25,738	402,556	0.0639	6.59%	6.39%	26,530	25,738	97%	100%
8	17,476	350,649	0.0498	5.61%	5.50%	19,671	19,286	89%	91%
9	16,202	305,085	0.0531	4.26%	5.00%	12,983	15,254	125%	106%
10	10,510	273,364	0.0384	2.42%	0.00%	6,625	0	159%	0%
Total	$ 592,976	$ 5,605,788				$ 631,278	$ 583,328	94%	102%

($ in thousands of salary)

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	$ 129,630	$ 564,526	0.2296	24.72%	22.96%	$ 139,556	$ 129,630	93%	100%
1	277,834	1,277,769	0.2174	19.20%	21.74%	245,297	277,834	113%	100%
2	152,975	1,081,673	0.1414	14.89%	14.14%	161,098	152,975	95%	100%
3	115,514	976,504	0.1183	11.98%	11.83%	117,012	115,514	99%	100%
4	90,192	889,494	0.1014	10.08%	10.14%	89,630	90,192	101%	100%
5	78,882	813,669	0.0969	8.15%	9.67%	66,310	78,674	119%	100%
6	65,107	771,710	0.0844	6.92%	8.41%	53,440	64,897	122%	100%
7	53,512	713,165	0.0750	5.76%	7.48%	41,091	53,355	130%	100%
8	43,785	657,711	0.0666	4.53%	6.64%	29,806	43,652	147%	100%
9	35,033	610,047	0.0574	3.20%	5.73%	19,498	34,946	180%	100%
10	28,981	577,453	0.0502	1.77%	0.00%	10,193	0	284%	0%
Total	$ 1,071,447	$ 8,933,720				$ 972,932	$ 1,041,670	110%	103%

($ in thousands of salary)

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

				Assumed Rate		Expected Terminations		Actual/Expected	
Year(s) From Retirement	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	$ 987	$ 89,656	0.0110	1.44%	0.60%	$ 1,290	$ 538	77%	183%
2	1,255	154,158	0.0081	1.56%	0.70%	2,411	1,079	52%	116%
3	1,095	168,253	0.0065	1.70%	0.80%	2,860	1,346	38%	81%
4	1,895	223,852	0.0085	1.85%	0.90%	4,133	2,015	46%	94%
5	2,351	267,712	0.0088	2.00%	1.00%	5,363	2,677	44%	88%
6	3,239	277,575	0.0117	2.17%	1.10%	6,026	3,053	54%	106%
7	3,997	279,435	0.0143	2.35%	1.30%	6,564	3,633	61%	110%
8	3,508	279,011	0.0126	2.54%	1.50%	7,082	4,185	50%	84%
9	5,911	282,915	0.0209	2.74%	1.80%	7,746	5,092	76%	116%
10	6,055	287,872	0.0210	2.95%	2.00%	8,488	5,757	71%	105%
11	8,650	304,688	0.0284	3.17%	2.30%	9,658	7,008	90%	123%
12	6,967	321,780	0.0217	3.40%	2.60%	10,946	8,366	64%	83%
13	8,963	337,350	0.0266	3.64%	2.90%	12,294	9,783	73%	92%
14	11,511	354,154	0.0325	3.90%	3.10%	13,803	10,979	83%	105%
15	13,043	371,958	0.0351	4.16%	3.40%	15,479	12,647	84%	103%
16	14,842	392,080	0.0379	4.44%	3.70%	17,393	14,507	85%	102%
17	14,430	393,297	0.0367	4.72%	4.00%	18,569	15,732	78%	92%
Total	$ 108,700	$ 4,785,746				$ 150,105	$ 108,397	72%	100%

($ in thousands of salary)

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

				Assumed Rate		Expected Terminations		Actual/Expected	
Year(s) From Retirement	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	$ 1,185	$ 110,702	0.0107	1.49%	0.80%	$ 1,651	$ 886	72%	134%
2	1,518	176,822	0.0086	1.59%	0.90%	2,806	1,591	54%	95%
3	2,067	194,719	0.0106	1.70%	1.00%	3,312	1,947	62%	106%
4	2,708	269,697	0.0100	1.83%	1.10%	4,946	2,967	55%	91%
5	3,612	317,972	0.0114	1.98%	1.20%	6,312	3,816	57%	95%
6	4,566	336,685	0.0136	2.15%	1.30%	7,254	4,377	63%	104%
7	4,805	352,720	0.0136	2.34%	1.40%	8,264	4,938	58%	97%
8	5,324	365,252	0.0146	2.55%	1.60%	9,313	5,844	57%	91%
9	7,667	374,112	0.0205	2.78%	1.80%	10,382	6,734	74%	114%
10	9,450	385,636	0.0245	3.02%	2.00%	11,642	7,713	81%	123%
11	11,141	414,006	0.0269	3.28%	2.30%	13,584	9,522	82%	117%
12	11,853	439,986	0.0269	3.56%	2.60%	15,672	11,440	76%	104%
13	13,055	466,528	0.0280	3.86%	3.00%	18,015	13,996	72%	93%
14	17,838	497,472	0.0359	4.18%	3.40%	20,791	16,914	86%	105%
15	19,581	527,701	0.0371	4.52%	3.80%	23,830	20,053	82%	98%
16	22,149	545,081	0.0406	4.87%	4.20%	26,549	22,893	83%	97%
17	27,305	558,655	0.0489	5.24%	4.60%	29,297	25,698	93%	106%
Total	$ 165,825	$ 6,333,746				$ 213,620	$ 161,329	78%	103%

($ in thousands of salary)

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)
1	$ 18,334	$ 84,321	0.2174	24.32%	21.74%	$ 20,506	$ 18,334	89%	100%
2	53,878	371,077	0.1452	17.73%	14.52%	65,786	53,878	82%	100%
3	42,833	366,839	0.1168	12.72%	11.68%	46,671	42,833	92%	100%
4	32,523	331,830	0.0980	9.53%	9.80%	31,611	32,523	103%	100%
5	24,439	296,034	0.0826	7.65%	8.26%	22,657	24,439	108%	100%
6	18,922	266,702	0.0709	6.20%	7.08%	16,541	18,877	114%	100%
7	15,953	263,057	0.0606	5.56%	6.06%	14,627	15,933	109%	100%
8	12,998	259,134	0.0502	4.84%	5.01%	12,541	12,971	104%	100%
9	10,311	247,984	0.0416	3.94%	4.15%	9,774	10,290	105%	100%
10	9,338	239,969	0.0389	2.77%	3.89%	6,644	9,328	141%	100%
Total	$ 239,530	$ 2,726,947				$ 247,358	$ 239,407	97%	100%

($ in thousands of salary)

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

Service	Actual	Total Exposures	Actual Rate	Assumed Rate		Expected Terminations		Actual/Expected	
				Current	Proposed	Current	Proposed	Current	Proposed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	$ 38,619	$ 190,988	0.2022	21.01%	20.22%	$ 40,126	$ 38,619	96%	100%
2	134,975	1,076,328	0.1254	15.21%	12.54%	163,715	134,975	82%	100%
3	114,893	1,115,422	0.1030	11.33%	10.30%	126,396	114,893	91%	100%
4	93,249	1,046,901	0.0891	8.95%	8.91%	93,724	93,249	99%	100%
5	72,361	981,709	0.0737	7.59%	7.37%	74,488	72,361	97%	100%
6	65,496	950,076	0.0689	6.13%	6.88%	58,196	65,359	113%	100%
7	54,705	968,209	0.0565	5.35%	5.64%	51,847	54,619	106%	100%
8	50,634	964,150	0.0525	4.60%	5.24%	44,393	50,551	114%	100%
9	43,303	940,345	0.0461	3.78%	4.60%	35,519	43,259	122%	100%
10	34,038	918,890	0.0370	2.73%	3.70%	25,057	33,997	136%	100%
Total	$ 702,273	$ 9,153,018				$ 713,462	$ 701,880	98%	100%

($ in thousands of salary)

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

				Assumed Rate		Expected Terminations		Actual/Expected	
Year(s) From Retirement	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	$ 600	$ 36,852	0.0163	0.89%	0.80%	$ 326	$ 295	184%	203%
2	718	81,279	0.0088	1.16%	0.90%	942	732	76%	98%
3	795	87,522	0.0091	1.36%	1.00%	1,188	875	67%	91%
4	963	99,217	0.0097	1.52%	1.10%	1,506	1,091	64%	88%
5	1,506	115,415	0.0130	1.66%	1.20%	1,911	1,385	79%	109%
6	1,596	124,889	0.0128	1.78%	1.30%	2,220	1,624	72%	98%
7	2,330	131,235	0.0178	1.89%	1.40%	2,477	1,837	94%	127%
8	2,112	137,423	0.0154	1.99%	1.50%	2,732	2,061	77%	102%
9	2,082	142,946	0.0146	2.08%	1.70%	2,975	2,430	70%	86%
10	2,283	154,722	0.0148	2.17%	2.00%	3,355	3,094	68%	74%
11	3,587	166,206	0.0216	2.25%	2.20%	3,740	3,657	96%	98%
12	4,481	178,709	0.0251	2.33%	2.40%	4,160	4,289	108%	104%
13	4,973	193,387	0.0257	2.40%	2.60%	4,644	5,028	107%	99%
14	5,029	204,550	0.0246	2.47%	2.70%	5,056	5,523	99%	91%
15	6,295	215,282	0.0292	2.54%	2.80%	5,466	6,028	115%	104%
16	7,003	223,808	0.0313	2.60%	2.90%	5,827	6,490	120%	108%
17	6,659	227,581	0.0293	2.67%	3.00%	6,067	6,827	110%	98%
Total	$ 53,011	$ 2,521,024				$ 54,592	$ 53,266	97%	100%

($ in thousands of salary)

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

				Assumed Rate		Expected Terminations		Actual/Expected	
Year(s) From Retirement	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	$ 1,580	$ 184,017	0.0086	0.79%	0.60%	$ 1,450	$ 1,104	109%	143%
2	1,958	362,973	0.0054	0.90%	0.60%	3,249	2,178	60%	90%
3	2,373	380,253	0.0062	1.01%	0.60%	3,832	2,282	62%	104%
4	3,024	459,256	0.0066	1.13%	0.70%	5,173	3,215	58%	94%
5	3,609	536,605	0.0067	1.25%	0.80%	6,710	4,293	54%	84%
6	4,956	554,463	0.0089	1.38%	0.90%	7,653	4,990	65%	99%
7	5,713	581,268	0.0098	1.52%	1.00%	8,811	5,813	65%	98%
8	7,696	598,167	0.0129	1.66%	1.10%	9,911	6,580	78%	117%
9	7,819	621,684	0.0126	1.80%	1.20%	11,213	7,460	70%	105%
10	8,929	664,715	0.0134	1.96%	1.40%	13,002	9,306	69%	96%
11	10,679	705,355	0.0151	2.11%	1.60%	14,912	11,286	72%	95%
12	13,886	749,784	0.0185	2.28%	1.80%	17,079	13,496	81%	103%
13	15,308	790,383	0.0194	2.45%	2.00%	19,343	15,808	79%	97%
14	18,585	824,056	0.0226	2.62%	2.20%	21,610	18,129	86%	103%
15	19,103	854,509	0.0224	2.80%	2.40%	23,952	20,508	80%	93%
16	22,339	871,469	0.0256	2.99%	2.70%	26,052	23,530	86%	95%
17	27,238	881,738	0.0309	3.18%	3.00%	28,052	26,452	97%	103%
Total	$ 174,796	$ 10,620,694				$ 222,004	$ 176,430	79%	99%

($ in thousands of salary)

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)
0	$ 101,306	$ 384,047	0.2638	25.00%	25.00%	$ 96,012	$ 96,012	106%	106%
1	144,861	748,222	0.1936	18.00%	18.00%	134,680	134,680	108%	108%
2	91,589	658,565	0.1391	14.00%	14.00%	92,199	92,199	99%	99%
3	68,078	597,160	0.1140	12.00%	12.00%	71,659	71,659	95%	95%
4	53,874	533,525	0.1010	10.70%	10.70%	57,087	57,087	94%	94%
5	42,979	472,387	0.0910	9.54%	9.54%	45,066	45,066	95%	95%
6	36,033	436,569	0.0825	8.50%	8.50%	37,108	37,108	97%	97%
7	30,220	409,165	0.0739	7.58%	7.58%	31,015	31,015	97%	97%
8	27,153	378,366	0.0718	6.75%	6.75%	25,540	25,540	106%	106%
9	19,726	354,406	0.0557	6.02%	6.02%	21,335	21,335	92%	92%
10	18,643	338,813	0.0550	5.37%	5.37%	18,194	18,194	102%	102%
11	15,359	327,250	0.0469	4.78%	4.78%	15,643	15,643	98%	98%
12	14,147	311,571	0.0454	4.26%	4.26%	13,273	13,273	107%	107%
13	11,402	294,959	0.0387	3.80%	3.80%	11,208	11,208	102%	102%
14	9,452	280,251	0.0337	3.39%	3.39%	9,500	9,500	99%	99%
15	9,859	267,373	0.0369	3.02%	3.02%	8,075	8,075	122%	122%
16	6,314	257,662	0.0245	2.69%	2.69%	6,931	6,931	91%	91%
17	6,047	244,581	0.0247	2.40%	2.40%	5,870	5,870	103%	103%
18	5,349	231,139	0.0231	2.14%	2.14%	4,946	4,946	108%	108%
19	5,385	225,700	0.0239	1.91%	1.91%	4,311	4,311	125%	125%
20	3,368	212,959	0.0158	1.70%	1.70%	3,620	3,620	93%	93%
21	3,386	197,356	0.0172	1.51%	1.51%	2,980	2,980	114%	114%
22	3,110	182,487	0.0170	1.35%	1.35%	2,464	2,464	126%	126%
23	1,951	164,251	0.0119	1.20%	1.20%	1,971	1,971	99%	99%
Total	$ 729,594	$ 8,508,764				$ 720,688	$ 720,688	101%	101%

($ are in thousands of salary)

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	$ 57,253	$ 186,588	0.3068	50.00%	50.00%	$ 93,294	$ 93,294	61%	61%
66	$ 23,353	$ 77,926	0.2997	20.00%	20.00%	$ 15,585	$ 15,585	150%	150%
67	18,540	65,998	0.2809	20.00%	20.00%	13,200	13,200	140%	140%
68	7,442	41,714	0.1784	17.00%	17.00%	7,091	7,091	105%	105%
69	7,580	29,001	0.2614	17.00%	17.00%	4,930	4,930	154%	154%
70	5,803	23,141	0.2508	17.00%	17.00%	3,934	3,934	148%	148%
71	3,029	17,571	0.1724	17.00%	17.00%	2,987	2,987	101%	101%
72	3,473	15,253	0.2277	17.00%	17.00%	2,593	2,593	134%	134%
73	2,449	10,147	0.2414	17.00%	17.00%	1,725	1,725	142%	142%
74	1,262	6,879	0.1834	17.00%	17.00%	1,145	1,145	110%	110%
Subtotal	$ 72,932	$ 287,629				$ 53,190	$ 53,190	137%	137%
75 or more	2,817	17,800	0.1582	100.00%	100.00%	16,774	16,774	17%	17%
Total	$ 133,001	$ 492,017				$ 163,258	$ 163,258	81%	81%

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

($ in thousands of liability)

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	$ 77,480	$ 207,799	0.3729	50.00%	50.00%	$ 103,899	$ 103,899	75%	75%
66	$ 30,271	$ 84,743	0.3572	25.00%	25.00%	$ 21,186	$ 21,186	143%	143%
67	17,251	58,338	0.2957	25.00%	25.00%	14,585	14,585	118%	118%
68	9,729	33,497	0.2905	20.00%	20.00%	6,699	6,699	145%	145%
69	6,504	25,051	0.2596	20.00%	20.00%	5,010	5,010	130%	130%
70	3,872	21,147	0.1831	20.00%	20.00%	4,229	4,229	92%	92%
71	4,050	14,329	0.2826	20.00%	20.00%	2,866	2,866	141%	141%
72	1,771	9,583	0.1848	20.00%	20.00%	1,917	1,917	92%	92%
73	336	5,589	0.0602	20.00%	20.00%	1,118	1,118	30%	30%
74	639	3,923	0.1629	20.00%	20.00%	763	763	84%	84%
Subtotal	$ 74,424	$ 256,200				$ 58,373	$ 58,373	127%	127%
75 or more	3,223	13,811	0.2334	100.00%	100.00%	13,184	13,184	24%	24%
Totals	$ 155,127	$ 477,810				$ 175,456	$ 175,456	88%	88%

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

($ in thousands of liability)

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	$ 122,962	$ 300,845	0.4087	15.00%	15.00%	$ 45,127	$ 45,127	272%	272%
29	68,082	233,754	0.2913	10.00%	10.00%	23,375	23,375	291%	291%
30	35,807	158,955	0.2253	10.00%	10.00%	15,896	15,896	225%	225%
31	25,740	109,399	0.2353	10.00%	10.00%	10,940	10,940	235%	235%
32	21,769	90,476	0.2406	10.00%	10.00%	9,048	9,048	241%	241%
33	14,059	66,032	0.2129	18.00%	18.00%	11,886	11,886	118%	118%
34	14,615	55,323	0.2642	18.00%	18.00%	9,958	9,958	147%	147%
35	9,693	49,379	0.1963	18.00%	18.00%	8,888	8,888	109%	109%
36	7,802	42,944	0.1817	20.00%	20.00%	8,589	8,589	91%	91%
37	5,986	29,630	0.2020	20.00%	20.00%	5,926	5,926	101%	101%
38	4,218	24,957	0.1690	20.00%	20.00%	4,991	4,991	85%	85%
39	5,441	17,300	0.3145	20.00%	20.00%	3,460	3,460	157%	157%
Subtotal	$ 336,173	$ 1,178,993				$ 158,083	$ 158,083	213%	213%
40 & Over	9,916	43,960	0.2256	100.00%	100.00%	43,960	43,960	23%	23%
Total	$ 682,261	$ 2,401,946				$ 360,126	$ 360,126	189%	189%

($ in thousands of liability)

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	$ 157,131	$ 383,552	0.4097	18.00%	18.00%	$ 69,039	$ 69,039	228%	228%
29	90,236	238,091	0.3790	10.00%	10.00%	29,317	29,317	308%	308%
30	35,431	135,048	0.2624	10.00%	10.00%	17,307	17,307	205%	205%
31	17,722	89,406	0.1982	10.00%	10.00%	11,159	11,159	159%	159%
32	13,436	67,706	0.1985	10.00%	10.00%	8,927	8,927	151%	151%
33	12,947	47,687	0.2715	20.00%	20.00%	11,563	11,563	112%	112%
34	11,021	46,512	0.2369	20.00%	20.00%	10,593	10,593	104%	104%
35	12,308	57,055	0.2157	20.00%	20.00%	12,915	12,915	95%	95%
36	8,028	41,996	0.1912	20.00%	20.00%	8,866	8,866	91%	91%
37	3,212	25,421	0.1263	20.00%	20.00%	6,056	6,056	53%	53%
38	4,502	18,162	0.2479	20.00%	20.00%	4,013	4,013	112%	112%
39	1,486	10,237	0.1452	20.00%	20.00%	2,527	2,527	59%	59%
Subtotal	$ 367,461	$ 1,160,874				$ 192,283	$ 192,283	191%	191%
40 & Over	6,027	35,718	0.1687	100.00%	100.00%	35,718	35,718	17%	17%
Total	$ 373,488	$ 1,196,592				$ 228,001	$ 228,001	164%	164%

($ in thousands of liability)

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	$ 13,968	$ 36,424	0.3835	50.00%	50.00%	$ 18,212	$ 18,212	77%	77%
66	$ 7,426	$ 17,823	0.4167	20.00%	20.00%	$ 3,565	$ 3,565	208%	208%
67	4,116	10,930	0.3766	20.00%	20.00%	2,186	2,186	188%	188%
68	2,622	7,649	0.3428	20.00%	20.00%	1,530	1,530	171%	171%
69	1,015	6,311	0.1608	20.00%	20.00%	1,262	1,262	80%	80%
70	2,056	6,064	0.3390	20.00%	20.00%	1,213	1,213	170%	170%
71	1,232	4,628	0.2661	20.00%	20.00%	926	926	133%	133%
72	880	3,393	0.2595	20.00%	20.00%	679	679	130%	130%
73	146	1,616	0.0900	20.00%	20.00%	323	323	45%	45%
74	117	903	0.1295	20.00%	20.00%	167	167	70%	70%
Subtotal	$ 19,608	$ 59,317				$ 11,849	$ 11,849	165%	165%
75 or more	305	2,375	0.1282	100.00%	100.00%	2,279	2,279	13%	13%
Total	$ 19,913	$ 61,692				$ 14,128	$ 14,128	141%	141%

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

($ in thousands of liability)

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	$ 74,734	$ 173,848	0.4299	50.00%	50.00%	$ 86,924	$ 86,924	86%	86%
66	$ 20,415	$ 57,740	0.3536	25.00%	25.00%	$ 14,435	$ 14,435	141%	141%
67	14,364	40,634	0.3535	20.00%	20.00%	8,054	8,054	178%	178%
68	8,408	24,321	0.3457	20.00%	20.00%	4,807	4,807	175%	175%
69	3,561	13,757	0.2589	20.00%	20.00%	2,688	2,688	132%	132%
70	4,125	12,166	0.3390	20.00%	20.00%	2,395	2,395	172%	172%
71	2,112	8,137	0.2595	20.00%	20.00%	1,602	1,602	132%	132%
72	1,272	4,935	0.2578	20.00%	20.00%	951	951	134%	134%
73	782	3,872	0.2019	20.00%	20.00%	761	761	103%	103%
74	433	2,610	0.1661	20.00%	20.00%	500	500	87%	87%
Subtotal	$ 55,472	$ 168,172				$ 36,194	$ 36,194	153%	153%
75 or more	1,832	8,177	0.2241	100.00%	100.00%	7,981	7,981	23%	23%
Total	$ 57,304	$ 176,349				$ 44,175	$ 44,175	130%	130%

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

($ in thousands of liability)

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	$ 32,605	$ 120,447	0.2707	7.00%	7.00%	$ 8,431	$ 8,431	387%	387%
29	54,386	87,012	0.6250	8.00%	8.00%	6,961	6,961	781%	781%
30	7,855	33,353	0.2355	8.00%	8.00%	2,668	2,668	294%	294%
31	5,743	23,031	0.2494	9.00%	9.00%	2,073	2,073	277%	277%
32	2,202	8,780	0.2508	10.00%	10.00%	878	878	251%	251%
33	1,255	8,274	0.1517	11.00%	11.00%	910	910	138%	138%
34	432	9,526	0.0453	12.00%	12.00%	1,143	1,143	38%	38%
35	1,437	5,757	0.2497	13.00%	13.00%	748	748	192%	192%
36	2,673	4,882	0.5475	14.00%	14.00%	683	683	391%	391%
37	673	3,119	0.2157	18.00%	18.00%	561	561	120%	120%
38	1,362	3,994	0.3410	17.00%	17.00%	679	679	201%	201%
39	0	2,394	0.0000	17.00%	17.00%	407	407	0%	0%
Subtotal	$ 110,622	$ 310,569				$ 26,144	$ 26,144	423%	423%
40 & Over	661	3,924	0.1683	100%	100%	3,924	3,924	17%	17%
Total	$ 111,282	$ 314,492				$ 30,068	$ 30,068	370%	370%

($ in thousands of liability)

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	$ 162,583	$ 532,205	0.3055	8.00%	8.00%	$ 42,576	$ 42,576	382%	382%
29	258,500	429,631	0.6017	8.00%	8.00%	34,371	34,371	752%	752%
30	46,919	168,027	0.2792	9.00%	9.00%	15,122	15,122	310%	310%
31	27,020	102,329	0.2640	10.00%	10.00%	10,233	10,233	264%	264%
32	16,310	58,292	0.2798	11.00%	11.00%	6,412	6,412	254%	254%
33	12,858	52,249	0.2461	12.00%	12.00%	6,270	6,270	205%	205%
34	15,165	52,609	0.2883	18.00%	18.00%	9,470	9,470	160%	160%
35	8,635	37,756	0.2287	18.00%	18.00%	6,796	6,796	127%	127%
36	7,844	28,454	0.2757	18.00%	18.00%	5,122	5,122	153%	153%
37	4,665	20,107	0.2320	18.00%	18.00%	3,619	3,619	129%	129%
38	1,805	9,535	0.1893	19.00%	19.00%	1,812	1,812	100%	100%
39	1,155	5,336	0.2164	20.00%	20.00%	1,067	1,067	108%	108%
Subtotal	$ 563,459	$ 1,496,532				$ 142,870	$ 142,870	394%	394%
40 & Over	4,737	18,256	0.2595	100%	100%	18,256	18,256	26%	26%
Total	$ 568,196	$ 1,514,787				$ 161,126	$ 161,126	353%	353%

($ in thousands of liability)

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	$ 22,796	$ 95,001	0.2400	20.00%	20.00%	$ 19,000	$ 19,000	120%	120%
56	9,052	78,123	0.1159	14.00%	20.00%	10,937	15,625	83%	58%
57	9,851	68,059	0.1447	50.00%	20.00%	34,029	13,612	29%	72%
58	7,652	66,140	0.1157	12.00%	10.00%	7,937	6,614	96%	116%
59	9,108	58,513	0.1557	12.00%	10.00%	7,022	5,851	130%	156%
60	6,069	55,091	0.1102	12.00%	10.00%	6,611	5,509	92%	110%
61	11,124	50,934	0.2184	12.00%	25.00%	6,112	12,733	182%	87%
62	12,782	41,446	0.3084	35.00%	25.00%	14,506	10,362	88%	123%
63	5,382	29,186	0.1844	25.00%	25.00%	7,297	7,297	74%	74%
64	3,872	20,390	0.1899	25.00%	25.00%	5,097	5,097	76%	76%
65	4,977	18,669	0.2666	30.00%	25.00%	5,601	4,667	89%	107%
66	4,070	13,685	0.2974	30.00%	25.00%	4,106	3,421	99%	119%
67	1,373	8,292	0.1656	30.00%	25.00%	2,488	2,073	55%	66%
68	1,943	6,891	0.2820	30.00%	25.00%	2,067	1,723	94%	113%
69	958	4,289	0.2233	30.00%	25.00%	1,287	1,072	74%	89%
70	308	3,472	0.0888	100.00%	100.00%	3,472	3,472	9%	9%
71	893	3,177	0.2810	100.00%	100.00%	3,177	3,177	28%	28%
72	408	2,029	0.2010	100.00%	100.00%	2,029	2,029	20%	20%
73	396	1,225	0.3234	100.00%	100.00%	1,225	1,225	32%	32%
74	0	320	0.0000	100.00%	100.00%	320	320	0%	0%
Subtotal	$ 113,015	$ 624,933				$ 144,320	$ 124,880	78%	90%
75 or more	145	981	0.1475	100.00%	100.00%	981	981	15%	15%
Total	$ 113,160	$ 625,914				$ 145,301	$ 125,861	78%	90%

($ in thousands of liability)

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	$ 63,286	$ 162,284	0.3900	18.00%	40.00%	$ 29,211	$ 64,913	217%	97%
26	9,722	99,806	0.0974	13.00%	10.00%	12,975	9,981	75%	97%
27	9,230	85,311	0.1082	11.00%	10.00%	9,384	8,531	98%	108%
28	8,792	81,723	0.1076	11.00%	10.00%	9,986	8,172	88%	108%
29	8,841	66,245	0.1335	11.00%	10.00%	8,321	6,625	106%	133%
30	7,187	49,766	0.1444	11.00%	10.00%	6,769	4,977	106%	144%
31	4,418	36,691	0.1204	11.00%	10.00%	4,478	3,669	99%	120%
32	5,048	26,541	0.1902	11.00%	10.00%	3,664	2,654	138%	190%
33	2,835	18,605	0.1524	11.00%	10.00%	2,654	1,860	107%	152%
34	2,545	19,280	0.1320	11.00%	10.00%	3,003	1,928	85%	132%
35	2,099	17,305	0.1213	11.00%	10.00%	3,299	1,731	64%	121%
36	1,480	13,865	0.1067	11.00%	10.00%	3,355	1,386	44%	107%
37	1,543	9,862	0.1565	11.00%	10.00%	1,384	986	111%	156%
38	1,428	8,494	0.1681	11.00%	10.00%	934	849	153%	168%
39	1,638	7,455	0.2198	11.00%	10.00%	1,131	746	145%	220%
Subtotal	$ 130,092	$ 703,233				$ 100,549	$ 119,008	129%	109%
40 & Over	330	9,047	0.0365	100.00%	100.00%	9,047	9,047	4%	4%
Total	$ 130,422	$ 712,280				$ 109,597	$ 128,056	119%	102%

($ in thousands of liability)

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	$ 1,112	0.0000	12%	10%	$ 133	$ 111	0%	0%
16	0	2,184	0.0000	12%	10%	262	218	0%	0%
17	0	1,072	0.0000	12%	10%	129	107	0%	0%
18	0	0	N/A	12%	10%	0	0	0%	0%
19	0	0	N/A	12%	10%	0	0	0%	0%
20	2,383	3,633	0.6560	31%	50%	1,139	1,817	209%	131%
21	0	1,219	0.0000	40%	20%	487	244	0%	0%
22	0	2,483	0.0000	40%	20%	993	497	0%	0%
23	1,070	2,258	0.4737	27%	20%	604	452	177%	237%
24	0	0	N/A	27%	20%	0	0	0%	0%
25	5,036	29,771	0.1692	36%	20%	10,731	5,954	47%	85%
26	5,110	18,076	0.2827	20%	10%	3,613	1,808	141%	283%
27	1,298	17,756	0.0731	15%	10%	2,663	1,776	49%	73%
28	0	20,074	0.0000	15%	10%	3,011	2,007	0%	0%
29	2,017	20,323	0.0992	15%	10%	3,048	2,032	66%	99%
30	1,847	20,256	0.0912	15%	10%	3,038	2,026	61%	91%
31	3,249	25,552	0.1271	16%	10%	4,067	2,555	80%	127%
Subtotal	$ 22,010	$ 165,769				$ 33,921	$ 21,604	65%	102%
32	$ 13,501	$ 18,754	0.7199	100%	100%	$ 18,754	$ 18,754	72%	72%
33	1,762	1,762	1.0000	100%	100%	1,762	1,762	100%	100%
Subtotal	$ 15,262	$ 20,515				$ 20,516	$ 20,516	74%	74%
Total	$ 37,272	$ 186,285				$ 54,437	$ 42,120	68%	88%

* 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)

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	40.0%	50.0%	0.0	0.0	0%	0%
41	0	0	N/A	40.0%	50.0%	0.0	0.0	0%	0%
42	0	0	N/A	40.0%	50.0%	0.0	0.0	0%	0%
43	0	0	N/A	40.0%	50.0%	0.0	0.0	0%	0%
44	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
45	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
46	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
47	0	0	N/A	40.0%	50.0%	0.0	0.0	0%	0%
48	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
49	0	0	N/A	40.0%	50.0%	0.0	0.0	0%	0%
50	0	1	0.0000	40.0%	50.0%	0.4	0.5	0%	0%
51	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
52	4	4	1.0000	40.0%	50.0%	1.6	2.0	250%	200%
53	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
54	0	0	N/A	40.0%	50.0%	0.0	0.0	0%	0%
55	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
56	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
57	1	1	1.0000	40.0%	50.0%	0.4	0.5	250%	200%
58	0	1	0.0000	40.0%	50.0%	0.4	0.5	0%	0%
59	4	4	1.0000	40.0%	50.0%	1.6	2.0	250%	200%
60	4	22	0.1818	40.0%	50.0%	8.8	11.0	45%	36%
61	1	17	0.0588	7.0%	10.0%	1.2	1.7	83%	59%
62	1	16	0.0625	7.0%	10.0%	1.1	1.6	91%	63%
63	4	15	0.2667	7.0%	10.0%	1.1	1.5	364%	267%
64	2	15	0.1333	7.0%	10.0%	1.1	1.5	182%	133%
65	0	13	0.0000	15.0%	20.0%	2.0	2.6	0%	0%
66	1	14	0.0714	15.0%	20.0%	2.1	2.8	48%	36%
67	1	14	0.0714	15.0%	20.0%	2.1	2.8	48%	36%
68	1	13	0.0769	15.0%	20.0%	2.0	2.6	50%	38%
69	2	9	0.2222	15.0%	20.0%	1.4	1.8	143%	111%
Subtotal	**34**	**167**				**30.5**	**39.4**	**111%**	**86%**
70+	6	45	0.1333	100.0%	100.0%	45.0	45.0	13%	13%
Total	40	212				75.5	84.4	53%	47%

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.)

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	8	586	0.0137	10.0%	2.5%	58.6	14.7	14%	54%
21	16	725	0.0221	10.0%	2.5%	72.5	18.1	22%	88%
22	9	722	0.0125	10.0%	2.5%	72.2	18.1	12%	50%
23	6	790	0.0076	10.0%	2.5%	79.0	19.8	8%	30%
24	15	775	0.0194	10.0%	2.5%	77.5	19.4	19%	77%
25	10	742	0.0135	10.0%	5.0%	74.2	37.1	13%	27%
26	12	665	0.0180	10.0%	5.0%	66.5	33.3	18%	36%
27	7	587	0.0119	10.0%	5.0%	58.7	29.4	12%	24%
28	8	517	0.0155	10.0%	5.0%	51.7	25.9	15%	31%
29	8	475	0.0168	10.0%	5.0%	47.5	23.8	17%	34%
Subtotal	**99**	**6,584**				**658.4**	**239.6**	**15%**	**41%**
30+	61	1,821	0.0335	100.0%	100.0%	N/A	N/A	N/A	N/A
Total	160	8,405							

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.)

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	$ 7,015	$ 63,356	0.1107	4.00%	10.00%	$ 2,534	$ 6,336	277%	111%
56	7,094	63,824	0.1111	4.00%	9.00%	2,553	5,744	278%	123%
57	3,478	58,309	0.0596	4.00%	9.00%	2,332	5,248	149%	66%
58	7,564	55,636	0.1360	4.00%	9.00%	2,225	5,007	340%	151%
59	2,639	46,198	0.0571	4.00%	9.00%	1,848	4,158	143%	63%
60	10,006	198,971	0.0503	5.00%	9.00%	9,949	17,907	101%	56%
61	8,035	181,561	0.0443	5.00%	9.00%	9,078	16,341	89%	49%
62	28,892	169,101	0.1709	14.00%	22.00%	23,674	37,202	122%	78%
63	16,605	138,991	0.1195	10.00%	16.00%	13,899	22,238	119%	75%
64	16,483	122,611	0.1344	10.00%	16.00%	12,261	19,618	134%	84%
Total	$ 107,810	$ 1,098,559				$ 80,354	$ 139,799	134%	77%

($ in thousands of liability)

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	$ 5,414	$ 83,217	0.0651	4.00%	9.00%	$ 3,329	$ 7,490	163%	72%
56	4,965	73,627	0.0674	4.00%	10.00%	2,945	7,363	169%	67%
57	6,641	77,391	0.0858	4.00%	10.00%	3,096	7,739	215%	86%
58	6,927	71,099	0.0974	4.00%	11.00%	2,844	7,821	244%	89%
59	5,879	66,592	0.0883	4.00%	11.00%	2,664	7,325	221%	80%
60	23,433	279,646	0.0838	7.00%	11.00%	19,575	30,761	120%	76%
61	20,011	251,633	0.0795	7.00%	11.00%	17,614	27,680	114%	72%
62	41,843	216,430	0.1933	13.00%	20.00%	28,136	43,286	149%	97%
63	26,282	173,177	0.1518	13.00%	18.00%	22,513	31,172	117%	84%
64	23,340	148,955	0.1567	13.00%	18.00%	19,364	26,812	121%	87%
Total	$ 164,735	$ 1,441,766				$ 122,080	$ 197,449	135%	83%

($ in thousands of liability)

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	$ 1,802	$ 23,515	0.0766	2.00%	10.00%	$ 470	$ 2,352	383%	77%
56	1,614	16,613	0.0972	2.00%	11.00%	332	1,827	486%	88%
57	2,489	15,208	0.1636	2.00%	11.00%	304	1,673	818%	149%
58	1,657	13,247	0.1251	2.00%	11.00%	265	1,457	625%	114%
59	1,308	9,363	0.1397	2.00%	11.00%	187	1,030	698%	127%
60	5,285	56,396	0.0937	5.00%	11.00%	2,820	6,204	187%	85%
61	6,792	54,259	0.1252	6.00%	11.00%	3,256	5,969	209%	114%
62	11,073	49,600	0.2232	12.00%	22.00%	5,952	10,912	186%	101%
63	9,301	43,829	0.2122	12.00%	22.00%	5,259	9,642	177%	96%
64	9,203	34,529	0.2665	9.00%	22.00%	3,108	7,596	296%	121%
Total	$ 50,524	$ 316,561				$ 21,953	$ 48,662	230%	104%

($ in thousands of liability)

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	$ 5,545	$ 81,666	0.0679	2.00%	9.00%	$ 1,633	$ 7,350	339%	75%
56	10,922	81,707	0.1337	2.00%	9.00%	1,634	7,354	668%	149%
57	8,997	74,348	0.1210	2.00%	10.00%	1,487	7,435	605%	121%
58	10,240	89,462	0.1145	2.00%	10.00%	1,789	8,946	572%	114%
59	6,706	75,408	0.0889	2.00%	10.00%	1,508	7,541	445%	89%
60	33,043	270,784	0.1220	6.00%	10.00%	16,247	27,078	203%	122%
61	33,683	238,503	0.1412	6.00%	13.00%	14,310	31,005	235%	109%
62	41,420	204,913	0.2021	11.00%	20.00%	22,540	40,983	184%	101%
63	44,497	163,716	0.2718	10.00%	20.00%	16,372	32,743	272%	136%
64	30,030	121,740	0.2467	10.00%	20.00%	12,174	24,348	247%	123%
Total	$ 225,083	$ 1,402,246				$ 89,695	$ 194,783	251%	116%

($ in thousands of liability)