Segal Consulting

South Carolina Public Employee Benefit Authority

LIMITED SCOPE AUDIT OF THE JULY 1, 2016 ACTUARIAL VALUATIONS

May 31, 2017

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May 31, 2017

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

Re: **Limited Scope (Level 2) Audit of the July 1, 2016 Actuarial Valuations
for the South Carolina Public Employee Benefit Authority**

Dear Members of the Board:

We are pleased to present the results of Segal's actuarial audit of the July 1, 2016 actuarial
valuations of:

> the South Carolina Retirement System (SCRS),

> the Police Officers Retirement System (PORS),

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

> the Retirement System of Members of the General Assembly of the State of South Carolina
  (GARS), and

> the South Carolina National Guard Supplemental Retirement Plan (SCNG).

The purpose of this audit is to conduct a review of the actuarial methods, assumptions, and
procedures employed by the Public Employee Benefit Authority (PEBA) and its retained
actuary, Gabriel Roeder Smith & Company (GRS).

This audit includes the following:

> **Report review:** a review of each valuation report and the results provided to PEBA,
  including a determination of compliance with actuarial standards, and whether the
  valuation reports reflect appropriate disclosure information under required reporting.

> **Validation of benefits valued through test lives and data review:** discussion of the
  procedures used to validate the participant data and the test lives selected, with a detailed
  review of the findings.

> **Methods and assumptions review:** an analysis and benchmarking of the actuarial assumptions and a review of the actuarial methods used in determining the funded status and accrued liability as of July 1, 2016 for compliance with generally accepted actuarial principles.

This review was conducted under the supervision of Kim Nicholl, a Fellow of the Society of Actuaries, a member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA, and Rocky Joyner, an Associate of the Society of Actuaries, a member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA. This review was conducted in accordance with the standards of practice prescribed by the Actuarial Standards Board.

The assistance of the PEBA staff and GRS is gratefully acknowledged.

We appreciate the opportunity to serve as an independent actuarial advisor for PEBA and we are available to answer any questions you may have on this report.

Sincerely,

Kim Nicholl, FSA, MAAA, EA
Senior Vice President and Actuary

Leon F. (Rocky) Joyner, Jr., FCA, ASA, MAAA, EA
Vice President and Actuary

cc: Travis Turner
        Tammy Nichols

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**Limited Scope Audit of the July 1, 2016 Actuarial Valuations for the
South Carolina Public Employee Benefit Authority**

May 31, 2017

Executive Summary

The South Carolina Public Employee Benefit Authority (PEBA) retained Segal Consulting (Segal) to conduct an independent level 2 actuarial audit of the July 1, 2016 actuarial valuations performed by the PEBA actuary, Gabriel Roeder Smith & Company (GRS).

PEBA requested the following:

> Verification of demographic data, including the degree to which data is sufficient to support the conclusions of the investigation, and the use and appropriateness of any assumptions made regarding the data;

> A review of the current actuarial assumptions, procedures and methodology for reasonableness and compliance with the state statutes, funding standards and generally accepted actuarial standards, as well as appropriateness and internal consistency;

> Independent verification and analysis of the actuarial valuation results; and

> Recommendations to improve the quality and understanding of the actuarial valuation reports.

The objective of a **level 2** or **limited scope actuarial audit** (actuarial review) of any system is to provide validation that the liabilities and costs of the system are reasonable and are calculated as intended. This audit is not a full replication of the actuarial valuation results, but rather is a review of the key components in the valuation process that encompass the derivation of the liabilities and costs for the five Systems. These key components are the data, the benefits valued, the actuarial assumptions and funding method used, and the asset valuation method employed. The valuation data, the valuation reports, and the valuation output for a select group of test lives provide the detail necessary to validate each of these key components.

We reviewed all information supplied to us. We also requested and reviewed additional information provided by GRS. Finally, we considered the reasonableness of the actuarial assumptions and methods in the context of our own experience, and those of other state and local pension systems.

We also performed a review of the June 30, 2015 Experience Study prepared by GRS, and our analysis and comments are presented in this report.

Conclusions

Overall, it is our opinion that the results of the actuarial valuations are reasonable, consistent, and accurate.

The data appears complete and we were able to match the member counts and other demographic information reported by GRS within acceptable limits.
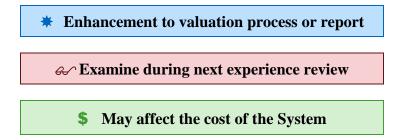
The actuarial cost methods used for the Systems are mainstream methods that are appropriate for determining ongoing costs and other liabilities. We found that both the actuarial cost method and asset valuation method conform to the appropriate Standards of Practice promulgated by the Actuarial Standards Board.

In general, benefits valued for selected test lives are consistent with those stated in the actuarial valuation reports and other supporting documents. We believe that the results of the July 1, 2016 actuarial valuations (including the actuarial accrued liability, normal cost, and determination of expected employer contributions) are substantially accurate.

Finally, we offer ideas to improve the quality and understanding of the valuation reports and correct a few inconsistencies noted in the test lives. Several suggestions and recommendations are made throughout this document. We would classify them as:

> suggestions to enhance the valuation process or report

> an assumption to be examined during the next experience review

> a change that may affect the cost of the Systems

We have identified our more significant comments by type based on the following colors and icons:

✸ **Enhancement to valuation process or report**

〰 **Examine during next experience review**

$ **May affect the cost of the System**

However, we believe that the aggregate effect of all suggested changes is not material.

As part of our analysis, we also reviewed the assumptions used in the actuarial valuation reports as of July 1, 2016 as determined in the June 30, 2015 experience review and found them to be generally reasonable. Specifically, the economic assumptions are internally consistent and within norms for the peer group. Other assumptions such as salary scale, mortality rates, retirement rates, turnover and disability rates are consistent with the findings of the June 30, 2015 experience studies.

Purpose, Scope and Methodology of the Audit

Purpose of the Audit

PEBA retained Segal to conduct an independent review of the Systems' July 1, 2016 actuarial valuations. With respect to the valuations, PEBA requested:

➤ Verification of demographic data, including the degree to which data is sufficient to support the conclusions of the investigation, and the use and appropriateness of any assumptions made regarding the data;

➤ A review of the current actuarial assumptions, procedures and methodology for reasonableness and compliance with the state statutes, funding standards and generally accepted actuarial standards, as well as appropriateness and internal consistency;

➤ Independent verification and analysis of the actuarial valuation results; and

➤ Recommendations to improve the quality and understanding of the actuarial valuation reports.

Scope of the Audit

This actuarial audit has a specified and limited scope. A full scope audit would include performing the 2016 actuarial valuations from start to finish, in essence, parallel valuations. This limited scope or level 2 audit is a review of the valuations already performed, through a review of the benefits, assumptions, and methods, without a full replication of the actuarial valuation results. We conducted this review by analyzing detailed output of certain selected test lives from the membership group.

By not performing a full parallel valuation, the following assumptions are made:

➤ The current actuary's valuation system is accurately applying each assumption consistent with the test life review.

➤ The valuation system is adding together liabilities appropriately for each decrement (retirement, turnover, disability, and death), for each member, and over the entire population (in other words, no participant group is "dropped off" and no particular liabilities are omitted).

What a limited scope or level 2 audit can provide is:

➤ Assurance that the appropriate benefits are being valued;

➤ Confirmation that the valuation system is accurately applying decrements to the test lives;

➤ Confirmation that the program is valuing benefits as described in the valuation reports and consistent with applicable statutes;

> A measurement of economic actuarial assumptions against a peer group and hence an assessment of their reasonableness;

> A review of the reasonableness of the actuarial funding and asset valuation methods;

> An indication as to whether the liabilities and contribution rates shown are reasonable and correctly calculated; and

> An assessment of whether the valuation appropriately discloses the required information under the appropriate reporting standards.

Methodology of the Audit

The purpose of this audit is to express an opinion regarding the reasonableness and accuracy of the actuarial assumptions, methods, valuation results, and contribution rates. The limited scope review is not the same as an actuarial valuation, but represents a "second opinion" on the findings and processes included in the valuation.

The measurement of the reasonableness of the funding levels encompasses three key analyses:

> a verification of the benefits being projected for future payment;

> a verification of the appropriateness of the actuarial assumptions that are used in calculating the liability; and

> a verification of the appropriateness of the funding and asset valuation methods.

Benefits Analysis

Critical to projecting future benefits is receiving complete and accurate data. We reviewed the process by which data is prepared for the actuarial valuation, including an assessment of the completeness of the data and a review of the data screening process employed.

We also performed a thorough examination of individual test life calculations, to confirm that the GRS model projects benefits in a manner consistent with the Summary of Plan Provisions in their valuation reports.

These test lives were prepared by GRS following a request from Segal for detailed information on specific categories of participants from each System.

Assumptions Analysis

The second critical component in assessing the reasonableness of the funding levels is in the selection and the application of the actuarial assumptions. With respect to the assumptions, we independently determined the reasonability of the investment return assumption by using Segal Marco Advisors' capital market assumptions, benchmarked the economic assumptions against a survey of state and local employee retirement systems, and reviewed the demographic assumptions individually and in aggregate through a review of the report and the test lives.

Methods Analysis

The third component in assessing funding levels is the selection and application of the actuarial cost method (including the method for amortizing the unfunded actuarial accrued liability), the asset valuation method (including smoothing techniques) and the amortization of unfunded actuarial accrued liability.

Review of Valuation Data

Data Used in the Valuations

We independently obtained data files directly from PEBA and GRS. Based on the codes included in the data, we determined which records (in the PEBA files) were in each category, and which belonged to various subgroups within the Systems. With minimal data scrubbing, we found that the counts for the active and retired files were relatively close, and well within the 5% threshold we established for determining materiality of differences. Deferred vested members presented more of a challenge due to the lack of an accrued benefit in the data, which necessitated a calculation estimate of the benefit for each member in these categories. Even for these, we were predominately within 5%. As the impact on plan funding for inactive members is relatively small compared to actives and retired members, we suggest that, in the future, steps be taken to improve this data as opportunities arise.

All data files for active participants, inactive participants, annuitants and beneficiaries were provided as of the valuation date (July 1, 2016). GRS also provided additional notes and procedures not specifically outlined in the valuation reports. These notes and procedures addressed the handling of data for specific groups, how specific benefit features were incorporated in the valuation programs, and listed assumptions made in cases of missing or inconsistent data. Given the large amount of data in the Systems, having an established and reasonable procedure in place to handle missing information shortens the amount of time spent on data reconciliation (for both GRS and PEBA) without sacrificing any material accuracy in the valuation results. For Systems of this size, the data was quite clean, with a very small percentage of missing information.

We found two minor items during our review:

1. The classification of inactive participants in the GARS plan into vested and nonvested categories was inconsistent with this system's vesting period of eight years. We have determined that 13 of the 32 inactive participants were vested, whereas GRS's valuation indicates that only five were vested.

> **$** The liability for GARS inactive vested participants is the greater of the employee contribution balance or the present value of the vested benefit payable at age 60. GRS valued only a return of contributions for eight participants, rather than determining the greater value. Segal does not believe that this is a significant issue, as the inactive vested liability is only a minor portion of the total liability.

2. The data provided to GRS by PEBA does not include accrued retirement benefits for inactive vested members. GRS estimates the accrued retirement benefit and supplied us with that methodology.

> **$** We encourage PEBA to capture the benefit information for vested individuals upon termination of employment, if possible. This would allow costs to be more accurately predicted by the actuary, although the liability for inactive vested members with deferred benefits is a small fraction of the overall System liability.

The tables that follow summarize our determination of key data elements compared to those shown in the valuation report. Generally, aside from the items listed above, we were able to match information reported by GRS to within 2.0% with minimal data scrubbing. As previously mentioned, this is well within the reasonable limit of 5%. We recognize that GRS spends a significant amount of time reconciling the data and aggregating counts for members that may appear in multiple categories. We believe their process is sound, and are not concerned with the minor differences in the member counts and statistics.

South Carolina Retirement System (SCRS)
Analysis of Valuation Data as of July 1, 2016

	GRS	Segal	% Difference
Active Members			
State Employees			
Number	51,018	51,007	0.02%
Total payroll	$2,321,521,000	$2,325,892,642	0.19%
Average salary	$45,504	$45,599	0.21%
Average age	N/A	45.1	N/A
Average service	N/A	10.4	N/A
Public School Employees			
Number	84,916	84,910	-0.01%
Total payroll	$3,357,550,000	$3,359,826,937	0.07%
Average salary	$39,540	$39,569	0.07%
Average age	N/A	44.3	N/A
Average service	N/A	10.7	N/A
Other Agency Employees			
Number	54,989	54,972	-0.03%
Total payroll	$2,211,836,000	$2,216,491,837	0.21%
Average salary	$40,223	$40,320	0.24%
Average age	N/A	44.3	N/A
Average service	N/A	8.5	N/A
Total			
Number	190,923	190,889	-0.02%
Total payroll	$7,890,906,774	$7,902,211,417	0.14%
Average salary	$41,330	$41,397	0.16%
Average age	45.1	44.6	-1.11%
Average service	10.1	10.0	-0.99%
Inactive Members			
Terminated employees entitled to benefits but not yet in pay status			
Number	20,892	20,887	-0.02%
Total Annual Deferred Benefits	$136,821,761	$130,430,193	-4.67%
Non-vested inactive members who have not contributed for more than 5 years			
Number	148,914	148,480	-0.29%
Total Contributions	$222,769,215	$237,234,014	6.49%

	GRS	Segal	% Difference
Service Retirees			
Number	115,338	114,963	-0.33%
Annual benefits	$2,469,794,069	$2,467,571,252	-0.09%
Average benefit	$13,898	$13,909	0.23%
Average age	69.8	69.3	-0.72%
Disability Retirees			
Number	13,133	13,076	0.43%
Annual benefits	$182,525,500	$181,876,129	0.36%
Average benefit	$13,898	$13,909	0.08%
Average age	64.2	63.6	-0.93%
Beneficiaries			
Number	9,384	9,424	0.43%
Annual benefits	$114,143,577	$116,138,969	1.75%
Average benefit	$12,164	$12,324	1.32%
Average age	67.7	68.1	0.64%
TERI and Rehired Retired Participants			
Number	22,471	22,474	0.01%
Annual benefits	N/A	$51,033,226	N/A
Average benefit	N/A	$2,271	N/A
Average age	N/A	62.7	N/A

Police Officers Retirement System (PORS)
Analysis of Valuation Data as of July 1, 2016

	GRS	Segal	% Difference
Active Members			
State Employees			
Number	9,134	9,137	0.03%
Total payroll	$361,065,000	$361,721,896	0.18%
Average salary	N/A	$39,589	N/A
Average age	N/A	42.1	N/A
Average service	N/A	10.33	N/A
Other Agency Employees			
Number	17,517	17,513	-0.02%
Total payroll	$775,337,000	$776,193,483	0.11%
Average salary	N/A	$44,321	N/A
Average age	N/A	38.1	N/A
Average service	N/A	9.56	N/A
Total			
Number	26,651	26,650	0.00%
Total payroll	$1,136,401,231	$1,137,915,379	0.13%
Average salary	$42,640	$42,699	0.14%
Average age	39.5	39.4	-0.25%
Average service	9.8	9.8	0.00%
Inactive Members			
Terminated employees entitled to benefits but not yet in pay status			
Number	2,450	2,444	-0.24%
Total Annual Deferred Benefits	$19,422,226	$18,522,830	-4.86%
Non-vested inactive members who have not contributed for more than 5 years			
Number	12,551	12,555	0.03%
Total Contributions	$31,246,437	$31,279,197	0.10%
Service Retirees			
Number	13.361	13,376	0.11%
Annual benefits	$53,142,503	$53,143,904	0.00%
Average benefit	$20,668	$20,668	0.00%
Average age	64.9	65.0	0.15%

	GRS	Segal	% Difference
Disability Retirees			
Number	2,578	2,574	0.00%
Annual benefits	$53,142,503	$53,148,295	0.00%
Average benefit	$20,614	$20,646	0.00%
Average age	54.8	54.8	0.00%
Beneficiaries			
Number	1,349	1,349	0.00%
Annual benefits	$16,583,402	$16,590,522	0.04%
Average benefit	$12,293	$12,298	0.04%
Average age	67.7	67.6	-0.15%

Retirement System for Judges and Solicitors (JSRS)
Analysis of Valuation Data as of July 1, 2016

	GRS	Segal	% Difference
Active Members			
Number	157	158	0.64%
Total payroll*	$21,958,224*	$21,808,760	-0.68%
Average salary	$139,861	$138,030	-1.31%
Average age	57.2	57.2	0.00%
Average service	15.4	15.5	0.65%
Nonvested Inactive Members			
Number	2	2	0.00%
Average Age	N/A	55.3	N/A
Average Service	N/A	2.6	N/A
Service Retirees			
Number	155	155	0.00%
Annual benefits	$16,123,054	$16,123,042	0.00%
Average benefit	$104,020	$104,020	0.00%
Average age	71.1	71.2	0.14%
Disabled Retirees			
Number	0	0	0.00%
Annual benefits	$0	$0	0.00%
Average benefit	$0	$0	0.00%
Average age	0	0	0.00%
Beneficiaries			
Number	55	55	0.00%
Annual benefits	$1,593,995	$1,153,998	0.00%
Average benefit	$28,982	$28,982	0.00%
Average age	69.8	69.8	0.00%
Total Pay Status			
Number	210	210	0.00%
Annual benefits	$17,717,049	$17,717,040	0.00%
Average benefit	$84,367	$84,367	0.00%
Average age	N/A	70.8	N/A

*GRS amount based on filled and unfilled positions. Segal amount includes estimated salary for DROP and Retired-in-Place members for which no salary information was provided. Payroll was then projected to the upcoming fiscal year as mentioned in the GRS report.

Retirement System for Members of the General Assembly (GARS)
Analysis of Valuation Data as of July 1, 2016

	GRS	Segal	% Difference
Active Members			
State Employees			
Number	102	102	0.00%
Total payroll	$2,316,400	$2,316,400	0.00%
Average salary	$22,710	$22,710	0.00%
Average age	56.4	56.4	0.00%
Average service	14.3	14.6	0.00%
Special Contributors			
Number	17	17	0.00%
Total member contributions with interest	$855,187	$855,187	0.00%
Average age	N/A	50.7	N/A
Average service	N/A	16.3	N/A
Inactive Members			
Vested Inactive			
Number	5	13	160.00%
Total annual deferred benefits	$228,395	$336,411	47.29%
Average age	N/A	56.4	N/A
Average service	N/A	17.1	N/A
Non-Vested Inactive			
Number	27	19	-29.63%
Member contributions with interest	$753,103	$190,150	-74.75%
Average age	N/A	51.5	N/A
Average service	N/A	2.7	N/A
Service Retirees			
Number	279	279	0.00%
Annual benefits	$5,498,678	$5,498,669	0.00%
Average benefit	$19,709	$19,708	0.00%
Average age	73.5	73.6	0.14%
Disabled Retirees			
Number	0	0	0.00%
Annual benefits	$0	$0	0.00%
Average benefit	$0	$0	0.00%
Average age	N/A	N/A	0.00%

	GRS	Segal	% Difference
Beneficiaries			
Number	79	79	0.00%
Annual benefits	$1,115,212	$1,115,216	0.00%
Average benefit	$14,117	$14,117	0.00%
Average age	76.9	76.8	0.13%
Total Pay Status			
Number	358	358	0.00%
Annual benefits	$6,613,890	$6,613,885	0.00%
Average benefit	$18,475	$18,475	0.00%
Average age	N/A	74.3	N/A

National Guard Supplemental Retirement Plan (SCNG)
Analysis of Valuation Data as of July 1, 2016

	GRS	Segal	% Difference
Active Members			
Number	12,253	12,256	0.02%
Average age	32.2	32.2	0.00%
Average service	9.7	9.7	0.00%
Inactive Members			
Number	1,969	1,970	0.05%
Average Age	54.1	N/A	N/A
Average Service	23.3	N/A	N/A
Service Retirees			
Number	4,709	4,710	0.02%
Annual benefits	$4,296,660	$4,306,660	0.23%
Average benefit	$912	$914	0.22%
Average age	70.6	70.0	-0.85%

Validation of Liability Calculations

Segal requested specific test lives in order to compare the benefit amounts projected in the valuation against our understanding of the PEBA benefits summarized in the valuation report and member handbook for each plan. We asked for new entrants, and members who were expected to qualify for different retirement eligibilities. In addition, we asked for current retirees receiving varying payment options, disability retirees, surviving beneficiaries, and inactive members entitled to deferred benefits. We received output for a total of 38 active members, 30 nonactive members in pay status, four inactive vested members, two TERI participants, and one JSRS member who "retired in place". Key characteristics of these members are outlined below.

SOUTH CAROLINA RETIREMENT SYSTEM (SCRS)

Active Test Lives		
Group	**Class**	**Description**
Teacher	Class 2	Attains 25 years of service prior to age 55
		Attains 25 years of service between ages 55 and 60
		Reaches age 60 prior to attaining 25 years of service
		Reaches age 65 with between five and 28 years of service
		Less than five years of service at age 65
	Class 3	Attains eight years of service prior to age 60
		Attains eight years of service between ages 60 and 65
		Reaches age 65 prior to attaining eight years of service
		Satisfies the Rule of 90 prior to age 65
General	Class 2	Attains 25 years of service prior to age 55
		Attains 25 years of service between ages 55 and 60
		Reaches age 60 prior to attaining 25 years of service
		Reaches age 65 with between five and 28 years of service
		Less than five years of service at age 65
	Class 3	Attains eight years of service prior to age 60
		Attains eight years of service between ages 60 and 65
		Reaches age 65 prior to attaining eight years of service
		Satisfies the Rule of 90 prior to age 65

Non-Active Test Lives		
Group	**Status**	**Form of Payment**
Teacher	Service Retiree	Option B (100% Joint & Survivor with Pop-up)
		Social Security Level Income Option
	Disabled Retiree	50% Joint & Survivor without Pop-up
	Surviving Spouse	Single Life Annuity
	TERI Participant	Option A (Single Life Annuity)
	Inactive Vested	Not Yet Elected
General	Service Retiree	Option C (50% Joint & Survivor with Pop-up)
		Single Life Annuity with 10 Year Certain Period
	Disabled Retiree	Option A (Single Life Annuity)
		100% Joint and Survivor without Pop-up
	Surviving Spouse	Single Life Annuity
	TERI Participant	Option C (50% Joint & Survivor with Pop-up)

POLICE OFFICERS RETIREMENT SYSTEM (PORS)

Active Test Lives	
Class	**Description**
Class 2	Attains 25 years of service prior to age 55 Attains 25 years of service after age 55 Hired after age 50
Class 3	Attains 27 years of service prior to age 55 Attains 27 years of service after age 55 Hired after age 47

Non-Active Test Lives	
Status	**Form of Payment**
Service Retiree	Option B (100% Joint & Survivor with Pop-up) Social Security Level Income Option 50% Joint & Survivor without Pop-up
Disabled Retiree	Option A (Single Life Annuity) Option C (50% Joint & Survivor with Pop-up) 100% Joint & Survivor without Pop-up
Surviving Spouse	Single Life Annuity Single Life Annuity
Inactive Vested	Not Yet Elected

SOUTH CAROLINA NATIONAL GUARD (SCNG)

Active Test Lives
Description
Attains 20 years of service prior to age 60
Less than 20 years of service at age 60
Member with prior military service outside of the National Guard of South Carolina

Non-Active Test Lives	
Status	**Form of Payment**
Service Retiree	Single Life Annuity Single Life Annuity
Inactive Vested	Single Life Annuity

RETIREMENT SYSTEM FOR JUDGES AND SOLICITORS (JSRS)

Active Test Lives	
Group	**Description**
Judge	Attains 20 years of service prior to age 65
	Attains 20 years of service between ages 65 and 70
	Less than 20 years of service at age 70
	Attains 25 years of service prior to age 65
Public Defender	Attains 20 years of service prior to age 65
	Attains 20 years of service between ages 65 and 70
	Less than 20 years of service at age 70
Solicitor	Attains 24 years of service prior to age 65

Non-Active Test Lives	
Status	**Form of Payment**
Service Retiree	Standard Annuity Payment (Single Life Annuity)
	Optional Allowance (One-Third Joint & Survivor with Non-Spouse Beneficiary)
Retired In Place	Standard Annuity Payment (Single Life Annuity)
Surviving Spouse	Single Life Annuity
	Single Life Annuity

RETIREMENT SYSTEM FOR MEMBERS OF GENERAL ASSEMBLY (GARS)

Active Test Lives
Description
Attains 30 years of service prior to age 60
Less than 30 years of service at age 60
Less than eight years of service at age 60

Non-Active Test Lives	
Status	**Form of Payment**
Service Retiree	Maximum Option (Single Life Annuity)
	Option 1 (100% Joint & Survivor with Pop-up)
	Option 1A (100% Joint & Survivor without Pop-up)
	Option 2 (50% Joint & Survivor with Pop-up)
	Option 2A (50% Joint & Survivor without Pop-up)
Surviving Spouse	Single Life Annuity
	Single Life Annuity
Inactive Vested	Not Yet Elected

We did not run a "parallel" valuation, which is beyond the scope of this audit. Rather, we reviewed in detail the calculations for these test lives to determine whether GRS accurately projected benefits and whether the costs and liabilities were determined in accordance with their stated methods and assumptions.

Due to the limited amount of information provided by GRS, we were unable to review all details of the programming and possible scenarios. However, the information was sufficient for us to provide the following observations and recommendations, grouped by specific System. In general, our suggestions are minor and we do not expect that any resulting change in liabilities would be material, either individually or in the aggregate. Therefore, we recommend that GRS consider incorporating these changes into their next valuation.

All Systems

The normal cost and actuarial accrued liability calculations are consistent with our understanding of the Entry Age Normal method

South Carolina Retirement System (SCRS)

1. Employee contributions and benefit amounts were valued correctly based on our understanding of the applicable System provisions with two exceptions:

   $ According to the SCRS Member Handbook, Class Three members who die as active members are required to have eight years of earned service credit and either 15 years of total service credit or be at least 60 years of age in order for their designated beneficiary to receive a monthly annuity. GRS's programming uses five years of earned service credit in order to determine eligibility. Making this change would reduce overall liabilities.

   $ For members assumed to withdraw from employment before eligibility for service retirement and elect a deferred annuity, GRS programming assumes there is no liability for deaths before commencement of that deferred annuity, although we believe that the member's accumulated employee contributions plus interest would be payable to the participant's beneficiary or estate in such a scenario. Making this change would increase overall liabilities.

2. Decrement rates, salary scale rates and other assumptions were generally consistent with those documented in the reports and with the assumption tables supplied by GRS. Some minor exceptions were noted in our review. We recommend the following updates or enhancements to the report:

   ✳ Active members who have entered TERI are assumed to remain in the program for the maximum possible duration of five years. This assumption should be disclosed in the valuation report.

> ✴ Liabilities for active members who have entered TERI are valued as if they have already retired as of the valuation date, then multiplied by a factor of 0.975 to account for the average duration between the valuation date and the payment of benefits. This assumption should be disclosed in the valuation report.
>
> ✴ The report should be edited to clarify that retirement rates for Class Three members who achieve the "Rule of 90" do not apply if the "Rule of 90" is achieved after reaching age 65 with 8 years of service.

3. The 100% popup reduction factors used by GRS to value the spousal annuity benefit for active members who die before retirement are based on a different set of actuarial assumptions than the reduction factors actually used in the administration of the Plan.

> $ Applying the option factors actually used to administer the Plan would be the most accurate way for GRS to value this benefit. The factors currently used by GRS appear to overestimate the amount of the spousal annuity. Therefore, making this change would reduce overall liabilities.

4. The reduction factors used by PEBA to determine amounts payable under Option B and Option C are based on different mortality assumptions than GRS's valuation mortality assumptions. Therefore, the various optional forms of payment are not truly actuarially equivalent on a valuation basis. However, GRS assumes that all optional forms are actuarially equivalent in its program.

> $ GRS should consider incorporating a form of payment assumption to estimate the proportion of future retirees that will elect Option A, Option B and Option C, and use the Plan's actual option factors to value those benefits. We expect that this change would decrease overall liabilities because the actual reduction factors for Option B and Option C are based on a mortality assumption that predicts shorter lifespans (and, thus, greater benefit reductions) than the valuation assumption.

Police Officers' Retirement System (PORS)

1. Employee contributions and benefit amounts were valued correctly based on our understanding of the applicable System provisions with one exception:

> $ For members assumed to withdraw from employment before eligibility for service retirement and elect a deferred annuity, GRS programming assumes there is no liability for deaths before commencement of that deferred annuity, although we believe that the member's accumulated employee contributions plus interest would be payable to the participant's beneficiary or estate in such a scenario. Making this change would increase overall liabilities.

2. Decrement rates, salary scale rates and other assumptions were consistent with those documented in the reports and with the assumption tables supplied by GRS.

3. The 100% popup reduction factors used by GRS to value the spousal annuity benefit for active members who die before retirement are based on a different set of actuarial assumptions than the reduction factors actually used in the administration of the Plan.

> **$** Applying the option factors actually used to administer the Plan would be the most accurate way for GRS to value this benefit. The factors currently used by GRS appear to overestimate the amount of the spousal annuity. Therefore, making this change would reduce overall liabilities.

4. The reduction factors used by PEBA to determine amounts payable under Option B and Option C are based on different mortality assumptions than GRS's valuation mortality assumptions. Therefore, the various optional forms of payment are not truly actuarially equivalent on a valuation basis. However, GRS assumes that all optional forms are actuarially equivalent in its program.

> **$** GRS should consider incorporating a form of payment assumption to estimate the proportion of future retirees that will elect Option A, Option B and Option C, and use the Plan's actual option factors to value those benefits. We expect that this change would decrease overall liabilities because the actual reduction factors for Option B and Option C are based on a mortality assumption that predicts shorter lifespans (and, thus, greater benefit reductions) than the valuation assumption.

Retirement System for Judges and Solicitors (JSRS)

1. Employee contributions and benefit amounts were valued correctly based on our understanding of the applicable System provisions.

2. Decrement rates, salary scale rates and other assumptions were consistent with those documented in the reports and with the assumption tables supplied by GRS.

Retirement System for Members of General Assembly (GARS)

1. Employee contributions and benefit amounts were valued correctly based on our understanding of the applicable System provisions.

2. Decrement rates, salary scale rates and other assumptions were consistent with those documented in the reports and with the assumption tables supplied by GRS.

South Carolina National Guard (SCNG)

1. Employee contributions and benefit amounts were valued correctly based on our understanding of the applicable System provisions.

2. Decrement ratesand other assumptions were generally consistent with those documented in the reports and with the assumption tables supplied by GRS. Some minor exceptions were noted in our review. We recommend the following updates or enhancements to the report:

   ✳ The retirement rate for members older than age 59 with between 20 and 24 years of service should read 100% rather than 10%.

   ✳ GRS assumes that members who reach age 60 with less than 20 years of service will retire at that time and will not receive benefits from the plan. This assumption should be disclosed in the valuation report.

Review of Valuation Reports

While the accuracy of the actuarial valuation is the primary focus of an actuarial review, the content and presentation of the actuarial valuation results to a layperson and professional are also important. The actuarial valuation reports are comprehensive and contain a summary of the data, the actuarial funding results, development of the actuarial value of assets, and a reconciliation of the unfunded actuarial accrued liability (including gains and losses by source). Overall, the valuation reports communicate results with clarity, are complete, and follow the required actuarial standards of practice for actuarial communications.

We offer the following recommendations for adding useful information or improving the clarity of the reports:

1. The text associated with the tables is helpful in understanding the actuary's assumptions, methods, and calculations. However, the report places all of the explanatory discussions in one section and all of the tables in another section. The actuary may consider reformatting the reports so that the explanatory text appears next to the appropriate table or tables.

2. In the Executive Summary, the actuary should consider adding stronger language about the sufficiency of the employer and member contribution rates, given that they have increased for two years in a row to maintain a 30-year funding period.

3. Table of Contents – An expanded table of contents would be useful to the reader. The actuary should consider including the tables from Sections C and D in the Table of Contents.

4. The Minimum Required Contribution Rates, Funded Ratio, and Funding Period are displayed on an Actuarial Value of Assets basis. It may be informative to show these amounts on a Market Value of Assets basis to illustrate the effect of the asset smoothing method on measures of plan funding. For SCRS, the market value of assets is $3.3 billion lower than the actuarial value of assets and, as a result, actuarial losses are expected to be recognized in upcoming years unless there are offsetting future investment gains.

5. Development of the Actuarial Value of Assets – The difference between the actual return and the expected return is labeled "Excess Return". The label could be misleading and we recommend it be changed.

6. The word "principle" is frequently used in all five reports, when "principal" is meant. That is, the valuations should refer to the "principal assumptions and methods," the "principal financial measurements" and the "principal funding objectives."

7. Estimation of Yields – There are many methods for determining asset yields. A brief description of the methodology used to determine the market value and actuarial value yield would be useful.

8. The actuary recommended decreasing the discount rate to 7.00% or 7.25% (recognizing 25 basis points for alpha) in the 2016 Experience Investigation Study for the Period Ending June 30, 2015. The prescribed discount rate is 7.50%. The actuary should consider whether additional disclosure about the difference between the recommended discount rate and the

prescribed discount rate is warranted. The actuary and PEBA should consider whether it is appropriate to disclose the calculations based upon the recommended discount rate.

9. An increasing funded ratio is one of the objectives of the funding policy for all three Systems.

> ✺ We recommend including a projection of the funded ratio in the annual valuation reports to ensure that this goal is met.

Review of Assumptions and Methods

As part of our analysis, we reviewed the assumptions and methods recommended by GRS in connection with the 2016 Experience Investigation Study and used in the actuarial valuation reports as of July 1, 2016. As a comparison for select assumptions, we used a survey of 160 systems covering state and local employees, the Public Plans Data (PPD). The PPD is produced by the Center for Retirement Research at Boston College in partnership with the Center for State and Local Government Excellence and the National Association of State Retirement Administrators (NASRA).

Economic Assumptions

Economic assumptions have a significant effect on the development of System liabilities. Changes to these assumptions can substantially alter the results determined by the actuary. The goal is to have a consistent set of economic assumptions that appropriately reflect expected future economic trends.

The primary economic assumptions that affect the System's funding are:

> Inflation

> Investment rate of return (or discount rate)

> Individual salary increase rates

> Payroll growth rate

> Administrative expenses

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides guidance in developing economic assumptions, and a key feature of this publication is the "building block" approach.

The "building block" approach uses the actuary's best estimate for the key components of economic assumptions: inflation, the risk free rate of return, and the expected return premium (or risk premium) for each asset class. The actuary begins with a reasonable range for each component, then selects a specific point within the range based on historical data, System specific data and the expectation concerning future economic environment. While ASOP No. 27 no longer includes a "best estimate range," the concept remains useful in approaching assumption setting.

Inflation

Actuarial standards of practice suggest the actuary review appropriate inflation data in developing the assumed inflation component. This data may include consumer price indexes, the implicit price deflator, forecasts of inflation, and yields on government securities of various maturities. In its analysis, GRS recommended lowering the inflation assumption to 2.25%, which we believe is reasonable.

Investment Return

The investment return assumption is used as the discount rate to determine the present value of expected future benefits. The current assumption is 7.50%, which is 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. The 7.50% investment return rate is comprised of a 4.75% real rate of return (net of investment and administrative expenses), in addition to a 2.75% inflation assumption.

GRS studied the capital market assumptions provided by the investment consultant, Aon, as well as those included in the Horizon Actuarial Services 2015 Survey, which compiled and averaged the return and risk forecasts of 29 major investment consulting firms, including Aon. The GRS analysis showed that the 50th percentile 20-year average nominal return assumption is 7.25%. GRS recommended an investment return assumption of 7.25%, comprised of a 5% real rate of return (net of investment expenses only) and the recommended underlying inflation assumption of 2.25%. The 7.25% recommended assumption includes 25 basis points for the portable alpha investment strategy. GRS recommends a 7.00% investment if the decision makers do not want to advance recognize the potential additional returns attributable to this investment strategy.

The following is an excerpt from ASOP No. 27 that provides guidance on setting the investment return assumption. This ASOP was adopted in September 2013 and is applicable for actuarial valuations with measurement dates on or after September 30, 2014.

From the Actuarial Standard of Practice (ASOP) No. 27:

The investment return assumption reflects the anticipated returns on the plan's current and, if appropriate for the measurement, future assets. This assumption is typically constructed by considering various factors including, but not limited to, the time value of money; inflation and inflation risk; illiquidity; credit risk; macroeconomic conditions; and growth in earnings, dividends, and rents.
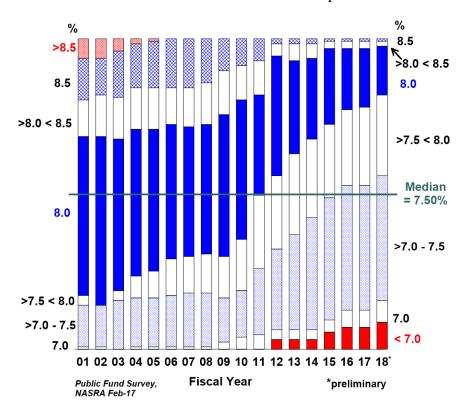
In developing a reasonable assumption for these factors and in combining the factors to develop the investment return assumption, the actuary may consider a broad range of data and other inputs, including the judgment of investment professionals.

*3.8.1   **Data**   The actuary should review appropriate investment data. These data may include the following:*

a.   current yields to maturity of fixed income securities such as government securities and corporate bonds;

b.   forecasts of inflation, GDP growth, and total returns for each asset class;

c.   historical and current investment data including, but not limited to, real and nominal returns, the inflation and inflation risk components implicit in the yield of inflation-protected securities, dividend yields, earnings yields, and real estate capitalization rates; and

d.   historical plan performance.

The actuary may also consider historical and current statistical data showing standard deviations, correlations, and other statistical measures related to historical or future

expected returns of each asset class and of inflation. Stochastic simulation models or other analyses may be used to develop expected investment returns from this statistical data.

The prescribed 7.50% assumption is equal to the median investment return assumption of 7.50%, as shown in the February 2017 Public Fund Survey. The survey is based upon reported data, which does not always reflect the latest information. The trend is to lower the investment return assumption, particularly given the outlook for a low inflation environment. We concur with the GRS recommendation to lower the investment return assumption to 7.00% or 7.25%.

Public Fund Survey, NASRA Feb-17
Fiscal Year
*preliminary

Individual Salary Increases

The individual salary increase assumption is used to determine participants' projected benefits provided by the System. Generally, a participant's salary will change over their career in accordance with inflation, productivity growth, and merit increases. The actuary should review available compensation data when selecting this assumption, including: employers' current compensation practices and any anticipated changes; historical compensation increases and practices of the employers and other employers in the same industry or geographic area; and historical national wage and productivity increases.

The best estimate salary scale is generally constructed using the "building block" approach recommended in ASOP 27, which combines best-estimate ranges for the components of salary scale: inflation, productivity, and merit. The inflation and productivity components are combined to produce the assumed rate of wage inflation. This rate represents the "across the board" average annual increase in salaries shown in the experience data. The merit component includes the additional increases in salary due to performance, seniority, promotions, etc.

✴ Segal Consulting   25

GRS studied the salary increase assumption for each plan. The salary increase assumption was adjusted to lower the inflation component to the recommended 2.25% inflation assumption. No changes were made to the productivity component. The merit component was increased for the General Employees and PORS to reflect experience. The overall effect results in slightly lower assumed rates of increase for all employee groups. All members of JSRS receive the same percentage of increase in their salary. GRS recommended a 0.25% decrease from the current assumption.

We agree with the GRS analysis.

Payroll Growth

The payroll growth assumption represents the expected annual increase in total covered payroll from one year to the next. This assumption is used to determine the annual payment needed to amortize unfunded actuarial accrued liability, which is calculated as a level percentage of payroll. To the extent that actual payroll increases were less than the assumption, fewer dollars have gone toward paying off the unfunded liability than anticipated and future amortization payments will be larger (the converse is also true). The payroll growth assumption is used for SCRS and PORS.

GRS recommended lowering the payroll growth assumption from 3.50% to 3.00%, which is consistent with the 0.50% decrease in the recommended inflation assumption. We believe this recommendation is reasonable.

Administrative Expenses

Segal agrees with GRS's recommendation to add an explicit assumption for administrative expenses, as a load to normal cost. As noted in the experience study, this lessens the burden on the investments to generate sufficient returns to cover both investment and administrative expenses, and is also consistent with the requirements of the recently updated accounting standards.

Demographic Assumptions

The demographic assumptions used to value the Systems reflect the expected occurrence of various events among participants. The assumptions should reflect specific characteristics of the Systems and produce reasonable results. A reasonable assumption is one that is expected to model the contingency being measured and not expected to produce significant gains and losses. The types of demographic assumptions used to measure pension obligations include, but are not limited to the following:

> Mortality

> Retirement

> Termination of employment (withdrawal)

> Disability

> Others, including percentage married, and spousal age difference.

Actuarial Standard of Practice (ASOP) No. 35, *Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*, provides guidance in developing

demographic assumptions. The standard recommends that the actuary follow a general process for selecting demographic assumptions. The first step of this general process is to identify the types of assumptions to use. The actuary should consider relevant System provisions that will affect timing and value of any potential benefit payments, all contingencies that give rise to benefits or loss of benefits, and the characteristics of the covered group. The next step in the process is to identify the relevant assumption universe. The assumption universe may include prior experience studies or general studies of trends relevant to the specific type of demographic assumption and System experience to the extent that it is credible. The third step in the process is to consider the assumption format. The format may include different tables for different segments of the covered population (such as different turnover rates for municipal employees versus public safety). The final step in the process is to select assumptions and evaluate the reasonableness of each assumption. The specific experience of the Systems should be incorporated but not given undue weight if recent experience is attributable to a phenomenon that is unlikely to continue. For example, if recent rates of termination were due to a one-time reduction in workforce it may be unreasonable to assume that such rates will continue.

Mortality

GRS recommended replacing the base mortality tables, which were 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 insufficient experience to develop a specific mortality assumption for disabled retirees and active members, GRS recommended using variations of the RP-2014 mortality tables for these members. GRS recommended continued use of the generational mortality improvement assumption Scale AA to explicitly project future improvement in mortality for non-disabled and disabled retirees.

The following is an excerpt from ASOP No. 35 that provides guidance on setting the mortality assumption. This ASOP was modified in September 2010 and is applicable for actuarial valuations with measurement dates on or after June 30, 2011.

From the Actuarial Standard of Practice (ASOP) No. 35:

3.5.3 *Mortality and Mortality Improvement Assumptions* *The actuary should consider the effect of mortality improvement both prior to and subsequent to the measurement date. With regard to mortality improvement, the actuary should do the following:*

i. *adjust mortality rates to reflect mortality improvement prior to the measurement date. For example, if the actuary starts with a published mortality table, the mortality rates may need to be adjusted to reflect mortality improvement from the effective date of the table to the measurement date. Such an adjustment is not necessary if, in the actuary's professional judgment, the published mortality table reflects expected mortality rates as of the measurement date.*

ii. *include an assumption as to expected mortality improvement after the measurement date. This assumption should be disclosed in accordance with section 4.1.1, even if the actuary concludes that an assumption of zero future improvement is reasonable as described in section 3.1. Note that the existence of uncertainty about the occurrence or magnitude of future mortality improvement does not by itself mean that an assumption of zero future improvement is a reasonable assumption.*

The approach used by GRS complies with the Actuarial Standards of Practice. We note that on page 33 of the 2016 Actuarial Experience Study, GRS utilizes a benefits weighted approach for the mortality study. This methodology directly takes into consideration the correlation, if any, between their benefit size and the health of the annuitants. We concur with this method.

Since the release of the Scale AA, additional mortality improvement projection scales have been released. A mortality study based on public sector plan experience is expected to be released in the near future. GRS performed extensive reviews of the improvement in mortality for the System in the period 2005 to 2015 and as a result of those studies recommended continued use of Scale AA. In our opinion, this is appropriate for current valuation purposes based on their studies. Please note that Scale AA has been the subject of some criticism regarding its use (e.g. not enough predicted improvement and use for disability retirements). When the public sector mortality study is completed, we suggest that it be thoroughly reviewed for compatibility with the System's experience.

Retirement Rates

For General Employees, Public School Employees, and PORS, GRS uses retirement rates that vary by age, gender, service, reduced versus unreduced, and first eligibility versus after first eligibility. Different retirement rates apply to Class Two and Class Three. Because of changes in benefit structure and the implementation of Class Three, not all prior experience was a good indicator for future expectations. The retirement rates were adjusted for Class Two members based upon the prior experience that was credible. Class Three retirement rates remain unchanged as there is no experience for these members.

There were no changes in benefits for JSRS, GARS, or SCNG and the retirement rates were adjusted to reflect experience and future expectation. Members hired after June 30, 2012 in SCRS and PORS have different retirement eligibilities and benefits.

The approach GRS took is reasonable and consistent with Segal's experience with other systems.

Other Comments

The recommendations that GRS made with respect to the termination and disability rates were consistent with the experience and in our opinion reasonable.

Actuarial Methods

Funding Method

The funding method employed is the entry age normal (EAN) actuarial cost method and is the same method used by more than three-quarters of the Systems in the Public Funds Survey. We find the current method to be reasonable.

Asset Valuation Method

The actuarial asset method was changed to a five-year smoothing method that determines the investment gain or loss on the market value of assets, and recognizes this amount at the rate of 20% per year. The asset method was to be applied on a prospective basis. We note that July 1, 2016 actuarial valuation used an actuarial value of assets that smoothed the last two years of investment losses, which is a deviation from the recommendation in the experience study. The method does not impose a corridor, which would place a limit on the spread between the actuarial value of assets (AVA) and the market value of assets (MVA). However, the methodology used by the Systems will generate an actuarial value that converges to market value if the Systems' assets earn the assumed rate of return. It also does so within a reasonable period of time. The absence of a corridor is not uncommon for retirement plans in the public sector.

An essential part of the public sector budgeting process is that material budget items, including pension contributions, should have a level cost pattern from year to year to the extent possible. Segal recognizes the importance of this requirement and assists clients in establishing reasonable methodologies for recognizing investment gains and losses and limiting the potential volatility that may result in increased contributions due to investment results.

The actuary's guide for determining the reasonableness of an asset smoothing method is ASOP No. 44. The following is an excerpt from this ASOP that establishes the qualities a reasonable asset smoothing method must exhibit.

From the Actuarial Standard of Practice (ASOP) No. 44:

3.3   *Selecting Methods Other Than Market Value*   *If the considerations in Section 3.2 have led the actuary to conclude that an asset valuation method other than market value may be appropriate, the actuary should select an asset valuation method that is designed to produce actuarial values of assets that bear a reasonable relationship to the corresponding market values. The qualities of such an asset valuation method include the following:*

a.   The asset valuation method is likely to produce actuarial values of assets that are sometimes greater than and sometimes less than the corresponding market values.

b.   The asset valuation method is likely to produce actuarial values of assets that, in the actuary's professional judgment, satisfy both of the following:

1.   The asset values fall within a reasonable range around the corresponding market values. For example, there might be a corridor centered at market value, outside of which the actuarial value of assets may not fall, in order to assure that the difference from market value is not greater than the actuary deems reasonable.

2.   *Any differences between the actuarial value of assets and the market value are recognized within a reasonable period of time. For example, the actuary might use a method where the actuarial value of assets converges toward market value at a pace that the actuary deems reasonable, if the investment return assumption is realized in future periods.*

In lieu of satisfying both (1) and (2) above, an asset valuation method could satisfy section 3.3(b) if, in the actuary's professional judgment, the asset valuation method either (i) produces values within a sufficiently narrow range around market value or (ii) recognizes differences from market value in a sufficiently short period.

Two key principles arise from ASOP No. 44. First, an acceptable asset smoothing approach must create asset values that fall within a reasonable range around market value, and second, that gains and losses are recognized in a reasonable period of time. In lieu of satisfying both of these principles, a smoothing method could satisfy the requirements if, in the actuary's professional judgment, the range around market value is sufficiently narrow or the differences are recognized in a sufficiently short period.

Segal has established an internal policy, which is consistent with others in the actuarial community, that five years is a sufficiently short period to constitute a reasonable asset smoothing method even if no corridor is used. Therefore, it is our opinion that the method used by the Systems is reasonable.

Unfunded Actuarial Accrued Liability (UAAL) Amortization Method

The five systems use various amortization alternatives as shown in the table below. Each valuation is performed annually as of July 1 for the budget year beginning July 1 two years later. As of July 1, 2016, amortization for SCRS, PORS and JSRS was developed using continuous interest and discrete payroll increases over 30 years with payroll increasing 3% per year. GARS and SCNG both use level dollar amortization. The amortization period is 9 years for GARS. For SCNG, the amortization period is 5 years on the 2006 original base and 20 years for the remaining UAAL. Amortization payments are assumed to be made at the beginning of the year for GARS and at the end of the year for SCNG.

Just a few notes on these amortization alternatives:

Continuous amortization is rarely used in practice but is a methodology all actuaries learned at some point. Without some explanation and research, a reader of the report will not immediately grasp what method is in use. Often when employer contributions are received on a monthly basis, interest on the amortization of the UAAL will be adjusted for the monthly nature of contributions or, alternatively, an assumption that all contributions are paid mid-year will be made. In our opinion, either of these alternatives would be more transparent for users of the report.

The valuations we reviewed for SCRS, PORS and JSRS used a 30-year amortization period with payments as a level percentage of payroll. Under this method, the UAAL will increase before any unfunded begins to be paid off. In other words, amortization payments are not sufficient to cover the interest on the UAAL until sometime in the future. We understand that the contribution rate may not be reduced until the individual system has attained a 90% funding ratio. Furthermore, H3726 is intended to reduce the maximum amortization period by one in each future year. We

recommend that projections be prepared that show the expected future UAAL's and the percentage funded to gauge how well the methodology, including the limits and future changes, is performing.

PEBA staff indicated that the JSRS employer contribution is paid at the beginning of the fiscal year. We suggest that the amortization method for JSRS be modified to reflect this.

PEBA staff indicated that GARS and SCNG contributions are both paid at the beginning of the fiscal year. The GARS amortization method is consistent with this approach. We suggest that the SCNG amortization method be modified to reflect this payment pattern, as well.

Plan	Period	Method	Tiers	Valuation Timing	Employer Payments*
SCRS	30	Level percent of pay	No	Continuous	Monthly
PORS	30	Level percent of pay	No	Continuous	Monthly
JSRS	30	Level percent of pay	No	Continuous	Beginning of Year
GARS	9	Level dollar	No	Beginning of Year	Beginning of Year
SCNG	5/20	Level dollar	Yes	End of Year	Beginning of Year

* Information received from PEBA.