GRS Retirement Consulting

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February 9, 2018

Ms. Peggy G. Boykin, CPA
Executive Director
South Carolina Public Employee Benefit Authority
202 Arbor Lake Drive
Columbia, SC 29223

Re: Actuarial Analysis of Closing SCRS to New Members on July 1, 2018

Dear Peggy:

The purpose of this letter is to provide the projected fiscal impact if there was legislation that closed the South Carolina Retirement System (SCRS) to new members on and after July 1, 2018 and that all new members would earn retirement benefits that are currently provided by the State Optional Retirement Plan (ORP).

Summary of Cost Impact

There are two items that result in a net increase in the fiscal cost if SCRS is closed to new members and all members earn retirement benefits in the ORP: (1) the difference in normal cost rate (cost of new benefit accruals in SCRS) the and the 5.00% employer contribution to the ORP, and (2) the opportunity cost as the investment policy changes and actual returns on those investments will decrease in future years. In summary, we determine the net present value of employer contribution requirements will increase by $4.4 billion, from $35.7 billion to $40.1 billion due to the plan change.

On the other hand, while there will be an increase in the employer cost, there will also be a shift in the investment and longevity risk from the employers and State to the members and retirees with respect to the benefits provided in the ORP.

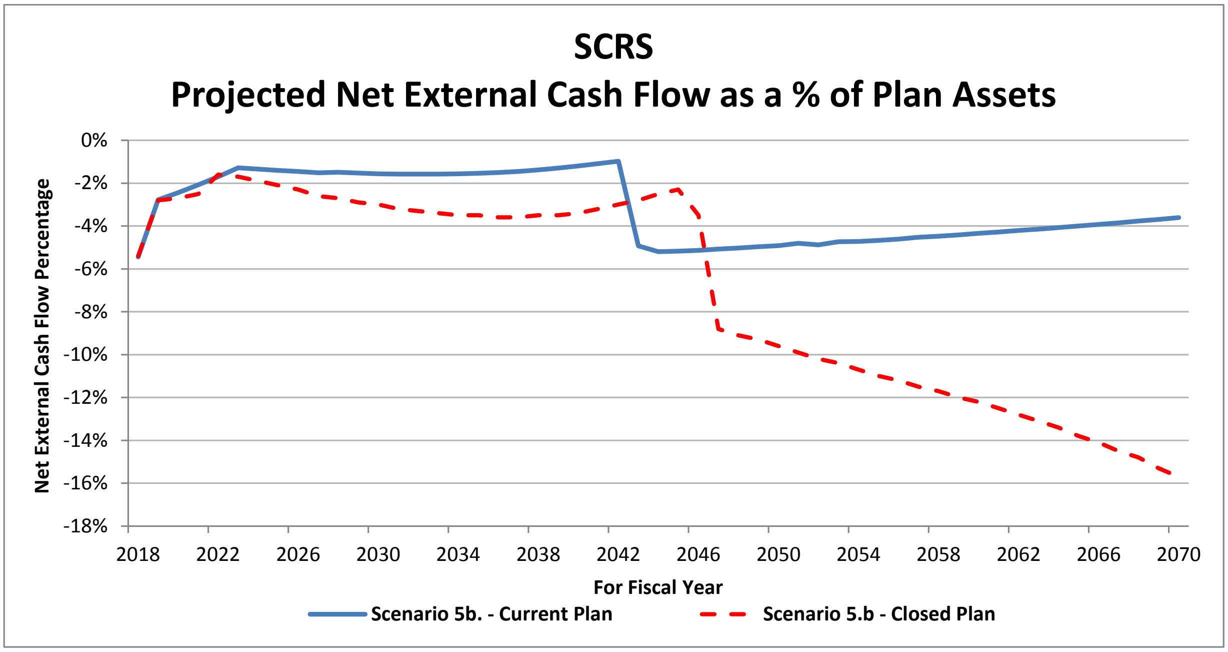
<u>Cost of the ORP Benefit versus the Employer Normal Cost Rate in SCRS</u>

Currently, employers contribute the same contribution rate on the payroll of members in SCRS and the ORP. For FY 2017/2018, the employer contribution rate is 13.56% of pay. For SCRS, 1.72% (10.72% total normal cost rate less a 9.00% member contribution rate) of this contribution rate is to finance the benefits earned by active members and the remaining 11.84% of pay (13.56% total contribution rate less 1.72% employer normal cost rate) is used to finance the unfunded actuarial accrued liability. In the case of the ORP, the first 5.00% of the employer contribution rate is directed to the member's account balance, and the remaining amount 8.56% (13.56% total ORP Contribution less the 5.00% members benefit) is directed to SCRS to finance the unfunded actuarial accrued liability. As a result, the cost of providing retirement benefits in the ORP is greater than the employer's cost to provide benefits in SCRS for a new hire.

However, if the assumed rate of return is decreased to 6.00% for reasons discussed in the following section, then the employer normal cost rate in SCRS will increase to approximately 4.80% pay, which is relatively close to the 5.00% of pay ORP cost.

Opportunity Cost Associated with a Required Change in Investment Policy

As the difference between the benefit payments and the contributions received by SCRS increase over time, it is likely the investment commission will need to modify the investment policy to provide increased liquidity as the percentage of plan assets. To illustrate this, the chart below shows the projected net cash flow (i.e. total employer and member contributions minus benefit payments) as a percentage of the beginning of the fiscal year value of assets for the both the current plan and if SCRS is closed to new members.



As the graph shows, the net cash flow is expected to remain between 0% and -4% during the years where employers and members are projected to be contributing to finance the current unfunded liability. During this period, the contributions and investment earnings are expected to provide sufficient liquidity for providing the benefit payments.

However, after the current UAAL has been fully amortized and the employer and members are no longer contributing to SCRS, there will be a significant increase in the asset liquidity needs because a greater portion of benefits will be provided by dispersing plan assets. As the projection shows, the net external cash flow as a percentage of plan assets is projected to jump to approximately 9% beginning with the 2045/2046 fiscal year. This trend continues to accelerate in future years as the fund matures and the membership demographics comprises almost entirely of retirees receiving pension benefits.

To manage this cash flow requirement, the investment policy will need to diverse out of higher earning and less volatile, illiquid investments such as private equity, hedge funds, and direct real estate, and into publicly traded investments that are expected to provide either lower investment earnings at the same level of volatility or other investments that provide the same expected investment return but at the cost of greater volatility.

If the benefits to current members remain unchanged, and if the change in investment policy is anticipated to result in lower future investment earnings, then the employer contributions would have to increase to offset the decrease in earnings. Based on guidance provided by PEBA and the investment commission, we have modeled this effect by decreasing the assumed rate to 6.00% in the year 2021. This is the year the current investment return assumption in the State Code will sunset and requires a new recommend investment return assumption from PEBA and the investment commission. While the portfolio may not have to materially change over the next 10-20 years and an expected 7% return is possible throughout that period, the returns after 2045 would likely be much less than even 6.00% based on the likely portfolio construction at that time. The 6.00% represents an average blended rate of the time when the portfolio may be expected to produce returns higher than 6% over the short to intermediate terms and returns less than 6.00% over the longer term.

Cost Projections

Attached are two cost projections. The first projection is an updated version of Scenario 5.b. that was used as a basis by the Joint Committee on Pensions to develop the funding reform legislation enacted during the 2017 legislative session. This projection assumes that the investment return assumption will be decreased from 7.25% to 7.00% in 2021, when the current investment return assumption will sunset. This projection also assumes the emerging investment experience will be 4.00% per year for the next four years and 7.00% per year each year thereafter (i.e. the same as the investment return assumption after the next four years).

The second projection, assumes SCRS will be closed to new members after July 1, 2018 and that the assumed investment return will be decreased from 7.25% to 6.00% in the year 2022 to reflect the change in investment policy that is required as a result of the plan change. Similarly, this projection assumes the emerging investment experience will be 4.00% per year for the next four years and 6.00% per year each year thereafter (i.e. the same as the investment return assumption after the next four years). Under this scenario, the currently scheduled contribution rates will not be sufficient to maintain a funding period that is less than the maximum permitted under State Code. As a result, the employer contribution rate will be required to increase to 19.17% in FY 2021/2022 and again during the next several years until reaching an ultimate contribution rate of 19.61% in FY 2025/2026 which will be maintained for the next 20 years, until the June 30, 2045.

Based on these scenarios, over the next 30 years, the present value of the employer contributions (employer contributions to SCRS and the ORP) will increase by $4.4 billion, from $35.7 billion to $40.1 billion due to the plan change. Note, it is inappropriate to separately identify the cost impact due to closing SCRS and reducing the assumed rate of return to 6.00%. The cost impact due to these effects must be considered together as the plan change requires a change in the investment policy (and thus the investment return assumption).

It is important to realize that while the increase in costs appears to be driven by the change in the assumed rate of return, meaning this could be solved by just not decreasing the assumed rate of return, this increase in employer cost is instead driven entirely by the decrease in *actual* returns. Certain combinations of portfolio construction, investment policies, and cash flow needs produce less actual returns over time than others. Even if the assumed rate of return were not decreased in 2021 in anticipation of a future likely change in the portfolio, and thus not increasing employer costs over the short term, once the lower earnings began to be realized, it would push employer contributions even higher over the longer term, producing an increase in total employer contributions even bigger than the $4.4 billion above.

Again, it is not the assumed rate of return that drives costs over the longer term, it is the actual earnings that are generated. If the same benefit is provided to a group of people and there are less actual dollars of earnings available to assist in paying the benefits, then the contributions at some point have to increase to make up the difference.

Basis of Calculations

For purposes of this analysis, we have assumed that the current funding requirements specified in Section 9-1-1085 of South Carolina Code will remain unchanged. We also assumed that SCRS would continue to receive employer contributions on the payroll of members earning retirement benefits in the ORP on the contribution rate in excess of 5.00% of pay.

GRS based the calculations and analysis in this letter on the member and financial data provided by PEBA and used to perform the actuarial valuation as of June 30, 2017. Except where noted otherwise, the projections assume the employers will maintain a constant workforce (i.e. the total number of active employees, working retirees, and members earning benefits in the ORP) each future year and that as current active members terminate or retirement from a covered position in the retirement system, they would be replaced by a new employee.

Our calculations are based upon assumptions regarding future events, which may or may not materialize. Depending on actual plan experience, actual results could deviate significantly from our projections.

General Comments

We are not attorneys, and we cannot provide a legal opinion regarding the changes in this proposed legislation. Nothing in this letter should be construed as providing legal, investment or tax advice. It may be prudent to consult with the Retirement System's counsel before enacting any such changes. Finally, no statement in this letter is intended to be interpreted as a recommendation in favor of or in opposition to the changes studied herein.

Mr. White and Mr. Newton are Enrolled Actuaries. All of the undersigned are also members of the American Academy of Actuaries and we meet all of the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. In addition, all of the undersigned are experienced in performing valuations for large public retirement systems. If you have any questions, or require any additional or clarifying information, please do not hesitate to contact us.

Sincerely,

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

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

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Enclosures

South Carolina Retirement System (SCRS)
SCRS Exhibit 5b. - Current Plan
Projection Based on July 1, 2017 Actuarial Valuation
Investment Return Assumption is 7.25% for 2017 Through 2020, and 7.00% for 2021 and Thereafter
Assumes Emerging Investment Experience is 4.00% Per Year for FY 2018 - 2021 and 7.00% Each Year Thereafter

($ in Millions)

	Contribution Rate		Actuarial Accrued	Actuarial Value of	Unfunded	Funded Ratio	Calculated Funding	Interest on Unfunded Liability	Amortization	Positive/(Negative) Interest Payment	Employer Contributions		
July 1,	Employer	Member	Liability	Assets	Liability	AVA / AAL	Period (years)	Column 6 x Int Rate	Payment	Column 10 - Column 9	SCRS	ORP	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2017	13.56%	9.00%	$ 48,375	$ 27,242	$ 21,133	56%	24	$ 1,532	$ 1,274	$ (258)	$ 1,422	$ 73	$ 1,495
2018	14.56%	9.00%	49,012	26,726	22,286	55%	22	1,616	1,415	(201)	1,567	87	1,654
2019	15.56%	9.00%	50,317	26,742	23,575	53%	21	1,709	1,572	(137)	1,724	96	1,820
2020	16.56%	9.00%	51,633	27,249	24,384	53%	19	1,768	1,738	(30)	1,890	105	1,995
2021	17.56%	9.00%	54,345	28,111	26,234	52%	19	1,836	1,858	22	2,064	115	2,179
2022	18.56%	9.00%	55,728	28,831	26,897	52%	19	1,883	2,039	156	2,246	126	2,372
2023	18.56%	9.00%	57,120	29,904	27,216	52%	18	1,905	2,097	192	2,305	138	2,443
2024	18.56%	9.00%	58,516	31,212	27,304	53%	18	1,911	2,156	245	2,366	151	2,517
2025	18.56%	9.00%	59,908	32,754	27,154	55%	17	1,901	2,217	316	2,428	164	2,592
2026	18.56%	9.00%	61,295	34,538	26,757	56%	16	1,873	2,278	405	2,491	179	2,670
2027	18.56%	9.00%	62,670	36,398	26,272	58%	15	1,839	2,345	506	2,557	193	2,750
2028	18.56%	9.00%	64,060	38,373	25,687	60%	14	1,798	2,412	614	2,625	208	2,833
2029	18.56%	9.00%	65,427	40,437	24,990	62%	13	1,749	2,481	732	2,694	224	2,918
2030	18.56%	9.00%	66,772	42,600	24,172	64%	12	1,692	2,551	859	2,765	241	3,006
2031	18.56%	9.00%	68,095	44,871	23,224	66%	11	1,626	2,624	998	2,838	258	3,096
2032	18.56%	9.00%	69,394	47,262	22,132	68%	10	1,549	2,698	1,149	2,912	276	3,188
2033	18.56%	9.00%	70,671	49,783	20,888	70%	9	1,462	2,775	1,313	2,989	295	3,284
2034	18.56%	9.00%	71,922	52,447	19,475	73%	8	1,363	2,854	1,491	3,068	315	3,383
2035	18.56%	9.00%	73,148	55,267	17,881	76%	7	1,252	2,935	1,683	3,149	335	3,484
2036	18.56%	9.00%	74,352	58,261	16,091	78%	6	1,126	3,016	1,890	3,232	356	3,588
2037	18.56%	9.00%	75,540	61,451	14,089	81%	5	986	3,102	2,116	3,318	378	3,696
2038	18.56%	9.00%	76,721	64,862	11,859	85%	4	830	3,191	2,361	3,407	401	3,808
2039	18.56%	9.00%	77,899	68,520	9,379	88%	3	657	3,281	2,624	3,497	424	3,921
2040	18.56%	9.00%	79,082	72,449	6,633	92%	2	464	3,374	2,910	3,591	448	4,039
2041	18.56%	9.00%	80,282	76,684	3,598	96%	1	252	3,470	3,218	3,687	473	4,160
2042	5.94%	5.94%	81,512	81,262	250	100%	0	18	259	241	872	498	1,370
2043	5.21%	5.21%	82,785	82,785	-	100%	N/A	N/A	N/A	N/A	715	525	1,240
2044	5.21%	5.21%	84,107	84,107	-	100%	N/A	N/A	N/A	N/A	723	552	1,275
2045	5.20%	5.20%	85,481	85,481	-	100%	N/A	N/A	N/A	N/A	731	581	1,312
2046	5.20%	5.20%	86,910	86,910	-	100%	N/A	N/A	N/A	N/A	750	601	1,351

Projection based on the July 1, 2017 actuarial valuation. This information is provided for stakeholders to understand the financial impact based on the illustrated assumptions and emerging investment experience for decision making purposes.

The proposed legislation would permit the Board to decrease the employer and member contribution rates in equal amount after the System attains an 85% funded ratio. For illustration purposes, the contribution rates decrease upon attainment of a 100% ratio and the total of the employer and member contribution rate will equal the total normal cost rate.

February 9, 2017

South Carolina Retirement System (SCRS)

SCRS Exhibit 5b. - Closed Plan and 6.00% Return Assumption

Projection Based on July 1, 2017 Actuarial Valuation

Investment Return Assumption is 7.25% for 2017 Through 2020, and 6.00% for 2021 and Thereafter

Assumes Emerging Investment Experience is 4.00% Per Year for FY 2018 - 2021 and 6.00% Each Year Thereafter

($ in Millions)

July 1,	Contribution Rate Employer	Member	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Liability	Funded Ratio AVA / AAL	Calculated Funding Period (years)	Interest on Unfunded Liability Column 6 x Int Rate	Amortization Payment	Positive/(Negative) Interest Payment Column 10 - Column 9	Employer Contributions SCRS	ORP	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2017	13.56%	9.00%	$ 48,375	$ 27,242	$ 21,133	56%	24	$ 1,532	$ 1,285	$ (247)	$ 1,422	$ 73	$ 1,495
2018	14.56%	9.00%	49,012	26,726	22,286	55%	23	1,616	1,426	(190)	1,567	87	1,654
2019	15.56%	9.00%	50,176	26,742	23,435	53%	21	1,699	1,562	(137)	1,695	126	1,821
2020	16.56%	9.00%	51,322	27,192	24,130	53%	20	1,749	1,709	(40)	1,833	162	1,995
2021	19.17%	9.00%	60,177	27,932	32,245	46%	26	1,935	1,798	(137)	2,180	199	2,379
2022	19.51%	9.00%	61,316	28,410	32,906	46%	25	1,974	1,893	(81)	2,258	235	2,493
2023	19.54%	9.00%	62,393	29,078	33,314	47%	24	1,999	1,952	(47)	2,300	272	2,572
2024	19.60%	9.00%	63,398	29,895	33,503	47%	23	2,010	2,017	7	2,348	310	2,658
2025	19.61%	9.00%	64,320	30,861	33,459	48%	22	2,008	2,076	68	2,390	348	2,738
2026	19.61%	9.00%	65,144	31,958	33,186	49%	21	1,991	2,135	144	2,434	387	2,821
2027	19.61%	9.00%	65,863	33,019	32,844	50%	20	1,971	2,199	228	2,482	423	2,905
2028	19.61%	9.00%	66,467	34,082	32,385	51%	19	1,943	2,265	322	2,533	460	2,993
2029	19.61%	9.00%	66,950	35,117	31,833	52%	18	1,910	2,333	423	2,585	498	3,083
2030	19.61%	9.00%	67,308	36,125	31,183	54%	17	1,871	2,401	530	2,639	536	3,175
2031	19.61%	9.00%	67,537	37,111	30,426	55%	16	1,826	2,473	647	2,695	575	3,270
2032	19.61%	9.00%	67,634	38,078	29,556	56%	15	1,773	2,545	772	2,753	615	3,368
2033	19.61%	9.00%	67,593	39,031	28,562	58%	14	1,714	2,620	906	2,813	657	3,470
2034	19.61%	9.00%	67,408	39,973	27,435	59%	13	1,646	2,697	1,051	2,875	699	3,574
2035	19.61%	9.00%	67,078	40,911	26,167	61%	11	1,570	2,776	1,206	2,939	741	3,680
2036	19.61%	9.00%	66,601	41,856	24,745	63%	10	1,485	2,858	1,373	3,007	784	3,791
2037	19.61%	9.00%	65,981	42,822	23,159	65%	9	1,390	2,941	1,551	3,077	828	3,905
2038	19.61%	9.00%	65,225	43,827	21,398	67%	8	1,284	3,027	1,743	3,150	871	4,021
2039	19.61%	9.00%	64,335	44,889	19,446	70%	7	1,167	3,116	1,949	3,227	916	4,143
2040	19.61%	9.00%	63,316	46,025	17,292	73%	6	1,037	3,207	2,170	3,306	960	4,266
2041	19.61%	9.00%	62,178	47,259	14,920	76%	5	895	3,302	2,407	3,390	1,005	4,395
2042	19.61%	9.00%	60,935	48,621	12,314	80%	4	739	3,398	2,659	3,477	1,049	4,526
2043	19.61%	9.00%	59,595	50,137	9,458	84%	3	567	3,499	2,932	3,569	1,094	4,663
2044	19.61%	9.00%	58,164	51,833	6,331	89%	2	380	3,605	3,225	3,663	1,139	4,802
2045	16.61%	7.05%	56,645	53,730	2,915	95%	1	175	2,958	2,783	3,004	1,185	4,189
2046	4.84%	4.84%	55,040	55,040	(0)	100%	N/A	N/A	N/A	N/A	26	1,233	1,259

Projection based on the July 1, 2017 actuarial valuation. This information is provided for stakeholders to understand the financial impact based on the illustrated assumptions and emerging investment experience for decision making purposes.

The proposed legislation would permit the Board to decrease the employer and member contribution rates in equal amount after the System attains an 85% funded ratio. For illustration purposes, the contribution rates decrease upon attainment of a 100% ratio and the total of the employer and member contribution rate will equal the total normal cost rate.

February 9, 2018