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March 26, 2014

To All Members of the 98th General Assembly:

Senate Bill 1 (P.A. 98-0599), which took effect on December 5th, 2013, made significant reforms to the funding and benefit provisions of the five State retirement systems. In response to numerous requests from legislators and staff, we asked our consulting actuary, Segal, to perform an independent cost study on the provisions of the Act. That cost study is attached herewith. As you will see in Segal's letter, total State contributions to the five State systems are expected to be reduced by approximately \$137.4 billion through FY 2045 (\$23.86 billion on a present value basis). The letter also addresses the relative impact of the switch from the Projected Unit Credit (PUC) cost method to the Entry Age Normal (EAN) cost method as of July 1, 2014.

The chart below provides a snapshot of the first-year reduction in accrued liabilities, the first-year (FY 2016) reduction in State contributions, and the cumulative reduction in State contributions through FY 2045. The chart incorporates Segal's SB 1 projections and the SB 1 projections generated by the State systems' actuaries.

	<u>Segal Total</u>	<u>Segal SERS</u>	<u>Segal SURS</u>	<u>Segal TRS</u>
<u>Reduction in Projections* (\$ in millions)</u>				
Reduction in FY 2014 Accrued Liabilities:	\$21,079.6	\$3,470.1	\$4,475.2	\$13,134.3
Reduction in FY 2016 State Contribution:	\$1,182.8	\$184.9	\$188.9	\$809.0
Reduction in FY 2016 - FY 2045 Cumulative Contributions:	\$137,410.1	\$29,918.6	\$28,993.8	\$78,497.7
*All projections based off of Segal's 2013 valuation for the systems				
	<u>System Total</u>	<u>System SERS</u>	<u>System SURS</u>	<u>System TRS</u>
<u>Reduction in Projections* (\$ in millions)</u>				
Reduction in FY 2014 Accrued Liabilities:	\$20,902.2	\$3,497.0	\$4,205.2	\$13,200.0
Reduction in FY 2016 State Contribution:	\$1,163.4	\$104.0	\$199.4	\$860.0
Reduction in FY 2016 - FY 2045 Cumulative Contributions:	\$144,922.8	\$30,303.0	\$29,279.8	\$85,340.0
*All projections based off of 2013 valuation from each retirement system				

In addition to the cost study performed by Segal, the Commission was asked to comment on the reduction in savings that resulted when the State systems updated their SB 1 projections using the FY 2013 baseline after the bill was signed into law; or, in other words, why the cumulative savings was reduced from \$160 billion to \$145 billion. To date, CGFA has not

been provided with a precise actuarial reconciliation of this difference, as these projections were performed by the system actuaries. In performing cost studies for the SB 1 Conference Committee, the system actuaries calculated their savings estimates using FY 2012 membership data. While these studies reflected the most up-to-date information that was available to the Conference Committee last fall, the FY 2012 projections have been supplanted by the FY 2013 projections performed by both the system actuaries and by Segal. Hence, the FY 2012 results are not directly comparable to the FY 2013 results.

We believe the \$15 billion savings reduction that resulted from using the FY 2013 baseline was due mainly to very positive investment returns in FY 2013, which had the effect of lowering the pre-SB 1 baseline contributions. However, it is possible that other factors may have contributed to this reduction. The Commission has requested that the State system actuaries provide us with a precise reconciliation of this \$15 billion reduction. When this information is obtained, this analysis will be updated to include that information. In sum, we believe that any attempt to compare actuarial cost studies that are made using two different sets of baseline data is a tenuous exercise, and we would reiterate that the SB 1 cost studies performed by both Segal and the system actuaries using FY 2013 data should be considered the latest and most up-to-date information available.

If there are any questions on this analysis, please feel free to contact the Commission.

DRL:dkb
S407 SB 1 Segal Study



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March 21, 2014

Via E-Mail

Dan R. Long
Executive Director
Commission on Government Forecasting and Accountability
703 Stratton Office Bldg.
Springfield, IL 62706

Re: **Baseline Projections Using July 1, 2013 Actuarial Valuations and
Cost Projections Under PA 98-0599**

Dear Dan:

As requested, we have performed an analysis regarding the impact of changes included in Public Act 98-0599 on projected costs of the Teachers' Retirement System (TRS), State Employees' Retirement System (SERS), and State Universities Retirement System (SURS). Attached are exhibits that show the projected contributions, actuarial liabilities, actuarial assets, and funded position through 2045 for each System before (Exhibits 1-3) and after (Exhibits 4-6) Public Act 98-0599.

Based on our understanding, Public Act 98-0599 includes the following changes (generally effective June 1, 2014) that impact contribution amounts and funded position:

1. Contributions are based on an actuarially sound funding schedule to achieve 100% funding no later than the end of fiscal 2044. Contributions are based on the Entry Age Normal actuarial cost method, with contributions determined as a level percentage of payroll.
2. The State will make supplemental contributions of (i) \$364 million in fiscal year 2019, (ii) \$1 billion annually in fiscal year 2020 and each year thereafter through fiscal year 2045, or until the systems reach a funded percentage of 100%, and (iii) 10% of the annual savings resulting from pension reform beginning in fiscal year 2016 until the systems reach a funded percentage of 100%. State contributions determined under item #1 above will not be reduced by these amounts.
3. The required contribution rate for Tier 1 members decreases by 1%.
4. Starting January 1, 2015, future Automatic Annual Increases (AAI) for current and future Tier 1 retirees are equal to 3% of the lesser of (i) the total annuity payable at the time of the increase, including previously granted increases or (ii) \$1,000 multiplied by years of service (\$800 for members coordinated with Social Security). The \$1,000/\$800 amount is adjusted each year by the CPI.



5. Tier 1 members who retire on or after July 1, 2014, will miss annual adjustments depending on age: employees 50 or over miss one AAI (year 2); 49-47 miss three adjustments (years 2, 4, and 6); 46-44 miss four adjustments (years 2, 4, 6, and 8); 43 and under miss five adjustments (years 2, 4, 6, 8, and 10).
6. The Tier 2 salary cap (\$109,971 for 2013) is applied to Tier 1 members. Tier 1 members who are receiving earnings that exceed the limitation as of June 1, 2014, are grandfathered and pensionable earnings will be limited to the member's annualized rate of earnings as of June 1, 2014.
7. For Tier 1 members 45 years of age or younger, the retirement eligibility age is increased on a graduated scale. For each year a member is under 46, the retirement age is increased by 4 months (up to 5 years).
8. For all purposes, the Effective Rate of Interest (ERI) for SURS and the rate of regular interest for TRS will be the interest rate paid by 30-year U.S. Treasury bonds plus 75 basis points.
9. An optional defined contribution plan will be available for no more than 5% of Tier 1 members.

Exhibits 4-6 show the derivation of the State contribution (under Public Act 98-0599) and the reduction in State contribution (including supplemental contributions due from the State), as well as the present value of the reduction. A summary of the contribution savings through fiscal year 2045 for each System is shown below:

(\$ in millions)	Total State Contribution		Reduction in State Contribution	PV of Reduction in State Contribution
	Prior to Public Act 98-0599	Reflecting Public Act 98-0599		
TRS	\$ 187,225	\$ 108,727	\$ 78,498	\$ 14,171
SERS	90,048	60,130	29,918	4,550
SURS	70,818	41,824	28,994	5,136
Total	\$ 348,091	\$ 210,681	\$ 137,410	\$ 23,857

The portion of total contribution savings shown above that is due to the benefit change provisions contained in Public Act 98-0599 is approximately 75%. The remaining 25% savings is due to the financing related changes.

Public Act 98-0599 requires a change to the prescribed cost allocation method used to allocate active members' actuarial present value of benefits to past, current and future service. Prior to this change, the prescribed method was the Projected Unit Credit (PUC) actuarial cost method. Costs for an active member under PUC generally accrue in proportion to the value of a benefit earned in a given year. The normal cost for an active member under PUC tends to be relatively small early in the career and increases rapidly as the member approaches retirement eligibility.

Entry Age Normal (EAN) – the actuarial cost method required under Public Act 98-0599 – allocates the entire value of an active member's projected benefit such that it accrues as a level percentage of the member's projected payroll throughout their career. The result is a normal cost that is a level percentage for each member, relative to their salary. Both actuarial cost methods are acceptable by actuarial standards and both are used by public sector retirement systems, though the EAN method is far more prevalent. Since each method relies on separate approaches

for allocating costs to past service, the Actuarial Accrued Liability (which is used to measure the funded ratio) at a given point in time will be different. Note that since the liability for pensioners and inactive members entitled to deferred benefits is entirely attributable to past service, the Actuarial Accrued Liability for these members is the same under both actuarial cost methods.

A summary of the difference in projected Actuarial Accrued Liability (AAL) as of July 1, 2014 for each System is shown below:

(\$ in millions)	Projected AAL as of July 1, 2014		Increase/(Decrease)
	Projected Unit Credit	Entry Age Normal	
TRS	\$ 81,936	\$ 84,653	\$ 2,717
SERS	31,733	32,768	1,035
SURS	30,043	31,134	1,091

Where an interpretation of the plain language of Public Act 98-0599 was required, we relied on the method adopted by each System when developing our calculations. There are two areas of such interpretation worth mentioning, as alternate applications could have a material impact on the total State contribution amounts through fiscal year 2044 developed under Public Act 98-0599.

- 1) Calculation of contribution amounts – The calculations for SERS and SURS are based on a “normal cost plus 30-year closed amortization” approach, whereas the calculation for TRS uses the prior “level percent of payroll to achieve X% funded ratio in fiscal year Y” (where X was 90% and is now 100%, and Y was 2049 and is now 2044). We would expect that if the TRS calculation were to follow the “normal cost plus 30-year closed amortization” approach, State contributions in the early years of the projection would be slightly larger. Even within the “normal cost plus 30-year closed amortization” approaches for SERS and SURS, there is variability among the application between the two Systems. On a present value basis, however, the differences between the methods used by TRS, SERS and SURS are relatively minor. The important thing to note is that the language contained in Public Act 98-0599 can lead to different interpretations of the statutory funding requirements and clarifying language may be appropriate.
- 2) Retirement rates – Retirement eligibility is delayed for Tier 1 members by up to 5 years. The System actuaries for SERS and SURS modified the assumed rates of retirement to reflect the schedule of retirement age delay by increasing the rate at the new first eligibility age to account for the period of time that eligibility was postponed and members otherwise would have retired. TRS did not make any adjustments to their retirement rates other than adjusting for the revised eligibility. The SERS and SURS approach attempts to estimate the change in future experience in light of the known eligibility change. If experience shows that a similar assumption would have been appropriate for TRS then there will be actuarial losses due to retirement experience.

The assumptions for these projections and analysis are based on those listed in the 2013 actuarial valuation reports for TRS, SERS and SURS as completed by each System’s actuary. Our calculations rely on the same census data, financial information, actuarial assumptions and methods, and benefit change provisions under Public Act 98-0599 as those used by the System’s actuaries. While the total State contribution savings through fiscal year 2045 determined by our

Mr. Dan R. Long
Commission on Government Forecasting and Accountability
March 21, 2014
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analysis was \$7.5 billion lower than the total amount certified by the Systems, the present value of the savings was reasonably close (\$23.86 billion in total by our calculation, compared to \$25.80 billion from the Systems' calculations).

On Exhibits 4-6, the amounts under the column "Reduction in State/Supplemental Contribution" are not discounted to reflect the time value of money. The "Present Value of Reduction in State/Supplemental Contribution" column is a more appropriate figure to assess the financial impact of changes.

Comments about Projections

Projections, by their nature, are not a guarantee of future results. The modeled projections are intended to serve as estimates of future financial outcomes that are based on the information available to us at the time the modeling is undertaken and completed, and the agreed upon assumptions and methodologies described herein. Emerging results may differ significantly if the actual experience proves to be different from these assumptions or if alternative methodologies are used. Actual experience may differ due to such variables as demographic experience, the economy, stock market performance and the regulatory environment. The longer the projection period, the less predictable the projections become.

Please let us know if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew A. Strom". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Matthew A. Strom, FSA, MAAA, EA
Consulting Actuary

cc: Mr. Dan Hankiewicz
Ms. Kim Nicholl

Funding Projections for the Teachers' Retirement System
 CoGFA Projections Based on Laws in Effect on June 30, 2013
 Actuarially Assumed Rate of Return: 8.00%
 (\$ in millions)

Fiscal Year Ending 6/30	Annual Payroll	Total State Contribution	State Contribution as Percent of Payroll	Total Employee Contribution	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Liability	Funded Ratio
2013					\$93,887.0	\$38,155.2	\$55,731.8	40.6%
2014	\$9,707.6	\$3,437.3	35.4%	\$1,008.2	97,787.5	41,695.3	56,092.2	42.6%
2015	10,231.1	3,261.2	31.9%	1,065.3	101,781.5	44,631.7	57,149.8	43.9%
2016	10,594.7	3,373.6	31.8%	1,108.9	105,841.2	46,708.1	59,133.1	44.1%
2017	10,974.2	3,526.6	32.1%	1,154.6	109,973.2	49,484.5	60,488.8	45.0%
2018	11,426.8	3,655.6	32.0%	1,202.2	114,179.5	52,011.1	62,168.4	45.6%
2019	11,895.6	3,809.6	32.0%	1,251.5	118,463.9	54,654.3	63,809.7	46.1%
2020	12,385.3	3,957.3	32.0%	1,303.0	122,826.8	57,413.9	65,412.9	46.7%
2021	12,899.2	4,115.1	31.9%	1,357.1	127,271.7	60,309.2	66,962.5	47.4%
2022	13,436.3	4,282.5	31.9%	1,413.6	131,799.9	63,362.5	68,437.4	48.1%
2023	13,996.5	4,459.5	31.9%	1,472.5	136,409.3	66,597.3	69,812.0	48.8%
2024	14,578.1	4,630.7	31.8%	1,533.7	141,093.9	70,008.7	71,085.2	49.6%
2025	15,179.5	4,811.4	31.7%	1,597.0	145,843.5	73,613.4	72,230.1	50.5%
2026	15,801.0	5,016.3	31.7%	1,662.4	150,641.7	77,442.6	73,199.1	51.4%
2027	16,437.8	5,228.0	31.8%	1,729.4	155,463.8	81,498.6	73,965.2	52.4%
2028	17,087.9	5,431.2	31.8%	1,797.8	160,288.9	85,749.0	74,539.9	53.5%
2029	17,750.9	5,641.1	31.8%	1,867.5	165,099.1	90,221.5	74,877.6	54.6%
2030	18,418.5	5,840.1	31.7%	1,937.8	169,869.6	94,908.0	74,961.6	55.9%
2031	19,069.1	6,036.2	31.7%	2,006.2	174,566.1	99,805.1	74,760.9	57.2%
2032	19,697.5	6,242.3	31.7%	2,072.3	179,155.3	104,909.8	74,245.5	58.6%
2033	20,296.4	6,455.1	31.8%	2,135.4	183,604.9	110,222.9	73,382.1	60.0%
2034	20,865.2	6,976.9	33.4%	2,195.2	187,879.8	116,057.2	71,822.6	61.8%
2035	21,409.6	7,158.0	33.4%	2,252.5	191,944.9	122,088.8	69,856.2	63.6%
2036	21,929.5	7,331.3	33.4%	2,307.2	195,773.5	128,306.4	67,467.2	65.5%
2037	22,427.2	7,497.7	33.4%	2,359.5	199,331.6	134,733.4	64,598.2	67.6%
2038	22,895.8	7,654.4	33.4%	2,408.8	202,565.7	141,338.7	61,227.0	69.8%
2039	23,332.8	7,800.5	33.4%	2,454.8	205,440.5	148,103.6	57,336.9	72.1%
2040	23,745.2	7,938.4	33.4%	2,498.2	207,920.4	155,026.0	52,894.5	74.6%
2041	24,140.3	8,070.4	33.4%	2,539.8	210,004.0	162,115.9	47,888.1	77.2%
2042	24,525.5	8,199.2	33.4%	2,580.3	211,709.7	169,428.8	42,281.0	80.0%
2043	24,910.8	8,328.0	33.4%	2,620.8	213,084.1	177,053.1	36,031.0	83.1%
2044	25,307.5	8,460.7	33.4%	2,662.6	214,196.0	185,089.3	29,106.7	86.4%
2045	25,719.2	8,598.3	33.4%	2,705.9	215,135.4	193,621.8	21,513.5	90.0%
		\$187,224.5						

Funding Projections for the State Employees' Retirement System

CoGFA Projections Based on Laws in Effect on June 30, 2013

Actuarially Assumed Rate of Return: 7.75%

(\$ in millions)

Fiscal Year Ending 6/30	Annual Payroll	Total State Contribution	State Contribution as Percent of Payroll	Total Employee Contribution	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Liability	Funded Ratio
2013					\$34,720.8	\$11,877.4	\$22,843.3	34.2%
2014	\$4,326.0	\$1,662.7	38.4%	\$241.0	36,237.7	13,041.1	23,196.6	36.0%
2015	4,416.0	1,781.2	40.3%	249.0	37,782.1	14,290.0	23,492.1	37.8%
2016	4,567.9	1,831.6	40.1%	257.1	39,355.4	15,328.3	24,027.0	38.9%
2017	4,714.5	1,876.3	39.8%	264.8	40,951.0	16,553.6	24,397.3	40.4%
2018	4,858.9	1,927.2	39.7%	272.3	42,550.0	17,665.6	24,884.4	41.5%
2019	5,007.3	1,986.1	39.7%	280.1	44,178.6	18,822.2	25,356.3	42.6%
2020	5,149.2	2,037.9	39.6%	287.4	45,804.6	19,985.7	25,818.9	43.6%
2021	5,297.9	2,093.1	39.5%	295.2	47,412.0	21,155.3	26,256.7	44.6%
2022	5,448.9	2,149.8	39.5%	303.0	48,992.3	22,323.2	26,669.1	45.6%
2023	5,594.7	2,204.7	39.4%	310.0	50,536.1	23,479.1	27,057.0	46.5%
2024	5,750.1	2,259.3	39.3%	317.6	52,025.8	24,615.0	27,410.8	47.3%
2025	5,903.5	2,314.0	39.2%	324.4	53,442.2	25,722.4	27,719.7	48.1%
2026	6,062.4	2,376.4	39.2%	331.7	54,788.1	26,807.2	27,980.9	48.9%
2027	6,227.1	2,441.8	39.2%	339.1	56,050.4	27,867.6	28,182.8	49.7%
2028	6,394.0	2,503.8	39.2%	346.3	57,228.7	28,899.2	28,329.5	50.5%
2029	6,573.8	2,572.0	39.1%	354.4	58,319.5	29,912.1	28,407.5	51.3%
2030	6,760.7	2,639.1	39.0%	362.7	59,317.8	30,908.6	28,409.2	52.1%
2031	6,959.3	2,712.1	39.0%	372.0	60,232.5	31,900.7	28,331.8	53.0%
2032	7,164.6	2,793.7	39.0%	381.3	61,055.8	32,900.4	28,155.5	53.9%
2033	7,376.7	2,883.6	39.1%	390.6	61,794.4	33,924.2	27,870.2	54.9%
2034	7,597.5	3,213.2	42.3%	400.1	62,423.8	35,220.0	27,203.8	56.4%
2035	7,791.9	3,295.4	42.3%	405.0	62,941.4	36,548.4	26,393.0	58.1%
2036	8,025.4	3,394.1	42.3%	415.0	63,362.6	37,960.4	25,402.3	59.9%
2037	8,256.1	3,491.7	42.3%	424.9	63,699.6	39,470.7	24,228.9	62.0%
2038	8,495.3	3,592.9	42.3%	435.5	63,968.1	41,106.4	22,861.7	64.3%
2039	8,736.6	3,694.9	42.3%	446.4	64,176.1	42,890.4	21,285.7	66.8%
2040	8,979.2	3,797.5	42.3%	457.6	64,333.8	44,847.3	19,486.4	69.7%
2041	9,220.7	3,899.7	42.3%	468.9	64,450.3	47,002.5	17,447.8	72.9%
2042	9,462.0	4,001.7	42.3%	480.2	64,531.0	49,383.9	15,147.1	76.5%
2043	9,703.8	4,104.0	42.3%	491.7	64,587.8	52,022.1	12,565.7	80.5%
2044	9,947.2	4,206.9	42.3%	503.3	64,627.7	54,947.7	9,680.0	85.0%
2045	10,190.4	4,309.8	42.3%	514.8	64,659.9	58,193.9	6,466.0	90.0%
		\$90,048.2						

Funding Projections for the State Universities Retirement System

CoGFA Projections Based on Laws in Effect on June 30, 2013

Actuarially Assumed Rate of Return: 7.75%

(\$ in millions)

Fiscal Year Ending 6/30	Annual Payroll	Total State Contribution	State Contribution as Percent of Payroll	Total Employee Contribution	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Liability	Funded Ratio
2013					\$34,373.1	\$14,262.6	\$20,110.5	41.5%
2014	\$4,336.1	\$1,505.8	34.7%	\$290.0	35,609.3	15,581.9	20,027.3	43.8%
2015	4,491.7	1,541.4	34.3%	301.0	36,842.8	16,769.8	20,073.0	45.5%
2016	4,594.6	1,554.4	33.8%	307.5	38,058.8	17,557.2	20,501.6	46.1%
2017	4,700.2	1,594.6	33.9%	314.1	39,250.4	18,559.8	20,690.5	47.3%
2018	4,814.0	1,622.7	33.7%	321.2	40,411.7	19,416.3	20,995.3	48.0%
2019	4,931.4	1,660.9	33.7%	328.5	41,533.0	20,258.5	21,274.5	48.8%
2020	5,051.2	1,699.7	33.6%	335.8	42,607.8	21,080.9	21,526.9	49.5%
2021	5,176.0	1,740.7	33.6%	343.6	43,636.0	21,887.3	21,748.7	50.2%
2022	5,300.8	1,781.8	33.6%	351.4	44,612.8	22,674.8	21,938.1	50.8%
2023	5,433.4	1,825.8	33.6%	359.8	45,546.1	23,453.9	22,092.2	51.5%
2024	5,571.2	1,871.6	33.6%	368.5	46,431.0	24,223.5	22,207.5	52.2%
2025	5,711.0	1,918.2	33.6%	377.4	47,270.6	24,987.7	22,282.9	52.9%
2026	5,857.1	1,967.3	33.6%	386.8	48,071.7	25,757.3	22,314.4	53.6%
2027	6,003.9	2,016.8	33.6%	396.3	48,832.7	26,532.4	22,300.4	54.3%
2028	6,156.9	2,068.7	33.6%	406.2	49,566.9	27,329.0	22,238.0	55.1%
2029	6,313.5	2,119.4	33.6%	416.5	50,273.6	28,149.7	22,124.0	56.0%
2030	6,470.6	2,166.0	33.5%	426.8	50,958.5	28,997.8	21,960.7	56.9%
2031	6,637.1	2,217.0	33.4%	437.6	51,621.1	29,883.5	21,737.6	57.9%
2032	6,800.2	2,271.4	33.4%	448.0	52,266.5	30,820.1	21,446.5	59.0%
2033	6,974.4	2,335.4	33.5%	459.1	52,906.9	31,831.7	21,075.2	60.2%
2034	7,154.8	2,412.0	33.7%	470.6	53,541.2	32,940.6	20,600.6	61.5%
2035	7,337.0	2,472.5	33.7%	482.1	54,174.3	34,144.0	20,030.2	63.0%
2036	7,531.7	2,537.5	33.7%	494.4	54,807.0	35,460.0	19,347.0	64.7%
2037	7,723.4	2,600.4	33.7%	506.3	55,423.1	36,882.7	18,540.4	66.5%
2038	7,923.8	2,665.8	33.6%	518.7	56,033.6	38,434.9	17,598.7	68.6%
2039	8,128.4	2,731.8	33.6%	531.1	56,638.7	40,133.1	16,505.6	70.9%
2040	8,330.7	2,796.3	33.6%	543.2	57,239.0	41,988.2	15,250.8	73.4%
2041	8,548.8	2,866.3	33.5%	556.4	57,854.2	44,032.7	13,821.5	76.1%
2042	8,778.5	2,940.0	33.5%	570.3	58,505.3	46,299.9	12,205.4	79.1%
2043	9,023.8	3,019.3	33.5%	585.2	59,213.4	48,825.3	10,388.2	82.5%
2044	9,284.0	3,103.6	33.4%	601.1	59,995.3	51,641.0	8,354.3	86.1%
2045	9,557.1	3,192.4	33.4%	617.9	60,867.9	54,781.1	6,086.8	90.0%
		\$70,817.5						

Funding Projections for the Teachers' Retirement System

Projections Based on Public Act 98-0599, Including Both Fortner and Additional Supplemental Payments
 Actuarially Assumed Rate of Return: 8.00%
 (\$ in millions)

Fiscal Year Ending 6/30	Annual Payroll	Total State Contribution	State Contribution as Percent of Payroll	Stabilization and Supplemental Contribution	Total State and Supplemental Contribution	Total Employee Contribution	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Liability	Funded Ratio	Reduction in State/ Supplemental Contribution	Present Value of Reduction in State/Supp. Contribution
2013							\$93,887.0	\$38,155.2	\$55,731.8	40.6%		
2014	\$9,707.6	\$3,437.3	35.4%	\$0.0	\$3,437.3	\$1,008.2	84,653.2	41,677.8	42,975.4	49.2%	\$0.0	\$0.0
2015	9,870.7	3,261.2	33.0%	0.0	3,261.2	924.6	87,004.8	44,524.5	42,480.3	51.2%	0.0	0.0
2016	10,194.4	2,464.6	24.2%	100.0	2,564.6	959.4	89,366.8	45,725.5	43,641.3	51.2%	-809.0	-667.4
2017	10,528.2	2,572.9	24.4%	100.0	2,672.9	995.6	91,746.6	47,592.8	44,153.8	51.9%	-853.7	-652.1
2018	10,926.9	2,647.8	24.2%	110.0	2,757.8	1,032.8	94,145.8	49,184.6	44,961.2	52.2%	-897.8	-635.0
2019	11,333.4	2,746.3	24.2%	301.9	3,048.1	1,070.8	96,566.6	51,057.0	45,509.6	52.9%	-761.5	-498.7
2020	11,757.2	2,849.0	24.2%	624.5	3,473.5	1,110.4	99,009.6	53,374.0	45,635.6	53.9%	-483.8	-293.3
2021	12,199.8	2,956.2	24.2%	624.5	3,580.8	1,151.8	101,478.0	55,843.1	45,634.9	55.0%	-534.3	-300.0
2022	12,656.5	3,066.9	24.2%	634.5	3,701.4	1,194.4	103,972.7	58,494.6	45,478.1	56.3%	-581.1	-302.1
2023	13,135.0	3,182.9	24.2%	644.5	3,827.4	1,239.1	106,494.0	61,352.6	45,141.4	57.6%	-632.1	-304.3
2024	13,633.3	3,303.6	24.2%	644.5	3,948.1	1,285.6	109,039.4	64,420.0	44,619.4	59.1%	-682.6	-304.2
2025	14,145.6	3,427.7	24.2%	654.5	4,082.3	1,333.4	111,603.9	67,724.8	43,879.0	60.7%	-729.1	-300.9
2026	14,676.6	3,556.4	24.2%	664.5	4,220.9	1,383.0	114,196.4	71,302.8	42,893.6	62.4%	-795.4	-303.9
2027	15,242.7	3,693.6	24.2%	674.5	4,368.1	1,435.8	116,820.3	75,182.1	41,638.2	64.4%	-859.9	-304.2
2028	15,821.2	3,833.8	24.2%	684.5	4,518.3	1,489.8	119,459.8	79,358.1	40,101.8	66.4%	-912.9	-299.1
2029	16,408.9	3,976.2	24.2%	694.5	4,670.7	1,544.6	122,102.4	83,856.6	38,245.9	68.7%	-970.4	-294.4
2030	17,005.4	4,120.7	24.2%	694.5	4,815.3	1,600.2	124,757.3	88,707.3	36,049.9	71.1%	-1,024.8	-287.8
2031	17,608.8	4,266.9	24.2%	704.5	4,971.5	1,656.4	127,479.5	94,006.9	33,472.7	73.7%	-1,064.7	-276.9
2032	18,198.9	4,409.9	24.2%	714.5	5,124.5	1,711.4	130,191.7	99,700.0	30,491.7	76.6%	-1,117.8	-269.2
2033	18,775.7	4,549.7	24.2%	714.5	5,264.2	1,765.1	132,877.0	105,787.8	27,089.2	79.6%	-1,190.9	-265.5
2034	19,344.3	4,687.5	24.2%	764.5	5,452.0	1,818.1	135,553.9	112,370.2	23,183.6	82.9%	-1,524.9	-314.8
2035	19,920.5	4,827.1	24.2%	764.5	5,591.6	1,871.8	138,307.0	119,521.5	18,785.5	86.4%	-1,566.4	-299.4
2036	20,485.5	4,964.0	24.2%	774.5	5,738.6	1,924.4	141,035.8	127,184.6	13,851.2	90.2%	-1,592.7	-281.9
2037	21,042.5	5,099.0	24.2%	774.5	5,873.5	1,976.2	143,709.4	135,366.9	8,342.5	94.2%	-1,624.2	-266.2
2038	21,593.2	5,232.4	24.2%	774.5	6,007.0	2,027.5	146,353.3	144,134.8	2,218.5	98.5%	-1,647.4	-250.0
2039	22,155.5	980.6	4.4%	774.5	1,755.2	2,079.9	149,087.8	149,087.8	0.0	100.0%	-6,045.3	-849.4
2040	22,704.8	0.0	0.0%	0.0	0.0	2,131.0	151,749.4	152,349.7	-600.3	100.4%	-7,938.4	-1,032.8
2041	23,249.1	0.0	0.0%	0.0	0.0	2,181.7	154,301.2	155,576.0	-1,274.8	100.8%	-8,070.4	-972.2
2042	23,788.8	0.0	0.0%	0.0	0.0	2,232.1	156,783.6	158,815.9	-2,032.4	101.3%	-8,199.2	-914.5
2043	24,331.4	0.0	0.0%	0.0	0.0	2,282.8	159,376.4	162,253.9	-2,877.5	101.8%	-8,328.0	-860.1
2044	24,841.7	0.0	0.0%	0.0	0.0	2,330.5	162,291.2	166,103.6	-3,812.4	102.3%	-8,460.7	-809.1
2045	25,292.9	0.0	0.0%	0.0	0.0	2,372.8	165,763.8	170,600.1	-4,836.3	102.9%	-8,598.3	-761.3
		\$94,114.2		\$14,611.9	\$108,726.8						-\$78,497.7	-\$14,170.7

Funding Projections for the State Employees' Retirement System

Projections Based on Public Act 98-0599, Including Both Fortner and Additional Supplemental Payments
Actuarially Assumed Rate of Return: 7.75%
(\$ in millions)

Fiscal Year Ending 6/30	Annual Payroll	Total State Contribution	State Contribution as Percent of Payroll	Stabilization and Supplemental Contribution	Total State and Supplemental Contribution	Total Employee Contribution	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Liability	Funded Ratio	Reduction in State/ Supplemental Contribution	Present Value of Reduction in State/Supp. Contribution
2013							\$34,720.8	\$11,877.4	\$22,843.3	34.2%		
2014	\$4,326.0	\$1,662.7	38.4%	\$0.0	\$1,662.7	\$241.0	32,767.6	13,041.1	19,726.5	39.8%	\$0.0	\$0.0
2015	4,407.2	1,781.2	40.4%	0.0	1,781.2	208.5	33,795.6	14,235.6	19,560.0	42.1%	0.0	0.0
2016	4,538.0	1,646.8	36.3%	11.5	1,658.3	215.6	34,829.9	15,055.4	19,774.5	43.2%	-173.3	-143.8
2017	4,668.0	1,687.7	36.2%	12.5	1,700.2	222.6	35,859.6	16,064.3	19,795.3	44.8%	-176.1	-135.6
2018	4,790.1	1,715.9	35.8%	16.5	1,732.4	229.3	36,873.0	16,944.9	19,928.1	46.0%	-194.8	-139.2
2019	4,913.6	1,754.1	35.7%	93.1	1,847.2	236.3	37,891.2	17,936.5	19,954.7	47.3%	-138.9	-92.1
2020	5,037.1	1,792.6	35.6%	227.3	2,019.9	243.3	38,883.1	19,077.1	19,806.0	49.1%	-18.0	-11.1
2021	5,157.1	1,831.1	35.5%	228.9	2,060.0	250.3	39,844.5	20,239.4	19,605.2	50.8%	-33.1	-18.9
2022	5,286.5	1,872.2	35.4%	231.9	2,104.1	257.9	40,769.3	21,423.6	19,345.7	52.5%	-45.7	-24.2
2023	5,404.7	1,911.3	35.4%	235.0	2,146.3	264.7	41,640.9	22,619.0	19,021.9	54.3%	-58.4	-28.7
2024	5,528.8	1,945.3	35.2%	238.0	2,183.3	271.8	42,451.5	23,823.4	18,628.1	56.1%	-76.0	-34.7
2025	5,662.8	1,987.5	35.1%	240.8	2,228.3	279.3	43,203.4	25,045.8	18,157.7	58.0%	-85.7	-36.3
2026	5,794.4	2,023.0	34.9%	244.0	2,267.0	286.7	43,885.3	26,282.0	17,603.3	59.9%	-109.4	-43.0
2027	5,936.6	2,066.8	34.8%	247.6	2,314.4	294.5	44,495.4	27,538.6	16,956.8	61.9%	-127.4	-46.5
2028	6,074.4	2,103.1	34.6%	250.7	2,353.8	302.1	45,020.9	28,810.5	16,210.4	64.0%	-150.0	-50.8
2029	6,228.8	2,149.4	34.5%	253.9	2,403.3	310.5	45,484.5	30,129.6	15,354.9	66.2%	-168.7	-53.0
2030	6,405.9	2,193.0	34.2%	256.3	2,449.3	320.4	45,887.0	31,505.6	14,381.4	68.7%	-189.8	-55.4
2031	6,586.7	2,243.4	34.1%	259.0	2,502.4	330.1	46,230.9	32,951.8	13,279.0	71.3%	-209.7	-56.8
2032	6,778.6	2,288.6	33.8%	262.2	2,550.8	340.4	46,508.0	34,471.8	12,036.2	74.1%	-242.9	-61.0
2033	6,979.9	2,342.9	33.6%	265.6	2,608.5	351.2	46,739.4	36,099.2	10,640.2	77.2%	-275.1	-64.2
2034	7,206.2	2,393.7	33.2%	291.9	2,685.6	363.4	46,924.5	37,870.3	9,054.2	80.7%	-527.6	-114.2
2035	7,418.5	2,450.0	33.0%	294.8	2,744.8	371.7	47,055.7	39,769.5	7,286.3	84.5%	-550.6	-110.6
2036	7,658.1	2,502.7	32.7%	297.8	2,800.4	384.1	47,152.8	41,831.7	5,321.1	88.7%	-593.7	-110.7
2037	7,910.4	2,565.6	32.4%	300.5	2,866.1	397.2	47,239.0	44,097.0	3,142.0	93.3%	-625.6	-108.3
2038	8,170.4	2,622.1	32.1%	303.0	2,925.1	411.1	47,324.3	46,592.6	731.7	98.5%	-667.8	-107.3
2039	8,441.9	1,136.8	13.5%	0.0	1,136.8	424.7	47,422.1	47,422.1	0.0	100.0%	-2,558.1	-381.3
2040	8,704.1	384.0	4.4%	0.0	384.0	438.2	47,529.0	47,529.0	0.0	100.0%	-3,413.5	-472.2
2041	8,966.9	390.3	4.4%	0.0	390.3	451.7	47,656.7	47,656.7	0.0	100.0%	-3,509.4	-450.6
2042	9,232.5	396.6	4.3%	0.0	396.6	465.3	47,822.5	47,822.5	0.0	100.0%	-3,605.1	-429.6
2043	9,504.1	403.3	4.2%	0.0	403.3	478.7	48,036.7	48,036.7	0.0	100.0%	-3,700.7	-409.2
2044	9,766.3	408.9	4.2%	0.0	408.9	492.0	48,297.5	48,297.5	0.0	100.0%	-3,798.0	-389.8
2045	10,037.5	414.3	4.1%	0.0	414.3	505.6	48,602.9	48,602.9	0.0	100.0%	-3,895.5	-371.0
		\$55,066.9		\$5,062.8	\$60,129.6						-\$29,918.6	-\$4,550.1

Funding Projections for the State Universities Retirement System

Projections Based on Public Act 98-0599, Including Both Fortner and Additional Supplemental Payments

Actuarially Assumed Rate of Return: 7.75%

(\$ in millions)

Fiscal Year Ending 6/30	Annual Payroll	Total State Contribution	State Contribution as Percent of Payroll	Stabilization and Supplemental Contribution	Total State and Supplemental Contribution	Total Employee Contribution	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Liability	Funded Ratio	Reduction in State/ Supplemental Contribution	Present Value of Reduction in State/Supp. Contribution
2013							\$30,371.5	\$14,262.6	\$16,108.9	47.0%		
2014	\$4,284.0	\$1,505.8	35.1%	\$0.0	\$1,505.8	\$290.0	31,134.1	15,581.9	15,552.2	50.0%	\$0.0	\$0.0
2015	4,426.3	1,541.4	34.8%	0.0	1,541.4	265.4	31,883.2	16,754.5	15,128.6	52.5%	0.0	0.0
2016	4,505.2	1,365.5	30.3%	22.2	1,387.7	271.6	32,606.4	17,381.0	15,225.4	53.3%	-166.7	-138.3
2017	4,595.0	1,348.8	29.4%	26.1	1,374.9	278.3	33,305.2	18,192.9	15,112.4	54.6%	-219.7	-169.2
2018	4,687.2	1,366.9	29.2%	28.8	1,395.7	285.1	33,975.3	18,878.3	15,097.1	55.6%	-227.0	-162.2
2019	4,790.9	1,370.1	28.6%	96.6	1,466.7	292.5	34,614.3	19,618.6	14,995.7	56.7%	-194.2	-128.8
2020	4,895.2	1,382.3	28.2%	213.5	1,595.8	299.9	35,220.5	20,480.4	14,740.1	58.1%	-103.9	-64.0
2021	5,006.2	1,394.6	27.9%	215.8	1,610.4	307.8	35,794.3	21,356.6	14,437.7	59.7%	-130.3	-74.4
2022	5,123.4	1,407.9	27.5%	218.1	1,626.0	316.1	36,336.4	22,250.9	14,085.5	61.2%	-155.8	-82.6
2023	5,242.8	1,423.5	27.2%	220.4	1,643.9	324.6	36,848.8	23,171.2	13,677.6	62.9%	-181.9	-89.5
2024	5,373.4	1,440.4	26.8%	222.6	1,663.0	333.8	37,337.5	24,126.8	13,210.7	64.6%	-208.6	-95.3
2025	5,508.8	1,460.3	26.5%	224.9	1,685.2	343.3	37,809.9	25,131.8	12,678.2	66.5%	-233.0	-98.8
2026	5,648.8	1,482.2	26.2%	227.1	1,709.3	353.3	38,278.0	26,203.6	12,074.4	68.5%	-258.0	-101.5
2027	5,804.0	1,506.3	26.0%	229.4	1,735.6	364.3	38,749.3	27,355.0	11,394.2	70.6%	-281.2	-102.6
2028	5,958.7	1,533.9	25.7%	231.6	1,765.6	375.3	39,230.7	28,601.7	10,629.0	72.9%	-303.1	-102.7
2029	6,118.2	1,563.4	25.6%	233.8	1,797.2	386.7	39,731.8	29,959.4	9,772.4	75.4%	-322.2	-101.3
2030	6,288.2	1,595.5	25.4%	235.4	1,830.9	398.8	40,258.6	31,442.2	8,816.4	78.1%	-335.1	-97.8
2031	6,457.8	1,629.6	25.2%	237.1	1,866.7	410.9	40,824.9	33,072.4	7,752.5	81.0%	-350.3	-94.9
2032	6,641.8	1,665.7	25.1%	239.6	1,905.3	423.8	41,424.0	34,853.7	6,570.3	84.1%	-366.1	-92.0
2033	6,812.1	1,702.8	25.0%	242.8	1,945.6	435.6	42,058.1	36,798.6	5,259.5	87.5%	-389.8	-90.9
2034	6,980.7	1,740.6	24.9%	246.2	1,986.7	447.1	42,734.6	38,924.5	3,810.1	91.1%	-425.3	-92.1
2035	7,161.2	1,778.7	24.8%	249.0	2,027.7	459.5	43,468.8	41,257.1	2,211.7	94.9%	-444.8	-89.4
2036	7,353.5	1,816.7	24.7%	252.0	2,068.7	472.7	44,267.7	43,814.0	453.7	99.0%	-468.8	-87.4
2037	7,556.0	688.2	9.1%	0.0	688.2	486.5	45,140.4	45,140.4	0.0	100.0%	-1,912.2	-330.9
2038	7,760.6	224.1	2.9%	0.0	224.1	500.2	46,097.2	46,097.2	0.0	100.0%	-2,441.7	-392.2
2039	7,983.4	231.1	2.9%	0.0	231.1	514.9	47,157.4	47,157.4	0.0	100.0%	-2,500.7	-372.8
2040	8,224.0	238.4	2.9%	0.0	238.4	530.8	48,322.8	48,322.8	0.0	100.0%	-2,557.9	-353.9
2041	8,454.1	245.9	2.9%	0.0	245.9	545.7	49,598.0	49,598.0	0.0	100.0%	-2,620.4	-336.4
2042	8,691.1	253.3	2.9%	0.0	253.3	560.8	51,000.1	51,000.1	0.0	100.0%	-2,686.7	-320.1
2043	8,935.6	261.1	2.9%	0.0	261.1	576.2	52,537.2	52,537.2	0.0	100.0%	-2,758.2	-305.0
2044	9,176.2	268.6	2.9%	0.0	268.6	591.1	54,214.5	54,214.5	0.0	100.0%	-2,835.0	-291.0
2045	9,425.6	277.2	2.9%	0.0	277.2	606.5	56,039.3	56,039.3	0.0	100.0%	-2,915.2	-277.7
		\$37,710.8		\$4,113.0	\$41,823.7						-\$28,993.8	-\$5,135.7



Fiscal Impact of P.A. 98-0599 (SB 1)
 COGFA and System Actuarial Projections
 FY 2014 - FY 2045
 (\$ in Millions)

Reduction in Projections	Segal Total	Segal SERS	Segal SURS	Segal TRS
Reduction in FY 2014 Accrued Liabilities	\$21,079.6	\$3,470.1	\$4,475.2	\$13,134.3
Reduction in FY 2015 Accrued Liabilities	\$23,722.8	\$3,986.5	\$4,959.6	\$14,766.7
Reduction in FY 2016 State Contributions	\$1,182.8	\$184.9	\$188.9	\$809.0
Reduction in FY 2016 - FY 2045 Cumulative Contributions	\$137,410.2	\$29,918.6	\$28,993.8	\$78,497.7
Reduction in Projections	System Total	System SERS	System SURS	Segal TRS
Reduction in FY 2014 Accrued Liabilities	\$20,902.2	\$3,497.0	\$4,205.2	\$13,200.0
Reduction in FY 2015 Accrued Liabilities	\$23,719.1	\$3,971.3	\$4,717.9	\$15,030.0
Reduction in FY 2016 State Contributions	\$1,163.4	\$104.0	\$199.4	\$860.0
Reduction in FY 2016 - FY 2045 Cumulative Contributions	\$144,922.8	\$30,303.0	\$29,279.8	\$85,340.0
Difference in Projections	Segal Total vs. System Total	Segal SERS vs. System SERS	Segal SURS vs. System SURS	Segal TRS vs. System TRS
Reduction in FY 2016 - FY 2045 Cumulative Contributions Change as a Percentage	5.47%	1.28%	0.99%	8.72%
Reduction in FY 2016 - FY 2045 Cumulative Contributions Change as Dollars	\$7,512.6	\$384.4	\$286.0	\$6,842.3

*All projections based from 2013 valuations.

Date: 3/25/14