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January 19, 2015

Mr. Alan Conroy
Executive Director
Kansas Public Employees Retirement System
611 S. Kansas Ave., Suite 100
Topeka, KS 66603-3803

Re: Cost Study for Proposed Changes to KPERS State/School Funding

Dear Alan:

At your request, we have prepared a cost study to determine the combined impact of the following proposal on the State/School group of KPERS:

(1) An employer contribution rate of 8.65% for the last half of fiscal year 2015, 9.69% for fiscal year 2016, and 9.59% for fiscal year 2017.
(2) The amortization period is extended by 10 years.
(3) Net proceeds of $1.5 billion from a bond issued by the state of Kansas are deposited into the KPERS trust fund.
(4) The ELARF funds are not added to the trust in addition to the regular KPERS contribution.

Background

Under current law, the employer contribution rate for KPERS is not necessarily the full actuarial required contribution (ARC). Based on legislation passed in 1993, the employer contribution rate certified by the KPERS Board may not increase by more than the statutory cap. The current statutory cap is 0.90% for fiscal year 2014, 1.0% for fiscal year 2015, 1.1% for fiscal year 2016 and 1.2% for fiscal year 2017 and later. The statutory contribution rate for the Local group has been equal to the actuarial required contribution rate in the last two actuarial valuations. However, the statutory employer contribution rate for the State/School group is lower than the actuarial required contribution rate. The following table shows the actuarial required contribution and the statutory contribution rate for the State/School group in the last three valuations.

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Valuation Date	Fiscal Year	Employer Contribution Rates	
		Actuarial	Statutory
12/31/2013	2017	14.85%	13.57%
12/31/2012	2016	14.95%	12.37%
12/31/2011	2015	14.34%	11.27%

There is currently a state budget reduction plan that includes a reduction in the State/School employer contribution rate from the current statutory rate of 11.27% to 8.65% for the last half of fiscal year 2015, from 12.37% to 9.69% for fiscal year 2016, and from 13.57% to 9.59% for fiscal year 2017. Such action will lower the contributions to the State/School group by about $446 million which will have to be funded in future years (with interest at the assumed rate of 8%).

The amortization period was initially set at 40 years as part of the KPERS legislative package passed in 1993. Subsequent legislation delegated the responsibility for the parameters of the amortization policy to the KPERS Board of Trustees. To date, the Board has not changed the amortization period so, as of the last valuation date (December 31, 2013), there were 19 years remaining. Part of the proposal to be evaluated in this study is an extension of the amortization period by 10 years so the remaining years at December 31, 2013 would be 29 rather than 19. On its own, the extension of the amortization period serves to lower the actuarial contribution rate and, therefore, the employer actuarial contribution rate. However, the payments to fund the UAL now extend over a longer time period so the total amount of the contributions will be greater than if the current amortization period were unchanged.

Another provision included in our cost study is the deposit of net bond proceeds of $1.5 billion. In our analysis, we assumed, at your direction, that the debt service payments on the bond will come from a funding source other than KPERS contributions. Consequently, we have not reflected these debt service payments in any way in our cost analysis. Furthermore, for modeling purposes the bond proceeds are assumed to be deposited into the KPERS trust on December 31, 2015 as you specified. If this concept moves further and more details become available, our cost study may need to be revised to more accurately reflect the actual provisions related to the issuance of the bond.

Finally, legislation passed in the 2012 session provided for additional contributions by the State to fund the unfunded actuarial liability for the State/School group until the funded ratio was at least 80%. The additional contribution stream was to come from the Expanded Lottery Act Revenue Fund (ELARF) in the amount of 50% of the money credited to the ELARF, after a reduction of $10.5 million. Using the 2010 valuation to develop projections of the funded ratio at the time the bill was enacted, the additional ELARF contributions were expected to be required from fiscal year 2014 through fiscal year 2026. However, based on more recent projections of the funded ratio, ELARF contributions were assumed to be paid in fiscal years 2015 through 2025. For purposes of this cost study, the additional contributions from ELARF are assumed to be eliminated under the alternate scenario.

Cost Impact

It was assumed that the changes described earlier would be reflected in the December 31, 2014 actuarial valuation, which will apply to fiscal year 2018. In the interim, the employer contribution rate will be 8.65% for the last half of fiscal year 2015, 9.69% for fiscal year 2016, and 9.59% for fiscal year 2017. The determination of the employer contribution rate for fiscal year 2018 will also reflect the statutory cap of 1.2% above this revised fiscal year 2017 employer contribution rate.

We used the projection model prepared in conjunction with the December 31, 2013 actuarial valuation to estimate the long term cost impact of the current proposal. The results, which reflect the reduced contribution rate of 8.65% for the last half of fiscal year 2015, 9.69% for fiscal year 2016, 9.59% for fiscal year 2017, the deposit of $1.5 billion in bond proceeds on December 31, 2015, a 10-year extension of the unfunded actuarial liability amortization period, and elimination of the additional contributions from the ELARF fund, are compared to the baseline projections under current law. Exhibit A shows the estimated employer contribution rate and the corresponding dollar amounts of employer contributions for the proposed option and the current provisions. The alternative funding proposal results in lower contributions through 2032. (Contributions reach a peak of 14.83% in FY 2019 under the "current scenario," compared to 9.88% in FY 2018 under the alternate scenario). However, after 2032 when the unfunded actuarial liability is paid off under the current scenario, the alternate scenario produces higher contributions through 2046, with a total increase in contributions over the entire period of $3.7 billion.

Exhibit B provides a comparison of the key valuation results such as unfunded actuarial liability and funded ratio, under the current and proposed alternative. As that exhibit shows, the funded ratio under the alternate scenario increases from 60.7% to 68.4% in the December 31, 2015, valuation due to the assumed receipt of the bond proceeds of $1.5 billion. However, after that point, the funded ratio increases incrementally over a longer period of time under the alternate scenario due to the extended amortization period, reaching 80% funded in 2029 (compared to 2025 under the current scenario).

Likewise, under the alternate scenario, the unfunded actuarial liability initially declines to $5.8 billion with the addition of the bond proceeds. The unfunded actuarial liability is then projected to remain lower than "current scenario" through 2022, at which point the longer amortization period under the alternate scenario results in a higher unfunded actuarial liability through 2042.

Please note that the cost analysis provided in this letter reflects only the impact of the bond proceeds on KPERS' funding. As mentioned earlier, we assumed that the debt service payments would be paid from a source other than KPERS contributions. This "cost" has not been taken into account in our analysis as shown in Exhibits A and B. Only the impact of the proposal on KPERS' funding is shown in our exhibits.

Please note that the dollar amounts of employer contributions shown in the exhibits are future dollar amounts, calculated using the estimated employer contribution rate and projected payroll in future years. Due to the length of the projection period, the future payroll amounts grow significantly and the resulting contributions in nominal dollars in those years can appear very large. The present value of the contribution difference, using KPERS' 8% assumed rate of return, is approximately the scheduled amount of the bond proceeds of $1.5 billion. In other words, on a present value basis, the two scenarios require essentially the same amount of contributions to reach the same funded status at the same future point in time, just as would be expected. However, when expressed as nominal dollars, the alternative approach has a higher cost because contributions are generally being deferred.

The projections used in this cost study assume that all actuarial assumptions, including the 8% investment return assumption, are met each year in the future. The cost projections are sensitive to the assumptions used, particularly the investment return assumption. To the extent the 8% investment return assumption is not met in the future, the cost projections in these studies are expected to change. Further analysis can be provided upon request if it is deemed to be necessary or helpful.

The provision of this actuarial analysis is made solely for the purpose of comparing results of different financing scenarios based on investment return assumptions supplied by KPERS. The results are not intended to, and should not be interpreted as, making any recommendation or suggestion as to the advisability of any particular financing arrangement. The provision of this analysis is not considered a municipal advisory activity, nor does Cavanaugh Macdonald Consulting, LLC hold itself out as a municipal advisor as a result.

Disclaimers, Caveats, and Limitations

The numerical tables that comprises this cost study are based primarily upon the December 31, 2013 valuation results, the actuarial assumptions used in that valuation (unless otherwise noted elsewhere in this letter), and the projection model prepared by the System's actuary, Cavanaugh Macdonald Consulting, LLC. Significant items are noted below:

- The investment return in all future years is assumed to be 8% on a market value basis, unless otherwise indicated.
- All demographic assumptions regarding mortality, disability, retirement, salary increases, and termination of employment are assumed to hold true in the future. Please note that the actuarial assumption assumes that mortality will improve in the future (i.e. people will live longer).
- The number of active members covered by KPERS in the future is assumed to remain level (neither growth nor decline in the active membership count). As active members leave covered employment, they are assumed to be replaced by new employees who have a similar demographic profile as recent new hires.
- The funding methods, including the entry age normal cost method, the asset smoothing method, and the amortization method and period, remain unchanged other than as noted elsewhere in this letter.
- All projections reflect the current statutory caps of. 0.9% in FY 2014, 1.0% in FY 2015, 1.1% in FY 2016 and an ultimate cap of 1.2% in FY 2017 and beyond, except where otherwise noted.
- We relied upon the membership data provided by KPERS for the actuarial valuation. The numerical results depend on the integrity of this information. If there are material inaccuracies in the data, the results presented herein may be different and the projections may need to be revised.

Models are designed to identify anticipated trends and to compare various scenarios rather than predicting some future state of events. The projections are based on the System's estimated financial status on December 31, 2013, and project future events using one set of assumptions out of a range of many possibilities. A different set of assumptions would lead to different results. The projections do not predict the System's financial condition or its ability to pay benefits in the future and do not provide any guarantee of future financial soundness of the System. Over time, a defined benefit plan's total cost will depend on a number of factors, including the amount of benefits paid, the number of people paid benefits, the duration of the benefit payments, plan expenses, and the amount of earnings on assets invested to pay benefits. These amounts and other variables are uncertain and unknowable at the time the projections were prepared. Because not all of the assumptions will unfold exactly as expected, actual results will differ from the

projections. To the extent that actual experience deviates significantly from the assumptions, results could be significantly better or significantly worse than indicated in this study.

We are available to answer any questions on the material contained in this study or to provide explanations or further details upon request. We, Patrice A. Beckham F.S.A. and Brent A. Banister, F.S.A., are consulting actuaries with Cavanaugh Macdonald Consulting, LLC. We are also members of the American Academy of Actuaries and Fellows of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

If you have questions or need additional analysis, please let us know.

Sincerely,

Patrice Beckham

Patrice A. Beckham, FSA, FCA, EA, MAAA
Principal and Consulting Actuary

Brent A. Banister

Brent A. Banister, PhD, FSA, FCA, EA, MAAA
Chief Pension Actuary

Exhibit A

Current Provisions vs. 8.65% for Last Half of FY15, 9.69% for FY16, 9.59% for FY17, Extending Amortization for 10 Years, $1.5B Bond Proceeds, No Additional Funding from Expanded Lottery Act Revenue Fund (ELARF)

KPERS State/School Group

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Employer Contribution Rate		Employer Contribution Amount ($M)				
					Current			
Fiscal Year	Total Payroll	Current	Alternate	Payroll Based	ELARF	Total	Alternate	Difference
2015	$ 4,440.00	11.27%	11.27%/8.65%	$ 500.39	$ -	$ 500.39	$ 442.22	$ (58.16)
2016	4,554.81	12.37% *	9.69%	563.43	39.67	603.09	441.36	(161.73)
2017	4,663.16	13.57% *	9.59%	632.79	40.56	673.35	447.20	(226.16)
2018	4,784.85	14.77% *	9.88%	706.72	41.48	748.20	472.74	(275.46)
2019	4,918.20	14.83% *	9.63%	729.60	42.41	772.01	473.85	(298.16)
2020	5,061.65	14.51% *	9.27%	734.50	43.37	777.87	469.27	(308.60)
2021	5,215.15	14.19% *	9.01%	739.97	44.34	784.31	469.83	(314.48)
2022	5,378.89	14.09% *	8.94%	757.66	45.33	802.99	480.65	(322.34)
2023	5,552.28	13.96% *	8.88%	775.25	51.59	826.85	493.20	(333.65)
2024	5,734.26	13.85% *	8.84%	793.98	52.63	846.61	506.69	(339.91)
2025	5,925.05	13.72% *	8.80%	813.02	53.68	866.70	521.51	(345.19)
2026	6,124.89	13.58%	8.76%	831.84	-	831.84	536.62	(295.22)
2027	6,334.01	13.41%	8.72%	849.37	-	849.37	552.31	(297.07)
2028	6,553.23	13.21%	8.70%	865.54	-	865.54	569.99	(295.55)
2029	6,782.71	12.98%	8.67%	880.10	-	880.10	587.77	(292.33)
2030	7,022.28	12.85%	8.63%	902.70	-	902.70	606.36	(296.34)
2031	7,271.88	12.74%	8.61%	926.12	-	926.12	625.80	(300.33)
2032	7,532.39	12.61%	8.58%	949.67	-	949.67	646.12	(303.56)
2033	7,804.13	4.97%	8.56%	387.51	-	387.51	667.68	280.17
2034	8,087.28	3.67%	8.56%	297.12	-	297.12	692.58	395.47
2035	8,382.76	2.36%	8.59%	197.81	-	197.81	720.06	522.25
2036	8,690.60	1.46%	8.61%	127.24	-	127.24	748.62	621.38
2037	9,010.83	1.08%	8.65%	97.34	-	97.34	779.46	682.12
2038	9,344.71	0.85%	8.71%	79.37	-	79.37	813.86	734.49
2039	9,693.54	0.75%	8.77%	72.77	-	72.77	850.20	777.42
2040	10,057.93	0.72%	8.86%	72.66	-	72.66	891.37	818.72
2041	10,440.12	0.75%	8.99%	77.81	-	77.81	938.08	860.27
2042	10,842.35	0.80%	9.15%	86.79	-	86.79	992.13	905.34
2043	11,264.17	0.86%	9.42%	96.46	-	96.46	1,060.67	964.21
2044	11,704.70	0.93%	7.04%	109.28	-	109.28	824.44	715.16
2045	12,163.69	1.01%	4.53%	123.14	-	123.14	551.30	428.16
2046	12,640.67	1.08%	1.85%	136.75	-	136.75	234.08	97.33

* Indicates additional contributions from ELARF are added to this contribution rate to get the total contribution amount shown.

$ 15,914.73	$ 455.06	$ 16,369.78	$ 20,108.02	$ 3,738.23

This exhibit is an attachment to a letter that contains important information and explanations regarding the numbers shown. Therefore, the exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated January 19, 2015.
All assumptions, including the 8% investment return, are assumed to be met each year in the future.

1/19/2015

Exhibit B

Kansas Public Employee Retirement System
Comparison of State/School Group Funded Status Measures
Current Provisions vs. 8.65% for Last Half of FY15, 9.69% for FY16, 9.59% for FY17, Extending Amortization for 10 Years, $1.5B Bond Proceeds, No Additional Funding from Expanded Lottery Act Revenue Fund (ELARF)
(Dollar amounts in millions)

	Current Provisions				Alternate Provisions			
Valuation Date	Actuarial Liability	Actuarial Assets	Unfunded Actuarial Liability	Funded Ratio	Actuarial Liability	Actuarial Assets	Unfunded Actuarial Liability	Funded Ratio
12/31/2013	$ 17,078.13	$ 9,726.42	$ 7,351.70	57.0%	$ 17,078.13	$ 9,726.42	$ 7,351.70	57.0%
12/31/2014	17,783.41	10,473.40	7,310.01	58.9%	17,783.41	10,473.40	7,310.01	58.9%
12/31/2015	18,462.18	11,200.48	7,261.70	60.7%	18,462.18	12,635.28	5,826.89	68.4%
12/31/2016	19,111.31	12,105.39	7,005.92	63.3%	19,111.31	13,464.66	5,646.64	70.5%
12/31/2017	19,735.84	12,998.50	6,737.34	65.9%	19,735.84	14,206.78	5,529.06	72.0%
12/31/2018	20,337.87	13,764.98	6,572.90	67.7%	20,337.87	14,772.59	5,565.29	72.6%
12/31/2019	20,937.13	14,561.09	6,376.03	69.5%	20,937.13	15,334.68	5,602.45	73.2%
12/31/2020	21,528.52	15,374.70	6,153.82	71.4%	21,528.52	15,887.02	5,641.50	73.8%
12/31/2021	22,114.60	16,216.53	5,898.07	73.3%	22,114.60	16,439.57	5,675.03	74.3%
12/31/2022	22,701.02	17,100.20	5,600.82	75.3%	22,701.02	17,003.57	5,697.45	74.9%
12/31/2023	23,288.73	18,036.30	5,252.43	77.4%	23,288.73	17,582.56	5,706.18	75.5%
12/31/2024	23,881.04	19,026.87	4,854.17	79.7%	23,881.04	18,181.46	5,699.58	76.1%
12/31/2025	24,478.87	20,076.84	4,402.03	82.0%	24,478.87	18,803.19	5,675.68	76.8%
12/31/2026	25,085.06	21,134.99	3,950.07	84.3%	25,085.06	19,451.75	5,633.31	77.5%
12/31/2027	25,704.59	22,260.27	3,444.32	86.6%	25,704.59	20,134.46	5,570.14	78.3%
12/31/2028	26,339.22	23,456.75	2,882.48	89.1%	26,339.22	20,855.39	5,483.83	79.2%
12/31/2029	26,991.85	24,734.81	2,257.04	91.6%	26,991.85	21,619.51	5,372.34	80.1%
12/31/2030	27,678.56	26,106.63	1,571.93	94.3%	27,678.56	22,432.12	5,246.43	81.0%
12/31/2031	28,393.88	27,582.23	811.65	97.1%	28,393.88	23,300.03	5,093.85	82.1%
12/31/2032	29,139.65	28,870.28	269.37	99.1%	29,139.65	24,227.98	4,911.67	83.1%
12/31/2033	29,921.64	29,889.54	32.10	99.9%	29,921.64	25,225.84	4,695.79	84.3%
12/31/2034	30,744.24	30,864.34	(120.10)	100.4%	30,744.24	26,303.19	4,441.05	85.6%
12/31/2035	31,610.21	31,800.19	(189.99)	100.6%	31,610.21	27,467.45	4,142.75	86.9%
12/31/2036	32,522.27	32,728.76	(206.48)	100.6%	32,522.27	28,726.12	3,796.15	88.3%
12/31/2037	33,488.04	33,680.22	(192.17)	100.6%	33,488.04	30,092.92	3,395.12	89.9%
12/31/2038	34,513.89	34,669.99	(156.10)	100.5%	34,513.89	31,580.86	2,933.03	91.5%
12/31/2039	35,603.26	35,708.59	(105.33)	100.3%	35,603.26	33,201.27	2,401.99	93.3%
12/31/2040	36,769.86	36,813.53	(43.67)	100.1%	36,769.86	34,977.52	1,792.34	95.1%
12/31/2041	38,022.25	37,996.56	25.70	99.9%	38,022.25	36,930.55	1,091.70	97.1%
12/31/2042	39,365.81	39,264.21	101.61	99.7%	39,365.81	39,083.72	282.10	99.3%
12/31/2043	40,808.05	40,624.84	183.21	99.6%	40,808.05	41,304.99	(496.94)	101.2%

This exhibit is an attachment to a letter that contains important information and explanations regarding the numbers shown. Therefore, the exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated January 19, 2015.
All assumptions, including the 8% investment return, are assumed to be met each year in the future.

1/19/2015