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The experience and dedication you deserve

December 16, 2014

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

Re: Projected Valuation Results with Assumed Returns Other Than 8%

Dear Alan:

As you know, the actuarial valuation is based on an investment return assumption of 8%. The assumed rate of return is intended to be a long term "best estimate" of the compound return over a 30 to 50 year period. As such, we know that the actual investment returns will vary from year to year and over shorter measurement periods. At your request, we have prepared two projections to illustrate the impact of actual returns that are different than the 8% assumed rate. The two scenarios modeled are:

(1) Assume returns of 7% for the next 10 years and 8% thereafter,
(2) Assume a return of 7.5% for a 30 year period.

Cost Impact

We used the projection model prepared in conjunction with the December 31, 2013 actuarial valuation to compare future valuation results under the current, baseline scenario, which assumed an 8% return in each future year, and the two investment return scenarios outlined above. Exhibit A1 and A2 show the estimated State/School employer contribution rates and the corresponding dollar amounts of employer contributions under the current and proposed investment return scenarios. Exhibits B1 and B2 show the key valuation results for each valuation under both scenarios. If actual investment returns were below the 8% assumed rate or return, actuarial losses would occur and the actuarial contribution rate would increase in order to meet the funding goal of full funding by 2033 contribution rates. The following table summarizes the total employer contributions from 2015 through 2045:

Dollars are shown in millions.

Baseline	Alt 1 (7%/8%)	Difference	Alt 2 (7.5%)	Difference
$16,343.63	$18,710.74	$2,367.11	$19,802.23	$3,514.45

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 projections used in this cost study assume that all actuarial assumptions, other than the 8% investment return assumption, are met each year in the future. The investment returns assumed from 2015 through 2045 are as outlined earlier in this letter. The cost projections are sensitive to the assumptions used, particularly the investment return assumption. To the extent the actual investment returns are different than shown here, 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.

Disclaimers, Caveats, and Limitations

The numerical charts that comprise this study are based primarily upon the December 31, 2013 valuation results, the actuarial assumptions used in that valuation (other than as 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 as described 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.
- For the current scenario, projections reflect the statutory caps, i.e. 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. The alternate scenario is as described in this letter.
- 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 A1

8% Return All Years vs. 7% Return for 10 Years, 8% Thereafter

State/School Group

(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Employer Contribution Rate		Employer Contribution Amount ($M)		
Fiscal Year	Total Payroll	8% All Years	7% for 10 Year	8% All Years	7% for 10 Year	Difference
2015	$ 4,440.00	11.27%	11.27%	$ 500.39	500.39	$ -
2016	4,554.81	12.37% *	12.37% *	603.09	603.09	-
2017	4,663.16	13.57% *	13.57% *	673.35	673.35	-
2018	4,784.85	14.77% *	14.77% *	748.20	748.20	-
2019	4,918.20	14.83% *	14.95% *	772.01	777.92	5.90
2020	5,061.65	14.51% *	14.79% *	777.87	792.04	14.17
2021	5,215.15	14.19% *	14.69% *	784.31	810.39	26.08
2022	5,378.89	14.09% *	14.88% *	802.99	845.48	42.49
2023	5,552.28	13.96% *	15.09% *	826.85	889.59	62.74
2024	5,734.26	13.85% *	15.35% *	846.61	932.62	86.01
2025	5,925.05	13.72% *	15.64% *	866.70	980.46	113.76
2026	6,124.89	13.58%	15.97% *	886.59	978.22	91.63
2027	6,334.01	13.41%	16.34% *	905.22	1,034.96	129.74
2028	6,553.23	13.21%	16.69%	865.54	1,093.59	228.05
2029	6,782.71	12.98%	16.98%	880.10	1,151.41	271.31
2030	7,022.28	12.85%	17.15%	902.70	1,204.66	301.96
2031	7,271.88	12.74%	17.23%	926.12	1,252.63	326.51
2032	7,532.39	12.61%	17.33%	949.67	1,305.20	355.53
2033	7,804.13	4.97%	6.65%	387.51	518.62	131.11
2034	8,087.28	3.67%	4.89%	297.12	395.78	98.66
2035	8,382.76	2.36%	3.06%	197.81	256.49	58.68
2036	8,690.60	1.46%	1.79%	127.24	155.92	28.68
2037	9,010.83	1.08%	1.25%	97.34	112.66	15.32
2038	9,344.71	0.85%	0.91%	79.37	84.97	5.61
2039	9,693.54	0.75%	0.75%	72.77	72.77	-
2040	10,057.93	0.72%	0.70%	72.66	70.64	(2.01)
2041	10,440.12	0.75%	0.71%	77.81	73.64	(4.18)
2042	10,842.35	0.80%	0.75%	86.79	81.37	(5.42)
2043	11,264.17	0.86%	0.82%	96.46	91.95	(4.51)
2044	11,704.70	0.93%	0.88%	109.28	103.43	(5.85)
2045	12,163.69	1.01%	0.97%	123.14	118.28	(4.87)

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

Total	$ 16,343.63	$ 18,710.74	$ 2,367.11

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 December 16, 2014.
All assumptions are assumed to be met each year in the future.

12/16/2014

Exhibit A2

8% Return All Years vs. 7.5% Return All Years

State/School Group

(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Employer Contribution Rate		Employer Contribution Amount ($M)		
Fiscal Year	Total Payroll	8% All Years	7.5% All Years	8% All Years	7.5% All Years	Difference
2015	$ 4,440.00	11.27%	11.27%	$ 500.39	500.39	$ -
2016	4,554.81	12.37% *	12.37% *	603.09	603.09	-
2017	4,663.16	13.57% *	13.57% *	673.35	673.35	-
2018	4,784.85	14.77% *	14.77% *	748.20	748.20	-
2019	4,918.20	14.83% *	14.89% *	772.01	774.96	2.95
2020	5,061.65	14.51% *	14.65% *	777.87	784.96	7.09
2021	5,215.15	14.19% *	14.44% *	784.31	797.35	13.04
2022	5,378.89	14.09% *	14.49% *	802.99	824.51	21.52
2023	5,552.28	13.96% *	14.53% *	826.85	858.49	31.65
2024	5,734.26	13.85% *	14.61% *	846.61	890.19	43.58
2025	5,925.05	13.72% *	14.69% *	866.70	924.18	57.47
2026	6,124.89	13.58%	14.79% *	886.59	905.95	19.36
2027	6,334.01	13.41%	14.90%	849.37	943.75	94.38
2028	6,553.23	13.21%	15.03%	865.54	984.81	119.27
2029	6,782.71	12.98%	15.18%	880.10	1,029.32	149.22
2030	7,022.28	12.85%	15.35%	902.70	1,078.26	175.56
2031	7,271.88	12.74%	15.79%	926.12	1,147.92	221.79
2032	7,532.39	12.61%	16.40%	949.67	1,235.15	285.48
2033	7,804.13	4.97%	6.64%	387.51	517.84	130.33
2034	8,087.28	3.67%	5.28%	297.12	427.32	130.21
2035	8,382.76	2.36%	3.81%	197.81	319.36	121.55
2036	8,690.60	1.46%	2.85%	127.24	248.04	120.80
2037	9,010.83	1.08%	2.54%	97.34	228.90	131.56
2038	9,344.71	0.85%	2.40%	79.37	224.21	144.84
2039	9,693.54	0.75%	2.41%	72.77	233.69	160.91
2040	10,057.93	0.72%	2.50%	72.66	251.69	179.03
2041	10,440.12	0.75%	2.63%	77.81	274.09	196.27
2042	10,842.35	0.80%	2.77%	86.79	300.38	213.59
2043	11,264.17	0.86%	2.91%	96.46	327.37	230.92
2044	11,704.70	0.93%	3.05%	109.28	357.42	248.14
2045	12,163.69	1.01%	3.18%	123.14	387.09	263.95

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

Total	$ 16,287.78	$ 19,802.23	$ 3,514.45

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12/16/2014

Exhibit B1

Kansas Public Employee Retirement System
Comparison of State/School Group Funded Status Measures
8% Return All Years vs. 7% Return for 10 Years, 8% Thereafter
(Dollar amounts in millions)

	8% Return All Years				7% Return for 10 Years, 8% Thereafter			
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	10,452.65	7,330.76	58.8%
12/31/2015	18,462.18	11,200.48	7,261.70	60.7%	18,462.18	11,129.06	7,333.11	60.3%
12/31/2016	19,111.31	12,105.39	7,005.92	63.3%	19,111.31	11,951.43	7,159.88	62.5%
12/31/2017	19,735.84	12,998.50	6,737.34	65.9%	19,735.84	12,727.95	7,007.90	64.5%
12/31/2018	20,337.87	13,764.98	6,572.90	67.7%	20,337.87	13,344.42	6,993.46	65.6%
12/31/2019	20,937.13	14,561.09	6,376.03	69.5%	20,937.13	13,979.84	6,957.28	66.8%
12/31/2020	21,528.52	15,374.70	6,153.82	71.4%	21,528.52	14,623.91	6,904.61	67.9%
12/31/2021	22,114.60	16,216.53	5,898.07	73.3%	22,114.60	15,290.54	6,824.06	69.1%
12/31/2022	22,701.02	17,100.20	5,600.82	75.3%	22,701.02	15,996.94	6,704.07	70.5%
12/31/2023	23,288.73	18,036.30	5,252.43	77.4%	23,288.73	16,756.84	6,531.90	72.0%
12/31/2024	23,881.04	19,026.87	4,854.17	79.7%	23,881.04	17,608.45	6,272.60	73.7%
12/31/2025	24,478.87	20,076.84	4,402.03	82.0%	24,478.87	18,576.13	5,902.74	75.9%
12/31/2026	25,085.06	21,134.99	3,950.07	84.3%	25,085.06	19,675.11	5,409.95	78.4%
12/31/2027	25,704.59	22,260.27	3,444.32	86.6%	25,704.59	20,922.59	4,782.00	81.4%
12/31/2028	26,339.22	23,456.75	2,882.48	89.1%	26,339.22	22,271.12	4,068.11	84.6%
12/31/2029	26,991.85	24,734.81	2,257.04	91.6%	26,991.85	23,751.91	3,239.93	88.0%
12/31/2030	27,678.56	26,106.63	1,571.93	94.3%	27,678.56	25,371.42	2,307.14	91.7%
12/31/2031	28,393.88	27,582.23	811.65	97.1%	28,393.88	27,142.31	1,251.57	95.6%
12/31/2032	29,139.65	28,870.28	269.37	99.1%	29,139.65	28,650.09	489.57	98.3%
12/31/2033	29,921.64	29,889.54	32.10	99.9%	29,921.64	29,771.42	150.22	99.5%
12/31/2034	30,744.24	30,864.34	(120.10)	100.4%	30,744.24	30,818.90	(74.66)	100.2%
12/31/2035	31,610.21	31,800.19	(189.99)	100.6%	31,610.21	31,796.78	(186.58)	100.6%
12/31/2036	32,522.27	32,728.76	(206.48)	100.6%	32,522.27	32,748.06	(225.79)	100.7%
12/31/2037	33,488.04	33,680.22	(192.17)	100.6%	33,488.04	33,712.03	(223.99)	100.7%
12/31/2038	34,513.89	34,669.99	(156.10)	100.5%	34,513.89	34,707.31	(193.42)	100.6%
12/31/2039	35,603.26	35,708.59	(105.33)	100.3%	35,603.26	35,747.87	(144.61)	100.4%
12/31/2040	36,769.86	36,813.53	(43.67)	100.1%	36,769.86	36,852.76	(82.91)	100.2%
12/31/2041	38,022.25	37,996.56	25.70	99.9%	38,022.25	38,033.95	(11.70)	100.0%
12/31/2042	39,365.81	39,264.21	101.61	99.7%	39,365.81	39,299.43	66.39	99.8%
12/31/2043	40,808.05	40,624.84	183.21	99.6%	40,808.05	40,657.51	150.54	99.6%

This exhibit is an attachment to a letter that contains important information and explanations regarding the numbers shown. Therefore, the exhib exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated December 16, 2014
All assumptions are assumed to be met each year in the future

Exhibit B2

Kansas Public Employee Retirement System
Comparison of State/School Group Funded Status Measures
8% Return All Years vs. 7.5% Return All Years
(Dollar amounts in millions)

	8% Return All Years				7.5% Return All Years			
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	10,463.03	7,320.38	58.8%
12/31/2015	18,462.18	11,200.48	7,261.70	60.7%	18,462.18	11,164.72	7,297.46	60.5%
12/31/2016	19,111.31	12,105.39	7,005.92	63.3%	19,111.31	12,028.17	7,083.13	62.9%
12/31/2017	19,735.84	12,998.50	6,737.34	65.9%	19,735.84	12,862.58	6,873.26	65.2%
12/31/2018	20,337.87	13,764.98	6,572.90	67.7%	20,337.87	13,553.33	6,784.54	66.6%
12/31/2019	20,937.13	14,561.09	6,376.03	69.5%	20,937.13	14,267.95	6,669.18	68.1%
12/31/2020	21,528.52	15,374.70	6,153.82	71.4%	21,528.52	14,995.12	6,533.40	69.7%
12/31/2021	22,114.60	16,216.53	5,898.07	73.3%	22,114.60	15,747.26	6,367.34	71.2%
12/31/2022	22,701.02	17,100.20	5,600.82	75.3%	22,701.02	16,539.71	6,161.31	72.9%
12/31/2023	23,288.73	18,036.30	5,252.43	77.4%	23,288.73	17,384.59	5,904.14	74.6%
12/31/2024	23,881.04	19,026.87	4,854.17	79.7%	23,881.04	18,285.69	5,595.35	76.6%
12/31/2025	24,478.87	20,076.84	4,402.03	82.0%	24,478.87	19,250.29	5,228.58	78.6%
12/31/2026	25,085.06	21,134.99	3,950.07	84.3%	25,085.06	20,287.40	4,797.65	80.9%
12/31/2027	25,704.59	22,260.27	3,444.32	86.6%	25,704.59	21,351.31	4,353.28	83.1%
12/31/2028	26,339.22	23,456.75	2,882.48	89.1%	26,339.22	22,504.44	3,834.79	85.4%
12/31/2029	26,991.85	24,734.81	2,257.04	91.6%	26,991.85	23,759.10	3,232.75	88.0%
12/31/2030	27,678.56	26,106.63	1,571.93	94.3%	27,678.56	25,136.88	2,541.67	90.8%
12/31/2031	28,393.88	27,582.23	811.65	97.1%	28,393.88	26,669.09	1,724.79	93.9%
12/31/2032	29,139.65	28,870.28	269.37	99.1%	29,139.65	27,965.54	1,174.11	96.0%
12/31/2033	29,921.64	29,889.54	32.10	99.9%	29,921.64	28,904.47	1,017.17	96.6%
12/31/2034	30,744.24	30,864.34	(120.10)	100.4%	30,744.24	29,781.10	963.14	96.9%
12/31/2035	31,610.21	31,800.19	(189.99)	100.6%	31,610.21	30,599.62	1,010.59	96.8%
12/31/2036	32,522.27	32,728.76	(206.48)	100.6%	32,522.27	31,400.92	1,121.35	96.6%
12/31/2037	33,488.04	33,680.22	(192.17)	100.6%	33,488.04	32,222.45	1,265.60	96.2%
12/31/2038	34,513.89	34,669.99	(156.10)	100.5%	34,513.89	33,082.45	1,431.44	95.9%
12/31/2039	35,603.26	35,708.59	(105.33)	100.3%	35,603.26	33,994.01	1,609.25	95.5%
12/31/2040	36,769.86	36,813.53	(43.67)	100.1%	36,769.86	34,975.36	1,794.50	95.1%
12/31/2041	38,022.25	37,996.56	25.70	99.9%	38,022.25	36,037.87	1,984.38	94.8%
12/31/2042	39,365.81	39,264.21	101.61	99.7%	39,365.81	37,188.06	2,177.75	94.5%
12/31/2043	40,808.05	40,624.84	183.21	99.6%	40,808.05	38,434.08	2,373.96	94.2%

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exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated December 16, 2014
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12/16/2014