



# Cavanaugh Macdonald

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June 14, 2012

Mr. Alan Conroy  
Executive Director  
Kansas Public Employees Retirement System  
611 South Kansas Avenue, Suite 100  
Topeka, KS 66603

**Re: Cost Projections Under Current Plan and Senate Substitute for HB 2333**

Dear Alan:

As you requested, we have prepared a cost study to compare the estimated employer costs under the current benefit structure for KPERS with those of Senate Substitute for HB 2333 (Sub HB 2333) as passed by the 2012 Legislature. For purposes of the cost projections for Sub HB 2333, the effective date of the new plan design, Tier 3, is January 1, 2015. All employees hired on or after that date become members of KPERS Tier 3 with the exception of security officers who will continue to be covered under Tier 2. Active members of KPERS on January 1, 2015 remain members of Tier 1 or 2. Certain plan changes for Tiers 1 and 2 would be effective before January 1, 2015 (discussed later in this letter).

The current plan design is a traditional, final average pay defined benefit plan. Sub HB 2333, however, establishes a cash balance plan. While it is still a defined benefit plan, a cash balance plan provides a different benefit accrual pattern over a member's working career than a final average pay defined benefit plan. The cash balance plan is funded by both employer and employee contributions.

**Plan Provisions Under Sub HB 2333**

A brief summary of the cash balance plan provisions for Tier 3, found in Sub HB 2333, are outlined below:

- The employer credit to the cash balance account is a service based schedule as shown below:

Years of Service	Employer credit
Less than 5	3%
5 but less than 12	4%
12 but less than 24	5%
24 or more	6%

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- The guaranteed interest credit is 5.25% per year with interest credited to the account balance quarterly. Additional interest credits (dividends), not to exceed 4% per annum, may be granted at the discretion of the KPERS Board of Directors subject to certain conditions. If the total funded ratio of the system is less than 80%, the dividend shall be payable totally at the Board's discretion taking into account the funding of the system, market conditions, investment returns, and other related factors as specified by the Board. If the funded ratio of the system as a whole is equal to or more than 80%, the Board must grant a dividend which cannot exceed the lesser of 4% or a percentage, equal to the funded ratio of the system, multiplied by the rate of return on the system's assets that is above 8% for the fiscal year. The dividend shall not be granted unless the rate of return on KPERS' assets is at least 10% for that fiscal year.
- Employee contribution rate is 6% of pay.
- 100% vesting after five (5) years of service.
- Normal retirement date is the earlier of age 60 with 30 years of service or age 65 with 5 years of service.
- Early retirement eligibility is age 55 with 10 years of service.
- Upon termination of employment, a vested member may withdraw their employee account balance, but will forfeit any future benefit payable from the system. If the member leaves their employee contributions in the System, they may retire upon reaching early or normal retirement age with a benefit based on the total account value (employee and employer).
- When the member retires at normal retirement age, the member can elect to receive a lump sum of any fixed dollar amount or percent, not to exceed 30% of the total account balance (employee and employer accounts). The remaining balance must be converted to a monthly benefit, based on the form of payment selected by the member. The annuity amount is determined by the annuity conversion factors which are based on a 6% interest rate and a mortality table selected by the Board. No partial lump sum option is available if the member retires at his early retirement age.
- If a member dies prior to reaching the normal retirement age of 65, no benefit is payable other than the employee contributions and interest credits and the employer credit account balance is forfeited unless (i) the member is vested; (ii) the member has at least five (5) years of service at death; and (iii) the member's spouse at the time of death is designated as the sole primary beneficiary. In that case, the spouse shall receive a benefit based on the total account value (employee and employer) payable as a single life annuity with ten years certain, commencing when the member would have reached his normal retirement age.
- If a member becomes disabled while actively working, such member shall be given participating service credit for the entire period of his disability. Such member's account shall be credited with both the employee contribution and the employer credit until the earliest of (i) death; (ii) attainment of normal retirement age; or (iii) the date the member is no longer entitled to receive disability benefits.
- A benefit of \$4,000 is payable upon a retired member's death.

Sub HB 2333 also includes certain changes for members of Tier 1 and Tier 2. Subject to IRS approval of the election, Tier 1 members will be given the option to: (1) increase the employee contribution rate from 4% to 5%, effective January 1, 2014, and then to 6%, effective January 1, 2015, and receive a benefit multiplier of 1.85% on future years of service or (2) remain at a 4% employee contribution rate and receive a benefit multiplier of 1.4% for all future years of service. The default election is option (1). The benefit multiplier for Tier 2 members retiring on or after January 1, 2014, increases from 1.75% to 1.85% for all years of service and the cost of living adjustment (COLA) is eliminated for members who retire



after July 1, 2012. The projections for Sub HB 2333 shown in the attached exhibits reflect the default benefit provision changes for KPERS Tier 1 members.

### **Statutory Contribution Cap**

In KPERS, the employers do not necessarily contribute the full actuarial contribution rate. Based on legislation passed in 1993, the employer contribution rates certified by the Board may not increase by more than the statutory cap. The current statutory cap, which has been changed periodically, is 0.60% for the State, School and Local groups. Sub HB 2333 increases the statutory cap over a four year period beginning with 0.9% in FY 2014 and reaching an ultimate cap of 1.2% in FY 2017.

### **Actuarial Assumptions and Methods**

In general, the same actuarial methods and assumptions that were used in the December 31, 2010 actuarial valuation were used in the attached cost projections unless otherwise noted in this letter.

The projection of future benefit amounts for Tier 3 members under Sub HB 2333 requires the use of two additional assumptions that are not necessary in the valuation of projected benefits for Tier 1 and 2 members. They are the:

- interest crediting rate (applied to the account balance each year prior to retirement) and
- annuity conversion factors (which require a postretirement interest rate and a mortality assumption).

### ***Interest Crediting Rate***

The guaranteed interest crediting rate under Sub HB 2333 is 5.25%, but additional interest credits (called dividends) may be granted at the discretion of the KPERS Board of Directors, subject to certain conditions. If the total funded ratio of the system is less than 80%, the dividend shall be payable totally at the Board's discretion taking into account the funding of the system, market conditions, investment returns, and other related factors specified by the Board, with a maximum dividend of 4%. If the funded ratio of the system as a whole is equal to or more than 80%, the Board must grant a dividend which cannot exceed the lesser of 4% or a percentage, equal to the funded ratio of the system multiplied by the rate of return on the system's assets that is above 8% for the fiscal year. In all cases, the dividend shall not be granted unless the rate of return on KPERS assets is at least 10% for that fiscal year.

Although the assumed rate of return on KPERS' assets is 8% per annum, investment returns are expected to vary from year to year. Given the plan design and the standard deviation of the portfolio, the actual interest crediting rate (including dividends) is expected to be higher than the 5.25% guaranteed interest crediting rate. Therefore, an assumption is needed to anticipate the effective interest crediting rate over the projection period. Based on our analysis, if the system's funded ratio is 80% to 100%, the expected dividend rate would be around 1.75%, resulting in a total interest crediting rate of 7%. However, under current projections, an 80% funded ratio for the system, as a whole, is not projected to occur until about 2030, and so we expect that the effective dividend rate will be lower than 7% in the short term. The total interest crediting rate assumption used in the cost projections for Sub HB 2333 is 5.5% from 2015 through 2022, 6.0% from 2023 through 2030 and 7.0% thereafter. It is important to note that since the KPERS Board is able to exercise some degree of discretion in setting dividends, our analysis may need to be revised at a later date if the Board establishes a policy for setting dividends (either formally or informally) that is significantly different from that anticipated by the assumption used in these projections.

### ***Annuity Conversion Factors***

The annuity conversion factors are used to convert the account balance under Sub HB 2333 into monthly benefit amounts at retirement. The factors are based on an interest rate and mortality assumption. The interest rate to be used for the annuity conversion factors is specified as 6.0% as part of the plan design in Sub HB 2333. However, the legislation gives the Board of Trustees the authority to set the mortality table to be used for the conversion factors. Since the Board has not yet had time to set this assumption, we selected the RP 2000 Mortality Table projected to 2035, using Projection Scale AA, with a 50/50 male/female blend as the mortality assumption for this cost study. To the extent the Board elects to use a different mortality table, the actual costs may vary from those projected in this study.

### ***Other Assumptions***

All vested members under Sub HB 2333 are assumed to leave their employee account balance in the Cash Balance Plan when they terminate employment and receive benefits based on the total account value (employee and employer) at normal retirement age. In addition, the assumption for the portion of the retirement benefit that will be paid as a lump sum at retirement was 30% of the total account balance.

### ***Contributions from Expanded Lottery Act Revenue Fund***

Sub HB 2333 provides for additional contributions by the State to fund the unfunded actuarial liability (UAL) of the State/School Group until that group reaches a funded ratio of at least 80%. This additional contribution stream comes from the expanded lottery act revenue fund (ELARF) and is determined as 50% of the money credited to the ELARF, after a reduction of \$10.5 million (the reduction is only through FY 2022). Due to the variable nature of the source of these contributions, the specific amounts are unknown at this point in time. Based on guidance from KPERS, it was assumed that the total ELARF revenue would be \$87.72 million for FY 2013 increasing 1% per year thereafter. Based on this assumption, the expected contributions from the ELARF are shown in the table below. The additional State contribution is denoted with an asterisk on Exhibit A1.

Additional State		Additional State	
Fiscal Year	Contribution	Fiscal Year	Contribution
2014	\$39.05	2021	\$42.24
2015	39.49	2022	42.72
2016	39.94	2023	48.45
2017	40.39	2024	48.93
2018	40.85	2025	49.42
2019	41.31	2026	49.92
2020	41.77		

To the extent the actual amounts contributed by the State vary from the estimated amounts used in these projections, the valuation results will also vary from those in the attached cost projections.



### ***Amortization period***

The amortization period used in this cost study remained at a closed 22 year period starting on December 31, 2010. In order to mitigate the impact of the time lag between the valuation date and the fiscal year in which the contribution rate is effective, the amortization period was set to an open ten year period in 2030 for all projections.

### ***Funding Methodology***

As mentioned earlier, the benefit design for Tier 3 is a cash balance plan, which is still a defined benefit plan. Sub HB 2333 provides that the new tier will be combined with the existing KPERS Tiers 1 and 2 in one system with one trust. The actuarial valuation will reflect the future benefit payments for Tier 3 members along with those for Tier 1 and 2 members. One overall contribution rate (including the unfunded actuarial liability payment) that is to be paid on all covered payroll (Tier 1, Tier 2 and Tier 3 members) will be developed, by KPERS group - i.e. separate employer contribution rates will continue to be determined for the State/School group (all Tiers) and the Local group (all Tiers). Therefore, from an actuarial perspective, the valuation process is unchanged other than reflecting the new benefit structure for Tier 3 members.

### **Results**

The cost impact of Sub HB 2333 will unfold over time as current Tier 1 and Tier 2 members leave covered employment and are replaced by Tier 3 members. Therefore, a projection of employer costs over a long period of time is necessary in order to see the ultimate impact of the new plan design. The employer cost estimates under the current plan and Sub HB 2333 are reflected in the attached exhibits. Exhibits A1 and A2 show the estimated employer contribution rate and corresponding dollar amounts of employer contributions under each plan design by year for the State/School and Local groups. Exhibits B1 and B2 show the split of projected employer contributions into normal cost and UAL payments by year and in total. The projections assume that all actuarial assumptions, including the 8% investment return assumption, are met in the future. To the extent this assumption is not met in the future, the cost projections in this cost study are also expected to change. 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. In order to provide a method for more direct comparison of results, the present value of the total employer contributions using an 8% discount rate has been included at the bottom of Exhibits A1 and A2. The employer contribution rate also provides a reliable way to compare the cost of different plan designs many years into the future.

The cost projections attached to this letter are based on one set of actuarial assumptions, which include an 8% assumed rate of investment return. The cost projections are sensitive to the assumptions used, particularly the investment return assumption. However, the impact of different assumptions may vary for different plan designs. Further analysis can be provided upon request if it is deemed to be necessary or helpful.

It should also be noted that the different plan designs do not provide the same amount of retirement benefits to all members of the system. This, in turn, has an impact on the cost of the plan designs. Therefore, the cost projections should not be evaluated in isolation from the benefit amounts provided by the plan design.



### **Disclaimers, Caveats, and Limitations**

The numerical charts that comprise this study are based primarily upon the December 31, 2010 valuation results, the actuarial assumptions used in the 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 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).
- Changes in the plan design and resulting benefit amounts may have an effect on future termination and retirement patterns. Whether, and how, retirement and termination of employment patterns will ultimately be impacted cannot be known at this time. Therefore, no change in those assumptions was reflected in our modeling results.
- 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.
- Plan provisions for Tiers 1 and 2 are modified as disclosed earlier in this letter. Tier 3 benefits are as provided under Sub HB 2333 as described earlier in this letter. There are no other benefit changes reflected in future years.
- 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.
- The projections for the current plan reflect the current statutory cap for the increase in the employer contribution rate (0.60%). Projections for Sub HB 2333 reflect the statutory caps for the State/School and Local employers 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.
- 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, 2010, 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.

Mr. Alan Conroy  
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We, Patrice A. Beckham, FSA and Brent A. Banister, FSA, are consulting actuaries with Cavanaugh Macdonald Consulting, LLC. We are members of the American Academy of Actuaries, 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 any questions or additional information is needed, please let us know. We are available to provide additional analysis or explanation.

Sincerely,

A handwritten signature in cursive script that reads "Patrice Beckham".

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

A handwritten signature in cursive script that reads "Brent A. Banister".

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

# Exhibit A1

## Current Plan vs. Sub HB 2333 State/School Group

(1)	(2)	(3) Employer Contribution Rate		(5)	(6)	(7)	(8)
Fiscal Year	Total Payroll	Current Plan	Sub HB 2333	Current Plan	Sub HB 2333	Difference	Present Value of Difference
2012	\$ 4,465.19	8.77%	8.77%	\$ 391.60	\$ 391.60	\$ -	\$ -
2013	4,609.30	9.37%	9.37%	431.89	431.89	-	-
2014	4,742.86	9.97%	10.27% *	472.86	526.14	53.28	43.95
2015	4,889.77	10.57%	11.27% *	516.85	590.57	73.72	56.31
2016	5,048.36	11.17%	12.37% *	563.90	664.42	100.52	71.10
2017	5,217.25	11.77%	13.57% *	614.07	748.37	134.30	87.95
2018	5,396.09	12.37%	14.53% *	667.50	824.83	157.34	95.41
2019	5,585.80	12.97%	14.69% *	724.48	861.89	137.41	77.15
2020	5,786.83	13.57%	14.78% *	785.27	897.03	111.76	58.10
2021	5,999.32	14.17%	14.78% *	850.10	928.68	78.57	37.82
2022	6,223.41	14.77%	14.71% *	919.20	957.97	38.77	17.28
2023	6,458.61	15.37%	14.62% *	992.69	992.55	(0.13)	(0.06)
2024	6,704.71	15.97%	14.50% *	1,070.74	1,021.05	(49.70)	(18.99)
2025	6,962.16	16.57%	14.36% *	1,153.63	1,049.08	(104.55)	(36.99)
2026	7,231.45	17.17%	14.21% *	1,241.64	1,077.67	(163.97)	(53.72)
2027	7,512.93	17.77%	14.04%	1,335.05	1,054.89	(280.16)	(84.98)
2028	7,806.93	18.37%	13.86%	1,434.13	1,082.25	(351.88)	(98.83)
2029	8,113.92	18.97%	13.65%	1,539.21	1,107.82	(431.39)	(112.19)
2030	8,433.95	19.57%	13.41%	1,650.52	1,130.87	(519.65)	(125.13)
2031	8,767.29	20.02%	13.25%	1,754.82	1,161.56	(593.26)	(132.28)
2032	9,114.66	20.30%	13.06%	1,850.07	1,190.59	(659.48)	(136.15)
2033	9,476.23	8.42%	5.45%	798.29	516.55	(281.73)	(53.86)
2034	9,852.28	6.45%	4.16%	635.43	409.94	(225.49)	(39.91)
2035	10,243.64	4.34%	2.82%	444.71	289.18	(155.54)	(25.49)
2036	10,650.79	2.86%	1.92%	305.06	204.21	(100.85)	(15.30)
2037	11,073.56	2.18%	1.51%	241.18	167.58	(73.60)	(10.34)
2038	11,513.15	1.71%	1.27%	197.14	146.06	(51.08)	(6.65)
2039	11,970.93	1.45%	1.15%	173.63	137.23	(36.40)	(4.38)
2040	12,448.09	1.32%	1.11%	164.11	138.72	(25.39)	(2.83)
2041	12,947.04	1.25%	1.11%	161.49	144.13	(17.36)	(1.79)
2042	13,469.39	1.21%	1.13%	162.68	152.39	(10.29)	(0.98)
2043	14,014.53	1.21%	1.17%	169.46	164.04	(5.42)	(0.48)
2044	14,581.39	1.22%	1.21%	178.13	176.41	(1.72)	(0.14)
2045	15,170.09	1.25%	1.25%	189.27	189.42	0.14	0.01
2046	15,780.74	1.27%	1.30%	199.69	204.76	5.07	0.36
2047	16,410.26	1.29%	1.35%	212.47	220.88	8.41	0.55
2048	17,057.88	1.33%	1.38%	226.08	236.19	10.11	0.61
2049	17,727.69	1.37%	1.41%	242.33	250.62	8.29	0.46
2050	18,423.67	1.40%	1.45%	257.94	267.84	9.91	0.51
2051	19,147.45	1.43%	1.47%	274.67	282.18	7.51	0.36
2052	19,899.69	1.46%	1.51%	290.35	300.96	10.61	0.47
2053	20,682.16	1.48%	1.53%	306.64	316.47	9.83	0.40
2054	21,496.61	1.52%	1.55%	325.87	332.48	6.61	0.25
2055	22,344.49	1.55%	1.57%	346.12	351.29	5.17	0.18
2056	23,227.14	1.57%	1.58%	365.11	366.23	1.12	0.04
2057	24,145.92	1.59%	1.59%	384.89	383.98	(0.91)	(0.03)
2058	25,102.38	1.62%	1.58%	405.53	397.35	(8.18)	(0.23)
2059	26,098.07	1.64%	1.58%	427.16	413.61	(13.55)	(0.35)
2060	27,134.62	1.65%	1.58%	447.09	427.72	(19.37)	(0.46)

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

Total	\$ 29,492.74	\$ 26,280.17	\$ (3,212.57)	\$ (413.27)
Present Value at 8% as of July 1, 2011	\$ 9,145.90	\$ 8,732.63	\$ (413.27)	

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 June 14, 2012.

All assumptions, including the 8% investment return, are assumed to be met each year in the future.

6/14/2012

## Exhibit A2



## Current Plan vs. Sub HB 2333

## Local Group

(1) Fiscal Year	(2) Total Payroll	(3) Employer Contribution Rate		(6) Employer Contribution Amount (\$M)			(8) Present Value of Difference
		Current Plan	Sub HB 2333	Current Plan	Sub HB 2333	Difference	
2012	\$ 1,678.75	7.34%	7.34%	\$ 123.22	\$ 123.22	\$ -	\$ -
2013	1,726.92	7.94%	7.94%	137.12	137.12	-	-
2014	1,777.74	8.54%	8.73%	151.82	155.11	3.29	2.72
2015	1,834.05	9.14%	9.21%	167.63	168.86	1.23	0.94
2016	1,893.42	9.74%	9.11%	184.42	172.57	(11.85)	(8.38)
2017	1,955.65	10.27%	9.15%	200.84	178.85	(21.99)	(14.40)
2018	2,020.46	10.34%	9.19%	208.92	185.67	(23.26)	(14.10)
2019	2,087.94	10.36%	9.23%	216.39	192.62	(23.77)	(13.34)
2020	2,158.09	10.33%	9.25%	222.95	199.71	(23.23)	(12.08)
2021	2,231.91	10.30%	9.30%	229.92	207.48	(22.44)	(10.80)
2022	2,309.17	10.27%	9.34%	237.26	215.70	(21.56)	(9.61)
2023	2,389.76	10.24%	9.39%	244.80	224.41	(20.38)	(8.41)
2024	2,474.65	10.22%	9.44%	252.82	233.68	(19.15)	(7.32)
2025	2,563.71	10.19%	9.49%	261.35	243.27	(18.08)	(6.40)
2026	2,656.71	10.17%	9.54%	270.10	253.42	(16.68)	(5.47)
2027	2,753.93	10.13%	9.59%	279.06	264.12	(14.93)	(4.53)
2028	2,856.33	10.10%	9.64%	288.56	275.49	(13.08)	(3.67)
2029	2,963.32	10.07%	9.69%	298.30	287.21	(11.09)	(2.88)
2030	3,075.51	10.03%	9.75%	308.59	299.90	(8.69)	(2.09)
2031	3,192.38	10.00%	9.82%	319.39	313.56	(5.83)	(1.30)
2032	3,313.68	4.62%	4.42%	153.05	146.58	(6.47)	(1.34)
2033	3,440.20	3.70%	3.55%	127.13	121.97	(5.16)	(0.99)
2034	3,571.81	2.73%	2.62%	97.67	93.50	(4.17)	(0.74)
2035	3,709.17	2.40%	2.33%	88.87	86.45	(2.42)	(0.40)
2036	3,851.93	2.15%	2.13%	82.80	82.20	(0.60)	(0.09)
2037	4,001.21	2.03%	2.04%	81.03	81.52	0.49	0.07
2038	4,157.18	1.92%	1.98%	79.95	82.37	2.42	0.31
2039	4,319.48	1.85%	1.95%	80.06	84.04	3.97	0.48
2040	4,488.52	1.80%	1.92%	80.61	86.15	5.54	0.62
2041	4,663.81	1.75%	1.90%	81.64	88.79	7.15	0.74
2042	4,846.82	1.71%	1.90%	82.75	92.00	9.25	0.88
2043	5,037.31	1.68%	1.88%	84.45	94.84	10.40	0.92
2044	5,235.49	1.65%	1.89%	86.26	98.80	12.54	1.03
2045	5,442.03	1.63%	1.88%	88.75	102.38	13.63	1.03
2046	5,656.91	1.61%	1.88%	90.88	106.08	15.20	1.07
2047	5,879.63	1.59%	1.88%	93.72	110.45	16.73	1.09
2048	6,110.89	1.58%	1.87%	96.77	114.37	17.60	1.06
2049	6,351.53	1.59%	1.87%	100.69	119.07	18.38	1.03
2050	6,602.17	1.58%	1.88%	104.26	123.95	19.70	1.02
2051	6,862.33	1.58%	1.88%	108.75	128.98	20.22	0.97
2052	7,132.79	1.58%	1.87%	112.82	133.44	20.62	0.91
2053	7,414.16	1.59%	1.87%	117.92	138.78	20.86	0.86
2054	7,707.23	1.59%	1.87%	122.58	144.30	21.72	0.82
2055	8,012.19	1.60%	1.86%	128.34	149.18	20.85	0.73
2056	8,329.45	1.60%	1.86%	133.58	154.98	21.40	0.70
2057	8,659.60	1.62%	1.85%	139.96	160.07	20.11	0.61
2058	9,003.17	1.62%	1.84%	145.81	165.28	19.47	0.54
2059	9,360.70	1.63%	1.82%	152.89	170.60	17.71	0.46
2060	9,732.77	1.64%	1.80%	159.37	175.08	15.71	0.38
Total				\$ 7,706.82	\$ 7,768.15	\$ 61.33	\$ (106.36)
Present Value at 8% as of July 1, 2011				\$ 2,356.20	\$ 2,249.83	\$ (106.36)	

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 June 14, 2012.

All assumptions, including the 8% investment return, are assumed to be met each year in the future.

6/14/2012

## Exhibit B1

**Kansas Public Employee Retirement System**  
**Comparison of State/School Group Employer Contributions for Retirement Benefits**  
**Current Plan vs. Sub HB 2333**



FYE	Payroll (\$M)		Current Plan					Sub HB 2333 <sup>(1)</sup>					Difference <sup>(2)</sup>	Present Value of Difference		
			Employer Contribution	Employer Normal	Employer Normal	UAL	Total Employer	Employer Contribution	Employer Normal	Employer Normal	UAL	Total Employer				
	Rate	Cost Rate	Cost <sup>(2)</sup>	Payment <sup>(2)</sup>	Cost <sup>(2)</sup>	Rate	Cost Rate	Cost <sup>(2)</sup>	Payment <sup>(2)</sup>	Cost <sup>(2)</sup>						
2012	\$4,465.186	\$0.000	8.77%	3.86%	\$172.189	\$219.408	\$391.597	8.77%	3.86%	\$172.189	\$219.408	\$391.597	\$0.000	\$0.000		
2013	4,609.301	0.000	9.37%	3.86%	177.746	254.146	431.892	9.37%	3.86%	177.746	254.146	431.892	0.000	0.000		
2014	4,742.859	0.000	9.97%	3.86%	182.896	289.967	472.863	10.27%	3.86%	182.896	343.244	526.140	53.277	43.952		
2015	4,889.765	0.000	10.57%	3.70%	180.932	335.917	516.848	11.27%	2.39%	116.757	473.811	590.568	73.720	56.312		
2016	4,854.540	193.818	11.17%	3.57%	180.299	383.603	563.902	12.37%	2.30%	116.250	548.171	664.421	100.519	71.096		
2017	4,646.391	570.857	11.77%	3.44%	179.594	434.476	614.070	13.57%	2.22%	115.631	632.741	748.371	134.301	87.953		
2018	4,462.394	993.692	12.37%	3.34%	179.982	487.514	667.496	14.53%	2.15%	115.950	708.883	824.833	157.337	95.406		
2019	4,293.585	1,292.219	12.97%	3.23%	180.256	544.223	724.479	14.69%	2.08%	116.214	745.678	861.892	137.413	77.153		
2020	4,135.140	1,651.690	13.57%	3.12%	180.472	604.800	785.273	14.78%	2.02%	116.860	780.173	897.034	111.761	58.102		
2021	3,984.520	2,014.800	14.17%	3.02%	181.376	668.728	850.104	14.78%	1.97%	117.919	810.757	928.675	78.572	37.822		
2022	3,844.295	2,379.114	14.77%	2.93%	182.035	737.162	919.198	14.71%	1.92%	119.278	838.693	957.971	38.773	17.282		
2023	3,711.899	2,746.716	15.37%	2.83%	183.023	809.666	992.689	14.62%	1.87%	120.632	871.922	992.554	(0.135)	(0.056)		
2024	3,582.147	3,122.564	15.97%	2.75%	184.481	886.261	1,070.742	14.50%	1.83%	122.627	898.420	1,021.047	(49.695)	(18.990)		
2025	3,455.139	3,507.017	16.57%	2.66%	185.488	968.141	1,153.629	14.36%	1.79%	124.515	924.566	1,049.080	(104.549)	(36.991)		
2026	3,329.590	3,901.863	17.17%	2.59%	187.295	1,054.346	1,241.641	14.21%	1.76%	127.433	950.233	1,077.666	(163.975)	(53.720)		
2027	3,206.270	4,306.655	17.77%	2.51%	188.848	1,146.198	1,335.047	14.04%	1.73%	130.048	924.841	1,054.889	(280.158)	(84.983)		
2028	3,087.407	4,719.521	18.37%	2.44%	190.794	1,243.339	1,434.133	13.86%	1.71%	133.711	948.542	1,082.253	(351.880)	(98.833)		
2029	2,972.067	5,141.850	18.97%	2.38%	192.980	1,346.230	1,539.210	13.65%	1.69%	137.398	970.424	1,107.822	(431.387)	(112.189)		
2030	2,857.929	5,576.017	19.57%	2.31%	195.205	1,455.319	1,650.523	13.41%	1.68%	141.573	989.302	1,130.875	(519.648)	(125.132)		
2031	2,743.972	6,023.318	20.02%	2.26%	197.747	1,557.071	1,754.818	13.25%	1.67%	146.308	1,015.252	1,161.560	(593.257)	(132.276)		
2032	2,629.854	6,484.803	20.30%	2.20%	200.318	1,649.753	1,850.070	13.06%	1.66%	151.519	1,039.071	1,190.590	(659.480)	(136.149)		
2033	2,514.776	6,961.455	8.42%	2.14%	203.180	595.107	798.287	5.45%	1.65%	156.458	360.097	516.554	(281.733)	(53.855)		
2034	2,398.410	7,453.867	6.45%	2.10%	206.858	428.574	635.432	4.16%	1.63%	162.647	247.292	409.939	(225.493)	(39.912)		
2035	2,280.985	7,962.650	4.34%	2.05%	210.132	234.579	444.711	2.82%	1.64%	168.301	120.875	289.176	(155.536)	(25.490)		
2036	2,161.838	8,488.954	2.86%	2.00%	213.468	91.597	305.064	1.92%	1.64%	174.392	29.822	204.215	(100.850)	(15.304)		
2037	2,039.104	9,034.460	2.18%	1.96%	216.818	24.362	241.180	1.51%	1.63%	180.871	(13.288)	167.582	(73.598)	(10.341)		
2038	1,913.860	9,599.292	1.71%	1.92%	221.313	(24.178)	197.135	1.27%	1.63%	187.505	(41.447)	146.057	(51.078)	(6.645)		
2039	1,787.000	10,183.929	1.45%	1.88%	225.105	(51.475)	173.630	1.15%	1.63%	194.693	(57.460)	137.232	(36.398)	(4.385)		
2040	1,659.295	10,788.797	1.32%	1.85%	230.086	(65.975)	164.111	1.11%	1.62%	202.208	(63.485)	138.722	(25.388)	(2.832)		
2041	1,535.006	11,412.033	1.25%	1.82%	235.285	(73.798)	161.487	1.11%	1.62%	210.157	(66.030)	144.127	(17.360)	(1.793)		
2042	1,417.239	12,052.155	1.21%	1.78%	239.454	(76.776)	162.679	1.13%	1.62%	218.392	(66.000)	152.392	(10.287)	(0.984)		
2043	1,303.795	12,710.735	1.21%	1.75%	245.142	(75.678)	169.463	1.17%	1.62%	227.110	(63.065)	164.045	(5.419)	(0.480)		
2044	1,191.638	13,389.752	1.22%	1.73%	252.500	(74.365)	178.135	1.21%	1.62%	236.197	(59.784)	176.414	(1.721)	(0.141)		
2045	1,079.932	14,090.157	1.25%	1.71%	259.054	(69.782)	189.272	1.25%	1.62%	245.545	(56.129)	189.415	0.144	0.011		
2046	968.915	14,811.829	1.27%	1.69%	265.971	(66.279)	199.691	1.30%	1.62%	255.260	(50.498)	204.762	5.070	0.356		
2047	854.725	15,555.537	1.29%	1.66%	273.188	(60.718)	212.470	1.35%	1.63%	266.833	(45.949)	220.884	8.414	0.548		
2048	735.997	16,321.880	1.33%	1.66%	282.375	(56.291)	226.084	1.38%	1.62%	277.130	(40.939)	236.192	10.107	0.609		
2049	617.567	17,110.126	1.37%	1.65%	291.965	(49.638)	242.328	1.41%	1.62%	287.844	(37.228)	250.616	8.288	0.462		
2050	505.102	17,918.563	1.40%	1.64%	302.152	(44.217)	257.936	1.45%	1.62%	299.164	(31.320)	267.844	9.908	0.512		
2051	406.776	18,740.676	1.43%	1.63%	312.962	(38.295)	274.667	1.47%	1.62%	310.899	(28.721)	282.178	7.510	0.359		
2052	324.630	19,575.064	1.46%	1.63%	324.179	(33.829)	290.350	1.51%	1.63%	324.835	(23.880)	300.956	10.606	0.470		
2053	254.934	20,427.222	1.48%	1.62%	335.598	(28.955)	306.643	1.53%	1.63%	337.152	(20.682)	316.470	9.827	0.403		
2054	195.226	21,301.383	1.52%	1.63%	349.514	(23.646)	325.867	1.55%	1.63%	349.680	(17.197)	332.482	6.615	0.251		
2055	146.939	22,197.549	1.55%	1.63%	363.993	(17.876)	346.118	1.57%	1.63%	364.696	(13.407)	351.290	5.172	0.182		
2056	110.935	23,116.200	1.57%	1.63%	379.045	(13.936)	365.109	1.58%	1.63%	377.843	(11.614)	366.229	1.121	0.036		
2057	83.578	24,062.346	1.59%	1.63%	394.549	(9.658)	384.891	1.59%	1.63%	393.641	(9.658)	383.983	(0.908)	(0.027)		
2058	62.021	25,040.360	1.62%	1.64%	410.552	(5.020)	405.532	1.58%	1.62%	407.393	(10.041)	397.352	(8.179)	(0.228)		
2059	45.588	26,052.485	1.64%	1.64%	427.158	0.000	427.158	1.58%	1.62%	424.050	(10.439)	413.611	(13.547)	(0.350)		
2060	33.775	27,100.844	1.65%	1.64%	444.379	2.713	447.093	1.58%	1.63%	441.289	(13.567)	427.722	(19.371)	(0.464)		
			\$11,999,930					\$17,492,814	\$29,492,744							
										</						

## Exhibit B2

**Kansas Public Employee Retirement System**  
**Comparison of Local Group Employer Contributions for Retirement Benefits**  
**Current Plan vs. Sub HB 2333**



Current Plan														Sub HB 2333 <sup>(1)</sup>														Difference <sup>(2)</sup>	Present Value of Difference
FYE	Payroll (\$M)		Employer Contribution	Employer Normal	Employer Normal	UAL	Total Employer	Employer Contribution	Employer Normal	Employer Normal	UAL	Total Employer	Difference	Present Value of Difference															
	Tier 1/2	Tier 3	Rate	Cost Rate	Cost <sup>(2)</sup>	Payment <sup>(2)</sup>	Cost <sup>(2)</sup>	Rate	Cost Rate	Cost <sup>(2)</sup>	Payment <sup>(2)</sup>	Cost <sup>(2)</sup>	Difference	Present Value of Difference															
2012	\$1,678.751	\$0.000	7.34%	3.48%	\$58.354	\$64.866	\$123.220	7.34%	3.48%	\$58.354	\$64.866	\$123.220	\$0.000	\$0.000															
2013	1,726.922	0.000	7.94%	3.48%	60.029	77.089	137.118	7.94%	3.48%	60.029	77.089	137.118	0.000	0.000															
2014	1,777.741	0.000	8.54%	3.32%	59.099	92.720	151.819	8.73%	2.03%	36.005	119.109	155.113	3.294	2.718															
2015	1,834.054	0.000	9.14%	3.18%	58.398	109.234	167.633	9.21%	1.94%	35.524	133.336	168.860	1.227	0.938															
2016	1,732.432	160.988	9.74%	3.05%	57.822	126.597	184.419	9.11%	1.85%	35.106	137.462	172.568	(11.851)	(8.382)															
2017	1,645.688	309.957	10.27%	2.95%	57.692	143.153	200.845	9.15%	1.82%	35.501	143.349	178.850	(21.995)	(14.404)															
2018	1,571.519	448.942	10.34%	2.85%	57.591	151.333	208.924	9.19%	1.78%	35.952	149.716	185.668	(23.255)	(14.102)															
2019	1,504.672	583.268	10.36%	2.75%	57.494	158.892	216.386	9.23%	1.75%	36.441	156.178	192.619	(23.767)	(13.344)															
2020	1,443.758	714.331	10.33%	2.66%	57.422	165.525	222.948	9.25%	1.71%	36.994	162.720	199.714	(23.234)	(12.079)															
2021	1,388.121	843.784	10.30%	2.57%	57.390	172.526	229.917	9.30%	1.69%	37.632	169.848	207.480	(22.437)	(10.800)															
2022	1,337.069	972.102	10.27%	2.48%	57.374	179.884	237.258	9.34%	1.66%	38.354	177.344	215.698	(21.560)	(9.610)															
2023	1,287.792	1,101.966	10.24%	2.40%	57.438	187.357	244.795	9.39%	1.64%	39.207	185.206	224.414	(20.382)	(8.411)															
2024	1,240.721	1,233.929	10.22%	2.33%	57.572	195.250	252.822	9.44%	1.62%	40.158	193.518	233.675	(19.146)	(7.316)															
2025	1,195.668	1,368.043	10.19%	2.25%	57.794	203.559	261.353	9.49%	1.61%	41.253	202.020	243.273	(18.080)	(6.397)															
2026	1,151.481	1,505.233	10.17%	2.19%	58.096	212.006	270.101	9.54%	1.60%	42.477	210.943	253.420	(16.682)	(5.465)															
2027	1,107.880	1,646.052	10.13%	2.12%	58.466	220.590	279.056	9.59%	1.59%	43.809	220.315	264.123	(14.933)	(4.530)															
2028	1,066.394	1,789.935	10.10%	2.06%	58.916	229.649	288.565	9.64%	1.58%	45.269	230.220	275.489	(13.075)	(3.672)															
2029	1,026.037	1,937.287	10.07%	2.01%	59.453	238.844	298.296	9.69%	1.58%	46.880	240.326	287.205	(11.091)	(2.884)															
2030	987.271	2,088.244	10.03%	1.95%	60.093	248.502	308.595	9.75%	1.58%	48.635	251.270	299.905	(8.690)	(2.093)															
2031	948.539	2,243.840	10.00%	1.90%	60.807	258.583	319.389	9.82%	1.58%	50.508	263.052	313.560	(5.829)	(1.300)															
2032	909.023	2,404.654	4.62%	1.86%	61.590	91.457	153.047	4.42%	1.58%	52.472	94.108	146.580	(6.467)	(1.335)															
2033	870.017	2,570.182	3.70%	1.82%	62.454	64.676	127.130	3.55%	1.59%	54.538	67.428	121.966	(5.164)	(0.987)															
2034	830.294	2,741.515	2.73%	1.77%	63.385	34.289	97.674	2.62%	1.59%	56.715	36.790	93.505	(4.170)	(0.738)															
2035	790.750	2,918.421	2.40%	1.74%	64.388	24.481	88.868	2.33%	1.59%	59.000	27.448	86.448	(2.421)	(0.397)															
2036	750.717	3,101.217	2.15%	1.70%	65.466	17.334	82.800	2.13%	1.59%	61.397	20.800	82.198	(0.602)	(0.091)															
2037	711.148	3,290.061	2.03%	1.67%	66.630	14.404	81.034	2.04%	1.60%	63.917	17.605	81.522	0.488	0.069															
2038	672.035	3,485.140	1.92%	1.63%	67.894	12.056	79.949	1.98%	1.60%	66.569	15.797	82.366	2.417	0.314															
2039	631.942	3,687.540	1.85%	1.60%	69.266	10.799	80.065	1.95%	1.61%	69.351	14.686	84.037	3.972	0.479															
2040	591.915	3,896.609	1.80%	1.58%	70.740	9.875	80.614	1.92%	1.61%	72.240	13.914	86.154	5.540	0.618															
2041	550.116	4,113.697	1.75%	1.55%	72.314	9.328	81.641	1.90%	1.61%	75.261	13.525	88.787	7.145	0.738															
2042	508.589	4,338.227	1.71%	1.53%	74.024	8.724	82.748	1.90%	1.62%	78.425	13.571	91.996	9.248	0.884															
2043	466.855	4,570.450	1.68%	1.51%	75.882	8.563	84.445	1.88%	1.62%	81.743	13.097	94.840	10.395	0.920															
2044	425.694	4,809.793	1.65%	1.49%	77.882	8.377	86.259	1.89%	1.63%	85.185	13.612	98.797	12.538	1.028															
2045	385.305	5,056.730	1.63%	1.47%	80.045	8.707	88.752	1.88%	1.63%	88.774	13.605	102.379	13.627	1.034															
2046	345.671	5,311.236	1.61%	1.46%	82.391	8.485	90.877	1.88%	1.64%	92.501	13.577	106.078	15.201	1.068															
2047	305.883	5,573.748	1.59%	1.44%	84.902	8.819	93.721	1.88%	1.64%	96.341	14.111	110.452	16.731	1.089															
2048	267.707	5,843.187	1.58%	1.43%	87.602	9.166	96.768	1.87%	1.64%	100.310	14.055	114.365	17.597	1.060															
2049	230.872	6,120.663	1.59%	1.43%	90.529	10.162	100.691	1.87%	1.64%	104.461	14.609	119.069	18.378	1.025															
2050	196.362	6,405.813	1.58%	1.42%	93.695	10.563	104.258	1.88%	1.65%	108.770	15.185	123.955	19.697	1.018															
2051	164.663	6,697.670	1.58%	1.41%	97.088	11.666	108.754	1.88%	1.65%	113.194	15.783	128.977	20.223	0.967															
2052	135.901	6,996.887	1.58%	1.41%	100.694	12.126	112.819	1.87%	1.65%	117.744	15.692	133.437	20.617	0.913															
2053	109.848	7,304.317	1.59%	1.41%	104.570	13.345	117.915	1.87%	1.65%	122.465	16.311	138.776	20.861	0.856															
2054	86.352	7,620.874	1.59%	1.41%	108.708	13.873	122.581	1.87%	1.65%	127.349	16.956	144.304	21.724	0.825															
2055	67.794	7,944.399	1.60%	1.41%	113.112	15.223	128.335	1.86%	1.65%	132.356	16.826	149.182	20.846	0.733															
2056	53.066	8,276.388	1.60%	1.41%	117.751	15.826	133.577	1.86%	1.65%	137.485	17.492	154.977	21.400	0.697															
2057	41.079	8,618.517	1.62%	1.42%	122.644	17.319	139.963	1.85%	1.65%	142.751	17.319	160.070	20.107	0.606															
2058	31.057	8,972.117	1.62%	1.42%	127.805	18.006	145.811	1.84%	1.65%	148.171	17.106	165.278	19.467	0.543															
2059	23.462	9,337.237	1.63%	1.42%	133.233	19.657	152.891	1.82%	1.64%	153.755	16.849	170.605	17.714	0.458															
2060	17.982	9,714.786	1.64%	1.43%	138.932	20.439	159.370	1.80%	1.64%	159.507	15.572	175.079	15.709	0.376															
			\$3,742.912					\$3,666.835					\$7,768.152		\$61.334	(\$106.363)													