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February 1, 2013

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

**Re: Cost Studies for Changes to the Tier 3 Cash Balance Plan**

Dear Alan:

Senate Substitute for HB 2333 (Sub HB 2333), which was passed by the 2012 Legislature, created a new benefit design for all employees hired on or after January 1, 2015. These members are referred to as Tier 3 members. The provisions of Sub HB 2333 include a guaranteed interest crediting rate of 5.25% and an annuity conversion rate of 6%. We have been asked to determine the cost impact of several potential changes to the Tier 3 plan design:

- (1) Reduce the guaranteed interest crediting rate to 4.25%
- (2) Reduce the annuity conversion interest rate to 5%
- (3) Reduce the guaranteed interest crediting rate to 4.25% and reduce the annuity conversion interest rate to 5%.

This letter and its attachments include a comparison of the estimated employer costs under the current provisions under Sub HB 2333 and each of the changes identified in the above paragraph. All other provisions of Sub HB 2333, including changes to the statutory cap on the employer contribution rate and the changes for Tier 1 and 2 members, are assumed to remain in place.

**Actuarial Assumptions and Methods**

In general, the same actuarial methods and assumptions that were used in the December 31, 2011 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 requires the use of an additional assumption that is unique to the KPERS Tier 3 Cash Balance Plan design. Given the variable nature of the interest crediting rate (the sum of the guaranteed interest crediting rate plus dividends), an assumption is needed to anticipate the long term average of the interest crediting rate. In addition, a mortality assumption for the annuity conversion rates is another assumption unique to the Cash Balance Plan.

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

The guaranteed interest crediting rate under Sub HB 2333 is 5.25% and two of the cost studies use a guaranteed interest crediting rate of 4.25%. However 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%, dividends granted by the Board 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 long-term 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 expected return and standard deviation of KPERS' portfolio, the actual interest crediting rate (including dividends) is expected to be higher than the guaranteed interest crediting rate. Therefore, an assumption is needed to anticipate the effective interest crediting rate over the duration of 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%. The dividend rate would remain 1.75% under the lower guaranteed interest crediting rate because the criteria for the dividend do not change. In other words, the total interest crediting rate is 7% when the guaranteed interest crediting rate is 5.25% and 6% when the guaranteed interest crediting rate is 4.25%. 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 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. For the studies where the guaranteed interest crediting rate is lowered to 4.25%, the interest crediting rate assumption is 4.5% from 2015 through 2022, 5.0% from 2023 through 2030 and 6.0% 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 revisited, and potentially revised for future valuations, once the Board has established a policy for granting dividends.

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

The annuity conversion factors, which are used to convert the Cash Balance account value into monthly benefit amounts at retirement, 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. The cost studies include two alternatives that assume the interest rate for annuity conversion will be lowered to 5.0%.

Sub HB 2333 gives the KPERS 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, it was necessary to make an assumption about the mortality table. The RP 2000 Mortality Table projected to 2035, using Projection Scale AA, with a 50/50 male/female blend was used for the annuity conversion factors in 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***

For all projections, all vested members 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 for Tier 3 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. The ELARF funds contributed to KPERS are the same under the Sub HB 2333 and three cost studies because the date at which the State/School group reaches 80% funded ratio does not change. The expected contributions from the ELARF are shown in the table below. The additional State contribution is denoted with an asterisk on Exhibits A1, A3, A5, and A7.

Fiscal Year	ELARF Funds	Fiscal Year	ELARF Funds
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	2027	50.42

To the extent the actual ELARF 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 projections.

### ***Amortization period***

The amortization period used in all of the cost studies remained at a closed 21 year period starting on December 31, 2011. 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***

The projection results reflect an actuarial valuation process with combined results for all three membership tiers. The valuation will report one overall contribution rate, including the unfunded actuarial liability payment, based on all covered payroll (Tier 1, Tier 2 and Tier 3 members) for each KPERS group. Separate employer contribution rates will continue to be determined for the State/School group (all Tiers combined) and the Local group (all Tiers combined).

### **Results**

The cost impact of the Cash Balance Plan 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 various Cash Balance plan designs. The employer cost estimates under Sub HB 2333 and the three alternate plan provisions, which vary the guaranteed interest crediting rate, the annuity conversion interest rate, and both the guaranteed interest crediting rate and the annuity conversion interest rate, are reflected in the attached exhibits. Exhibits A1 through A8 show the estimated employer contribution rate and corresponding dollar amounts of employer contributions under Sub HB 2333 and each alternative plan design by year for the State/School and Local groups. Exhibits B1 through B8 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 each year in the future. To the extent this assumption is not met in the future, the cost projections in these studies are 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 a more direct comparison of cost results, the present value of the total employer contributions, using an 8% discount rate, has been included at the bottom of Exhibits A1 through A8. The employer contribution rate also provides a reliable way to directly compare the cost of different plan designs many years in 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 changes in the plan provisions result in different benefit amounts to members of the system. This, in turn, has an impact on the cost of the various 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, 2011 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 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).
- Due to the changes in the plan design for Tier 3, retirement rates used in the valuation were changed to attempt to anticipate the retirement patterns in future years. Whether, and how, the retirement patterns will ultimately be impacted cannot be known at this time. While we believe the assumptions used are reasonable based on available information, actual experience may unfold differently than assumed. If so, it could have an impact on the costs of the plan designs.
- Changes in the plan design and resulting benefit amounts may have an effect on future termination patterns. Whether, and how, 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 Tier 3 benefits are as described earlier in this letter. There are no other changes from the provisions of Sub HB 2333 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.
- All projections reflect the statutory caps of Sub HB 2333, 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.
- 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, 2011, 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.

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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,

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Principal and Consulting Actuary

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Chief Pension Actuary