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February 5, 2013

Mr. Jim Pyle
Executive Director
Police Retirement System of Kansas City, Missouri
9701 Marion Park Drive, B
Kansas City, MO 64137

Re: Cost Study of the Impact of Senate Bill 215 and House Bill 418 on the Police Retirement System of Kansas City, Missouri

Dear Jim:

At your request, we have prepared a cost study to measure the impact of the revised pension plan design for the Police Retirement System of Kansas City, Missouri (System) in Senate Bill 215 (SB 215) and House Bill 418 (HB 418). The proposed changes for current members and new hires (those becoming members on or after August 28, 2013), along with increased contributions by the City and members, will strengthen the System's long term funding and improve the System's ability to meet its obligations in future years. The changes under SB 215/HB 418 result in an increasing funded ratio that rises to nearly 90% over the projection period, assuming all actuarial assumptions are met in the future. Without these changes, the funded ratio of the System is projected to decline to around 50% at the end of the projection period.

Provisions of SB 215/HB 418

The proposed pension changes in SB 215/HB 418 impact the benefits of current retirees, current actives, and future actives (new hires). In addition, in recent years the City has contributed a fixed contribution rate. As part of the pension changes in SB 215/HB 418 the City will make the full actuarial contribution rate in future years. This is a critical component in ensuring the long term financial health of the System.

Presently, the benefits received by retirees and beneficiaries include a supplemental benefit of \$420 per month. Under SB 215/HB 418, only \$220 per month of the supplemental benefit will be paid from the System for current retirees and beneficiaries and for current active members when they retire. The remaining \$200 per month will be paid directly by the City outside the System. As a result the amount of the supplemental benefit to be funded by the System reduces to \$220 per month, compared to \$420 per month in the current benefit structure. This change in benefits for current members results in an immediate reduction in the unfunded actuarial accrued liability and a decrease in the normal cost rate.

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The Board of Trustees currently has the authority to grant a cost of living adjustment (COLA) to retirees and beneficiaries depending upon the actuarial condition of the System. By law, the maximum adjustment each year is 3% of the base pension (the benefit amount initially paid at retirement). The valuation has historically assumed future ad hoc COLAs of 3% each year. For purposes of the actuarial projections for SB 215/HB 418, it was assumed that the average COLA in future years would be a 2.5% COLA. This was assumed for both current and future retirees. New hires are eligible for a simple COLA, but it does not start until the date the member would have worked 32 years. Several additional changes apply to the benefit structure for those becoming members on or after August 28, 2013. The following table compares the current key plan provisions and the proposed changes under SB 215/HB 418.

	Current Plan Provisions		SB 215/HB 418 Provisions	
			<u>Current Actives</u>	<u>Future Hires (Tier II)</u>
Service Retirement	Age 60 with 10 Years Service or 25 Years of Service. Mandatory retirement at 32 Years or Age 65 if later.		No change except mandatory retirement at 35 Years or Age 65 if later.	Age 60 with 15 Years of Service or 27 Years of Service. Mandatory retirement at 35 Years
Benefit Formula	2.5% times years of service, not to exceed 75%		2.5% times years of service, not to exceed 80%	2.5% times years of service, not to exceed 80%
Final Compensation	Average of highest two years		No change	Average of highest three years
Form of Payment	Joint and 80% survivor benefit, if married. Life only if single.		No change	Joint and 50% survivor benefit, if married, Life only if single.
Cost of Living	At Board's discretion based on actuarial condition of the system, but not to exceed a 3% simple COLA.		No change	At Board's discretion based on actuarial condition of System. If the member retires with less than 32 years of service, the COLA is deferred to point at which the member would have reached 32 years of service.
Supplemental Benefit	\$420 per month		\$220 per month*	None
Member Contributions	10.55%		11.55%	11.55%
City Contributions	19.70% of covered payroll		Actuarial contribution rate as determined by the System's actuary	Actuarial contribution rate as determined by the System's actuary

*Also applies to current retirees and beneficiaries.



Actuarial Assumptions

When discussions about the retirement system’s funding began, the most recent actuarial valuation was the April 30, 2011 valuation. As a result, that is the actuarial valuation that was used to analyze various proposals related to improving the System’s long term funding. The City also requested that a consistent investment return assumption of 7.5% be used in the plan design studies for all four retirement systems that cover the City’s employees. As a result, the April 30, 2011 valuation was revised to reflect a 7.5% investment return assumption rather than the valuation rate of 7.75% and projections of different plan designs were based on that assumption. The remaining actuarial assumptions that were used in the actuarial projections of funded status are the same as those used in the April 30, 2011 actuarial valuation with the exception of the cost of living adjustment (COLA) assumption. Part of the revised plan design is for the cost of living adjustments granted by the Board to average 2.5% over the next thirty years. As a result, the 3.0% COLA assumption used in the valuation was changed for the SB 215/HB 418 projections to reflect a 2.5% cost of living adjustment assumption.

	<u>Original Valuation Actuarial Assumptions</u>	<u>New Actuarial Assumptions Used in Cost Studies</u>
Assumed Rate of Return	7.75%	7.50%
Assumed Ad Hoc Cost of Living Adjustment	3.0%	2.5% for SB 215/HB 418*
Amortization Period	Closed 24 Years	Open 30 Years

* See paragraph above for further clarification on the cost of living adjustment assumption.

Please see the Appendix, attached to this letter, for a detailed listing of all of the assumptions used in the various projections attached to this letter. In our opinion, the assumptions used in the actuarial projections produce results which, in the aggregate, are reasonable. However, 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

Actuarial Methods

The entry age normal actuarial cost method, which is the cost method used in the annual actuarial valuation, was also used in the actuarial projections of the current plan and SB 215/HB 418. Although the System uses an asset smoothing method in the regular valuation, for purposes of all of the actuarial projections, the pure market value of assets was used as asset smoothing has little impact on results of a thirty year projection. Please see the Appendix for a full explanation of the actuarial methods used in the actuarial projections.

Amortization of Unfunded Actuarial Liability

In the annual actuarial valuation, a separate amortization base is created each year based on the difference between the actual unfunded actuarial liability and the expected unfunded actuarial liability. That base is then amortized over a closed 24 year period, with payments determined as a level percent of payroll. For purposes of plan design analysis projections, an open thirty year amortization period was used. The unfunded actuarial liability payment was determined as a level percent of payroll. Please see the Appendix for more detailed information on the amortization of the unfunded actuarial liability.



Actuarial Analysis

Because a different set of assumptions other than the valuation assumptions was used for the actuarial projections in the plan design study, a number of projection results are provided with this letter to illustrate the impact of the assumption changes and to enable a more direct comparison of different results. In addition, the City has been contributing at a fixed contribution rate, but will move to contributing the full actuarial contribution rate under SB 215/HB 418. Therefore an exhibit is provided to illustrate the impact of the City continuing the current practice compared to contributing the full actuarial contribution rate.

The following exhibits are attached to this letter. Each provides detailed information on the projected valuation results in future years including funded ratio, unfunded actuarial accrued liability, normal cost rate, unfunded actuarial contribution rate, total actuarial contribution rate, member contribution rate, and employer actuarial required contribution rate (ARC), assuming all actuarial assumptions are met (whichever set of assumptions is used to develop the liabilities). The exhibits are:

- Exhibit A: Current Plan Provisions, Original Assumptions, City Contributes 19.7%
- Exhibit B: Current Plan Provisions, Original Assumptions, City Contributes ARC
- Exhibit C: Current Plan Provisions, New Assumptions, City Contributes ARC
- Exhibit D: New Plan Provisions (SB 215/HB 418), Original Assumptions, City Contributes ARC
- Exhibit E: New Plan Provisions (SB 215/HB 418), New Assumptions, City Contributes ARC

For purposes of the description of assumptions used in the above exhibits, the set of assumptions and methods are as follows:

	Original Assumptions	New Assumptions
Investment Return	7.75%	7.5%
Amortization Policy		
Period	24 years	30 years
Open or Closed	Closed	Open
One base or multiple	Multiple bases	One base
Level dollar or Level Percent of Payroll	Level percent of payroll	Level percent of payroll
Cost of Living	3.0%	2.5% for SB 215/HB 418
Asset value	Market value	Market value
Actuarial Cost Method	Entry age	Entry age

The changes to the benefit and contribution provisions of the System for current members (retirees and current actives) will have an immediate impact on the valuation results upon implementation, reducing both the unfunded actuarial liability and the normal cost rate. The following table summarizes the estimated impact of the changes in the benefits and contributions in SB 215/HB 418 on the April 30, 2013 actuarial valuation, which sets the contribution rate for FY 2015.

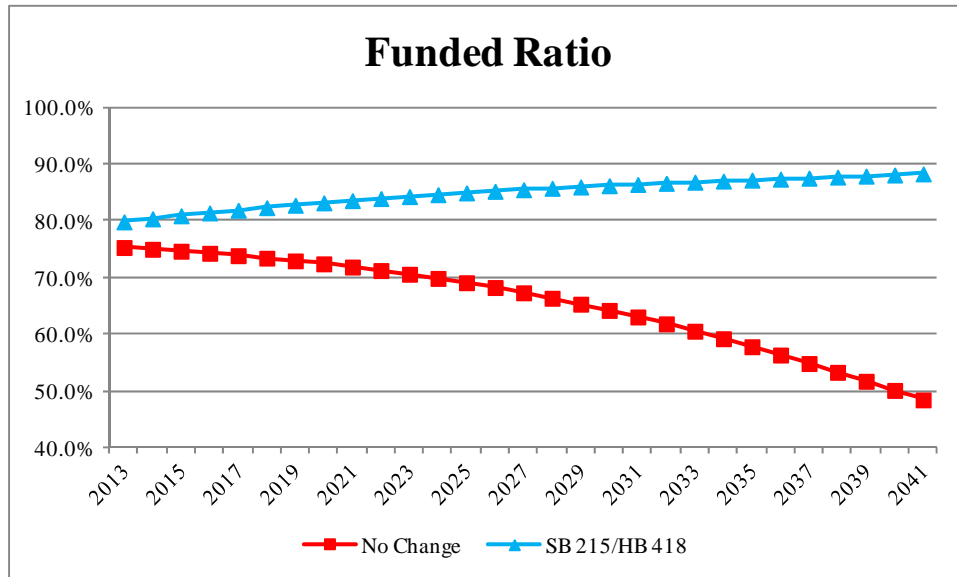


<u>Impact on Employer ARC Rate</u>			
	Current Plan Provisions		SB 215/HB 418 New Assumptions³
	Original Assumptions¹	New Assumptions²	
FY 2015 Contribution			
Total Normal Cost Rate	25.29%	27.01%	25.01%
Member Contribution Rate	(10.55%)	(10.55%)	(11.55%)
UAAL Contribution Rate	24.46%	16.26%	10.97%
Expenses	<u>0.40%</u>	<u>0.40%</u>	<u>0.40%</u>
Employer Contribution Rate	39.61%	33.12%	24.83%
UAAL (\$M)	\$256.1	\$292.4	\$198.2
Funded Ratio on market value of assets	75.3%	72.7%	79.9%

¹ See Exhibit B
² See Exhibit C
³ See Exhibit E

The projected April 30, 2013 valuation results provide a reasonable estimate of the short term impact of SB 215/HB 418. However, the plan changes for new hires will unfold over time as current active members leave covered employment and are replaced by new employees who are covered by the new benefit structure (Tier II). Therefore, in order to analyze the impact of the proposed plan design for new hires on the System's long term funding, actuarial projections of future valuation results are necessary. These projections are shown in the attached Exhibits A through E. Each exhibit shows the Normal Cost Rate, the Unfunded Actuarial Accrued Liability (UAAL) Contribution Rate, the Total Contribution Rate, the Employer Contribution Rate and the dollar amount of Employer Contributions which are required under R.S.Mo.§105.665. The long term cost impact of SB 215/HB 418, using the new set of assumptions, is a decrease in the total employer contributions of \$421 million over the projection period (\$1,438 million in Exhibit C less \$1,017 million in Exhibit E). As the projections illustrate, the normal cost rate declines by 4.80% of payroll from 28.61% to 23.81%. With the additional 1.0% contribution by members, the long term effect on the employer normal cost rate is a total decrease of 5.80%. The decrease in the normal cost rate will emerge over time as new employees replace current actives.

In all but Exhibit A, the City is assumed to contribute the full Actuarial Required Contribution (ARC), which is the sum of the normal cost rate, the payment on the unfunded actuarial accrued liability, and the expense load of 0.40%. Under Missouri statutes, this cost study is required to disclose whether the employer has been contributing the total actuarial contribution rate. For many years, the employer (City of Kansas City, Missouri) has contributed a fixed contribution rate of 19.7%. If this practice continues and no changes are made to the current plan provisions, the actuarial projections in Exhibit A illustrate that the funded ratio of the System is expected to decline to around 50%. The provisions of SB 215/HB 418 require the City to pay the full amount of the Actuarial Required Contribution (ARC) which is the sum of the employer normal cost rate, expense contribution rate and the UAAL contribution. This change, along with increased contributions from the members and changes in the benefit structure for current and future members, results in the funded ratio reaching nearly 90% in 2041 (see following graph):



The projections in the attached exhibits assume that all actuarial assumptions, including the applicable assumed investment return, are met in the future. To the extent the assumptions are not met in the future, the actuarial projections are expected to change. The projections are sensitive to the assumptions used, particularly the investment return assumption. Further analysis can be provided upon request if it is deemed to be necessary or helpful. Please note that the dollar amounts of employer contributions shown in the exhibits are future nominal dollar amounts, calculated using the projected payroll in future years. Given the length of the projection period, future payroll amounts can grow to be large numbers.

Disclaimers, Caveats, and Limitations

The numerical charts that comprise this study are based on projections using the data from the April 30, 2011 actuarial valuation and the actuarial assumptions used in the 2011 valuation, unless noted otherwise in this letter or on the attached exhibits. A projection model, based on 2011 valuation results, was prepared by the System's actuary, Cavanaugh Macdonald Consulting, LLC and was used to estimate future valuation results. Significant items are noted below:

- The investment return in all future years is assumed to be the assumed rate of return (either 7.75% or 7.5% depending on the set of assumptions being used) 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 that impact first eligibility for retirement as well as the maximum benefit are expected to impact retirement behavior in the future. This required that an adjustment be made to the current retirement rates. To the extent members retire differently than assumed, as a result of the change in plan provisions, the cost of SB 215/HB 418 will also change.
- The number of active members covered by the System in the future is assumed to remain level (neither growth nor decline in the number of active members). 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.
- Changes in the plan provisions, employee contribution rate and the date the employer starts to contribute the full actuarial contribution rate are May 1, 2013. If the effective date of the changes is different it may have an impact on the results of the projections.



- Plan provisions for current retirees, current actives and future actives are modified as disclosed earlier in this letter. There are no other benefit changes reflected in future years.
- The actuarial cost method, the entry age normal cost method, was used in the projections. The pure market value of assets was used in all projections and the amortization method used was the level percent of payroll method. The amortization period was an open thirty year period.
- We relied upon the membership data provided by the System 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 April 30, 2011, and project future events using one set of assumptions out of a range of many reasonable 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.

If any of the information disclosed in this letter is inaccurate, or in any way incomplete, it may impact the reliability of our results. If you have any concerns, please contact us immediately.

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 black ink that reads 'Patrice Beckham'.

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

A handwritten signature in black ink that reads 'Brent A. Banister'.

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



APPENDIX

Summary of Actuarial Assumptions and Methods

Actuarial Cost Method

The actuarial cost method is a procedure for allocating the actuarial present value of pension benefits and expenses to time periods. The method used for the valuation is known as the Entry Age Normal actuarial cost method, and has the following characteristics.

- (i) The annual normal costs for each individual active member are sufficient to accumulate the value of the member's pension at time of retirement.
- (ii) Each annual normal cost is a constant percentage of the member's year-by-year projected covered compensation.

The Entry Age Normal actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's assumed pensionable compensation rates between the entry age of the member and the assumed exit ages. The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future normal costs is called actuarial accrued liability. Deducting actuarial assets from the actuarial accrued liability determines the unfunded actuarial accrued liability or (surplus).

Asset Valuation Method

Under the asset valuation method, the difference between the actual and assumed investment return on the market value of assets is recognized evenly over a five year period. No corridor is used with the new method. The change to a new asset smoothing method was implemented by resetting the actuarial value of assets at April 30, 2011 equal to the market value of assets.

For all projections (both current plan and SB 215/HB 418), the market value of assets was used.

Amortization of Unfunded Actuarial Accrued Liability

In the actuarial valuation, the difference in the actual and expected UAAL is set up as a separate base each year, which is amortized over a closed 24 year period. Payments are calculated as a level percent of payroll, assuming future increases of 4.0% per year. In past years, the City has contributed a fixed contribution rate of 19.70% rather than the actuarial contribution rate so the amortization policy has had no real impact on the City's contributions.

For projections for the current plan and SB 215/HB 418, where the City is assumed to contribute the actuarial required contribution (ARC), the UAAL was amortized over an open 30 year period with payments that are calculated as a level percent of payroll, assuming future increases of 4.0% per year.



Actuarial Assumptions

Investment return: **Original Assumptions:** 7.75% per year, compounded annually
 New Assumptions: 7.50% per year, compounded annually.

Pay increase assumption: Rates for sample years of service are shown below.

<u>Years of Service</u>	<u>Annual Rate of Pay Increase</u>		
	<u>General Wage Growth</u>	<u>Merit and Longevity</u>	<u>Total</u>
0	4.0%	5.75%	9.75%
1	4.0%	5.50%	9.50%
2	4.0%	4.50%	8.50%
3	4.0%	4.00%	8.00%
4	4.0%	4.00%	8.00%
5	4.0%	4.00%	8.00%
10	4.0%	3.50%	7.50%
15	4.0%	0.00%	4.00%
20	4.0%	0.00%	4.00%
25	4.0%	0.00%	4.00%

Price inflation: 3.0% per year, compounded annually.

Active member payroll growth: 4.0% per year, compounded annually.

Mortality Tables:

Healthy Retirees: RP-2000 Healthy Annuitant Table using Scale AA to model future mortality improvement.

Disabled Retirees: RP-2000 Healthy Annuitant Table set forward 5 years using Scale AA to model future mortality improvement.

Actives: RP-2000 Employee Table using Scale AA to model future mortality improvement.

Rates of termination from active membership:

<u>Sample Ages</u>	<u>% of Active Members Terminating Within Next Year</u>	
	<u>Male</u>	<u>Female</u>
25	5.8%	6.3%
30	3.8%	5.0%
35	2.4%	3.5%
40	1.6%	1.6%
45	1.1%	0.5%
50	0.6%	0.0%



The rates do not apply to members eligible to retire and do not include separation on account of death or disability. All vested members are assumed to leave their contribution with the System and receive a deferred benefit.

Rates of Disability:

<u>Sample Ages</u>	<u>% of Active Members Becoming Disabled Within Next Year</u>	
	<u>Male</u>	<u>Female</u>
30	0.062%	0.134%
35	0.312%	0.672%
40	0.416%	0.896%
45	0.437%	0.941%
50	0.759%	1.635%
55	1.456%	3.136%
60	2.579%	5.555%

55% of disabilities are assumed to be duty related

Rates of Retirement:

<u>Active Members Retiring Within Next Year</u>			
<u>Current Plan</u>		<u>SB 215/HB 418</u>	
<u>Years of Service</u>	<u>Percent Retiring</u>	<u>Years of Service</u>	<u>Percent Retiring</u>
25	25%	27	20%
26	25%	28	20%
27	25%	29	20%
28	25%	30	20%
29	25%	31	20%
30	35%	32	35%
31	55%	33	30%
32	100%	34	30%
		35	100%

Current Plan: Inactive vested members are assumed to retire at age 55.

SB 215/HB 418: Inactive vested members are assumed to retire at age 60 (Tier II).



Miscellaneous and Technical Assumptions

Marriage Assumption:

85% of males and 55% of females are assumed to be married for purposes of death-in-service benefits and death-after-retirement benefits. Males are assumed to be 3 years older than their spouses. Actual reported data is utilized for retirees and beneficiaries.

Pay Increase Timing:

Assumed to occur at the start of the fiscal year.

Pay Annualization:

Reported pays for members with less than 1 year of service were annualized for valuation purposes.

Decrement Timing:

Decrements of all types are assumed to occur mid-year.

Eligibility Testing:

Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year at the start of the year in which the decrement is assumed to occur.

Benefit Service:

Service calculated to the nearest month, as of the decrement date, is used to determine the amount of benefit payable.

Child Beneficiaries:

None assumed.

Other:

Turnover decrement does not operate during retirement eligibility.

Form of Payment:

The assumed normal form of payment is an 80% joint and survivor annuity, if married (50% for those becoming members after August 28, 2013). Otherwise, a single life annuity.

Administrative Expense:

0.40% of payroll each year. Administrative expenses beyond this allocation and all investment expenses are assumed to be funded by investment return in excess of the actuarial assumed rate of return.

Cost of Living Adjustment:

Current Plan: It was assumed the Retirement Board will grant the full 3% cost of living adjustment each year.

SB 215/HB 418: It was assumed the Retirement Board will grant a 2.5% cost of living adjustment each year.



EXHIBIT A

**Police Retirement System of Kansas City, Missouri
Current Plan Provisions, Original Assumptions
Employer Contributes 19.70% of Payroll
(dollar amounts in millions)**

Valuation as of April 30,	Compensation at Valuation	Actuarial Accrued Liability (AAL)	Market Value of Assets (MVA)	Unfunded AAL(UAAL)	Funded Ratio Using MVA	UAAL Contribution Rate	Normal Cost Rate	Total Contribution Rate*	Member Contribution Rate	Employer Contribution Rate**	Employer Contribution	Actuarial Employer Contribution Rate	Actuarial Employer Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2013	\$ 94.6	\$ 1,038.3	\$ 782.2	\$ 256.1	75.3%	24.46%	25.29%	50.16%	10.55%	19.70%	\$ 18.6	38.11%	\$ 36.1
2014	97.7	1,088.3	816.5	271.8	75.0%	25.91%	25.36%	51.67%	10.55%	19.70%	19.2	39.61%	38.7
2015	100.9	1,139.9	851.4	288.5	74.7%	27.49%	25.43%	53.33%	10.55%	19.70%	19.9	41.12%	41.5
2016	104.0	1,193.2	886.8	306.4	74.3%	29.21%	25.50%	55.11%	10.55%	19.70%	20.5	42.78%	44.5
2017	107.5	1,248.3	922.6	325.7	73.9%	30.99%	25.59%	56.98%	10.55%	19.70%	21.2	44.56%	47.9
2018	111.1	1,305.5	959.0	346.5	73.5%	32.90%	25.66%	58.95%	10.55%	19.70%	21.9	46.43%	51.6
2019	114.7	1,364.7	995.9	368.8	73.0%	34.99%	25.74%	61.13%	10.55%	19.70%	22.6	48.40%	55.5
2020	118.5	1,425.8	1,033.1	392.7	72.5%	36.80%	25.83%	63.04%	10.55%	19.70%	23.4	50.58%	60.0
2021	122.3	1,489.0	1,070.5	418.5	71.9%	31.89%	25.91%	58.20%	10.55%	19.70%	24.1	52.49%	64.2
2022	126.3	1,554.1	1,107.8	446.3	71.3%	37.51%	26.00%	63.91%	10.55%	19.70%	24.9	47.65%	60.2
2023	130.3	1,620.8	1,144.6	476.2	70.6%	41.14%	26.10%	67.65%	10.55%	19.70%	25.7	53.36%	69.5
2024	134.6	1,688.9	1,180.5	508.4	69.9%	44.61%	26.18%	71.18%	10.55%	19.70%	26.5	57.10%	76.9
2025	139.0	1,758.2	1,215.2	542.9	69.1%	45.88%	26.27%	72.55%	10.55%	19.70%	27.4	60.63%	84.3
2026	143.8	1,828.7	1,248.5	580.2	68.3%	44.56%	26.36%	71.32%	10.55%	19.70%	28.3	62.00%	89.1
2027	148.6	1,900.6	1,280.3	620.3	67.4%	47.25%	26.46%	74.10%	10.55%	19.70%	29.3	60.77%	90.3
2028	154.0	1,974.1	1,310.6	663.5	66.4%	45.98%	26.53%	72.92%	10.55%	19.70%	30.3	63.55%	97.9
2029	159.5	2,049.2	1,339.2	710.0	65.4%	45.63%	26.61%	72.63%	10.55%	19.70%	31.4	62.37%	99.5
2030	165.5	2,125.8	1,365.8	760.0	64.2%	36.28%	26.67%	63.35%	10.55%	19.70%	32.6	62.08%	102.8
2031	172.1	2,204.8	1,390.9	813.9	63.1%	41.32%	26.71%	68.43%	10.55%	19.70%	33.9	52.80%	90.9
2032	178.9	2,286.0	1,414.3	871.7	61.9%	43.22%	26.75%	70.37%	10.55%	19.70%	35.2	57.88%	103.6
2033	185.9	2,369.5	1,435.7	933.8	60.6%	51.39%	26.80%	78.59%	10.55%	19.70%	36.6	59.82%	111.2
2034	193.3	2,455.5	1,454.8	1,000.6	59.2%	50.94%	26.83%	78.17%	10.55%	19.70%	38.1	68.04%	131.5
2035	201.3	2,544.1	1,471.6	1,072.5	57.8%	53.17%	26.85%	80.42%	10.55%	19.70%	39.6	67.62%	136.1
2036	209.7	2,635.9	1,486.3	1,149.6	56.4%	54.82%	26.86%	82.08%	10.55%	19.70%	41.3	69.87%	146.5
2037	219.1	2,732.1	1,499.4	1,232.7	54.9%	56.56%	26.86%	83.82%	10.55%	19.70%	43.2	71.53%	156.7
2038	228.5	2,833.1	1,511.2	1,321.8	53.3%	58.37%	26.86%	85.63%	10.55%	19.70%	45.0	73.27%	167.4
2039	238.1	2,938.8	1,521.2	1,417.5	51.8%	60.23%	26.86%	87.49%	10.55%	19.70%	46.9	75.08%	178.8
2040	248.1	3,049.2	1,528.9	1,520.3	50.1%	62.14%	26.85%	89.39%	10.55%	19.70%	48.9	76.94%	190.8
2041	258.3	3,164.8	1,534.0	1,630.8	48.5%	0.00%	26.85%	27.25%	10.55%	19.70%	50.9	78.84%	203.6
											\$ 907.4		

* Total Contribution Rate includes 0.40% for expenses.

** Actuarial valuation results set the contribution rate for the following fiscal year.

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 February 5, 2013. Projection assumes no actuarial gains and losses (i.e. all actuarial assumptions are met, including a 7.75% return on market value of assets and a 3% COLA).



EXHIBIT B

**Police Retirement System of Kansas City, Missouri
Current Plan Provisions, Original Assumptions
Employer Contributes Actuarial Required Contribution (ARC)**
(dollar amounts in millions)

Valuation as of April 30,	Compensation at Valuation	Actuarial Accrued Liability (AAL)	Market Value of Assets (MVA)	Unfunded AAL(UAAL)	Funded Ratio Using MVA	UAAL Contribution Rate	Normal Cost Rate	Total Contribution Rate*	Member Contribution Rate	Employer Contribution Rate**	Employer Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2013	\$ 94.6	\$ 1,038.3	\$ 782.2	\$ 256.1	75.3%	24.46%	25.29%	50.16%	10.55%	38.11%	\$ 36.1
2014	97.7	1,088.3	834.6	253.7	76.7%	23.46%	25.36%	49.21%	10.55%	39.61%	38.7
2015	100.9	1,139.9	891.1	248.8	78.2%	23.66%	25.43%	49.50%	10.55%	38.66%	39.0
2016	104.0	1,193.2	949.4	243.8	79.6%	23.89%	25.50%	49.80%	10.55%	38.95%	40.5
2017	107.5	1,248.3	1,010.8	237.5	81.0%	24.08%	25.59%	50.07%	10.55%	39.25%	42.2
2018	111.1	1,305.5	1,075.9	229.6	82.4%	24.26%	25.66%	50.31%	10.55%	39.52%	43.9
2019	114.7	1,364.7	1,144.7	220.0	83.9%	24.47%	25.74%	50.61%	10.55%	39.76%	45.6
2020	118.5	1,425.8	1,217.3	208.5	85.4%	24.27%	25.83%	50.50%	10.55%	40.06%	47.5
2021	122.3	1,489.0	1,294.0	195.0	86.9%	17.16%	25.91%	43.47%	10.55%	39.95%	48.9
2022	126.3	1,554.1	1,374.4	179.7	88.4%	20.47%	26.00%	46.88%	10.55%	32.92%	41.6
2023	130.3	1,620.8	1,449.2	171.6	89.4%	22.55%	26.10%	49.05%	10.55%	36.33%	47.3
2024	134.6	1,688.9	1,531.2	157.7	90.7%	23.37%	26.18%	49.95%	10.55%	38.50%	51.8
2025	139.0	1,758.2	1,619.4	138.8	92.1%	21.87%	26.27%	48.54%	10.55%	39.40%	54.8
2026	143.8	1,828.7	1,712.4	116.3	93.6%	17.59%	26.36%	44.35%	10.55%	37.99%	54.6
2027	148.6	1,900.6	1,807.5	93.2	95.1%	17.36%	26.46%	44.22%	10.55%	33.80%	50.3
2028	154.0	1,974.1	1,900.3	73.8	96.3%	13.49%	26.53%	40.42%	10.55%	33.67%	51.9
2029	159.5	2,049.2	1,996.9	52.2	97.5%	10.03%	26.61%	37.04%	10.55%	29.87%	47.6
2030	165.5	2,125.8	2,091.4	34.5	98.4%	-1.99%	26.67%	25.08%	10.55%	26.49%	43.9
2031	172.1	2,204.8	2,184.4	20.4	99.1%	0.41%	26.71%	27.52%	10.55%	14.53%	25.0
2032	178.9	2,286.0	2,260.0	26.0	98.9%	0.86%	26.75%	28.01%	10.55%	16.97%	30.4
2033	185.9	2,369.5	2,341.9	27.6	98.8%	6.22%	26.80%	33.41%	10.55%	17.46%	32.4
2034	193.3	2,455.5	2,426.9	28.5	98.8%	3.12%	26.83%	30.34%	10.55%	22.86%	44.2
2035	201.3	2,544.1	2,525.4	18.7	99.3%	1.80%	26.85%	29.05%	10.55%	19.79%	39.8
2036	209.7	2,635.9	2,621.9	14.0	99.5%	0.56%	26.86%	27.83%	10.55%	18.50%	38.8
2037	219.1	2,732.1	2,720.5	11.6	99.6%	0.62%	26.86%	27.88%	10.55%	17.28%	37.8
2038	228.5	2,833.1	2,821.4	11.7	99.6%	0.60%	26.86%	27.86%	10.55%	17.33%	39.6
2039	238.1	2,938.8	2,927.3	11.4	99.6%	0.58%	26.86%	27.84%	10.55%	17.31%	41.2
2040	248.1	3,049.2	3,038.1	11.1	99.6%	0.55%	26.85%	27.80%	10.55%	17.29%	42.9
2041	258.3	3,164.8	3,153.9	10.9	99.7%	0.00%	26.85%	27.25%	10.55%	17.25%	44.6
											\$ 1,242.8

* Total Contribution Rate includes 0.40% for expenses.
** Actuarial valuation results set the contribution rate for the following fiscal year.

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 February 5, 2013. Projection assumes no actuarial gains and losses (i.e. all actuarial assumptions are met, including a 7.75% return on market value of assets and a 3% COLA).



EXHIBIT C

**Police Retirement System of Kansas City, Missouri
Current Plan Provisions, New Assumptions
Employer Contributes Actuarial Required Contribution (ARC)**
(dollar amounts in millions)

Valuation as of April 30,	Compensation at Valuation	Actuarial Accrued Liability (AAL)	Market Value of Assets (MVA)	Unfunded AAL(UAAL)	Funded Ratio Using MVA	UAAL Contribution Rate	Normal Cost Rate	Total Contribution Rate*	Member Contribution Rate	Employer Contribution Rate**	Employer Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2013	\$ 94.6	\$ 1,070.8	\$ 778.4	\$ 292.4	72.7%	16.26%	27.01%	43.67%	10.55%	33.28%	\$ 31.5
2014	97.7	1,122.2	823.9	298.3	73.4%	16.06%	27.08%	43.54%	10.55%	33.12%	32.4
2015	100.9	1,175.3	870.9	304.3	74.1%	15.87%	27.16%	43.43%	10.55%	32.99%	33.3
2016	104.0	1,230.1	919.6	310.5	74.8%	15.70%	27.23%	43.33%	10.55%	32.88%	34.2
2017	107.5	1,286.7	969.8	316.8	75.4%	15.51%	27.32%	43.23%	10.55%	32.78%	35.2
2018	111.1	1,345.4	1,022.1	323.3	76.0%	15.31%	27.39%	43.09%	10.55%	32.68%	36.3
2019	114.7	1,406.3	1,076.4	329.9	76.5%	15.13%	27.48%	43.00%	10.55%	32.54%	37.3
2020	118.5	1,469.1	1,132.5	336.6	77.1%	14.94%	27.57%	42.91%	10.55%	32.45%	38.5
2021	122.3	1,533.9	1,190.4	343.5	77.6%	14.77%	27.65%	42.83%	10.55%	32.36%	39.6
2022	126.3	1,600.8	1,250.2	350.6	78.1%	14.61%	27.75%	42.76%	10.55%	32.28%	40.8
2023	130.3	1,669.2	1,311.4	357.8	78.6%	14.45%	27.85%	42.70%	10.55%	32.21%	42.0
2024	134.6	1,739.1	1,373.9	365.2	79.0%	14.27%	27.93%	42.60%	10.55%	32.15%	43.3
2025	139.0	1,810.2	1,437.6	372.6	79.4%	14.10%	28.02%	42.52%	10.55%	32.05%	44.5
2026	143.8	1,882.6	1,502.4	380.2	79.8%	13.91%	28.12%	42.43%	10.55%	31.97%	46.0
2027	148.6	1,956.5	1,568.6	387.9	80.2%	13.73%	28.22%	42.35%	10.55%	31.88%	47.4
2028	154.0	2,031.9	1,636.1	395.9	80.5%	13.52%	28.29%	42.22%	10.55%	31.80%	49.0
2029	159.5	2,109.1	1,705.2	403.9	80.8%	13.32%	28.37%	42.09%	10.55%	31.67%	50.5
2030	165.5	2,187.9	1,775.8	412.1	81.2%	13.09%	28.43%	41.93%	10.55%	31.54%	52.2
2031	172.1	2,269.0	1,848.6	420.4	81.5%	12.84%	28.48%	41.72%	10.55%	31.38%	54.0
2032	178.9	2,352.5	1,923.8	428.6	81.8%	12.59%	28.52%	41.52%	10.55%	31.17%	55.8
2033	185.9	2,438.4	2,001.3	437.1	82.1%	12.37%	28.56%	41.33%	10.55%	30.97%	57.6
2034	193.3	2,526.8	2,081.1	445.7	82.4%	12.12%	28.59%	41.12%	10.55%	30.78%	59.5
2035	201.3	2,618.0	2,163.5	454.5	82.6%	11.87%	28.62%	40.89%	10.55%	30.57%	61.5
2036	209.7	2,712.5	2,249.1	463.3	82.9%	11.62%	28.63%	40.65%	10.55%	30.34%	63.6
2037	219.1	2,811.5	2,339.0	472.4	83.2%	11.33%	28.63%	40.36%	10.55%	30.10%	65.9
2038	228.5	2,915.4	2,433.8	481.5	83.5%	11.08%	28.62%	40.10%	10.55%	29.81%	68.1
2039	238.1	3,024.1	2,533.3	490.8	83.8%	10.83%	28.62%	39.85%	10.55%	29.55%	70.4
2040	248.1	3,137.8	2,637.5	500.2	84.1%	10.60%	28.62%	39.62%	10.55%	29.30%	72.7
2041	258.3	3,256.6	2,746.8	509.9	84.3%	10.35%	28.61%	39.37%	10.55%	29.07%	75.1
											\$ 1,438.0

* Total Contribution Rate includes 0.40% for expenses.
** Actuarial valuation results set the contribution rate for the following fiscal year.

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 February 5, 2013. Projection assumes no actuarial gains and losses (i.e. all actuarial assumptions are met, including a 7.5% return on market value of assets and a 3% COLA).



EXHIBIT D

**Police Retirement System of Kansas City, Missouri
Senate Bill 215/House Bill 418, Original Assumptions
Employer Contributes Actuarial Required Contribution (ARC)
(dollar amounts in millions)**

Valuation as of April 30,	Compensation at Valuation	Actuarial Accrued Liability (AAL)	Market Value of Assets (MVA)	Unfunded AAL(UAAL)	Funded Ratio Using MVA	UAAL Contribution Rate	Normal Cost Rate	Total Contribution Rate*	Member Contribution Rate	Employer Contribution Rate**	Employer Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2013	\$ 95.0	\$ 953.9	\$ 789.2	\$ 164.7	82.7%	9.14%	23.56%	33.09%	11.55%	21.69%	\$ 20.6
2014	98.3	999.6	831.3	168.3	83.2%	9.02%	23.51%	32.93%	11.55%	21.54%	21.2
2015	101.6	1,047.1	875.1	172.0	83.6%	8.92%	23.47%	32.79%	11.55%	21.38%	21.7
2016	104.9	1,096.3	920.6	175.7	84.0%	8.83%	23.43%	32.65%	11.55%	21.24%	22.3
2017	108.4	1,147.2	967.7	179.6	84.3%	8.73%	23.40%	32.53%	11.55%	21.10%	22.9
2018	112.1	1,200.1	1,016.5	183.6	84.7%	8.63%	23.37%	32.40%	11.55%	20.98%	23.5
2019	115.7	1,254.7	1,067.1	187.6	85.0%	8.54%	23.34%	32.29%	11.55%	20.85%	24.1
2020	119.6	1,311.1	1,119.4	191.8	85.4%	8.45%	23.33%	32.18%	11.55%	20.74%	24.8
2021	123.3	1,369.1	1,173.1	196.0	85.7%	8.37%	23.30%	32.07%	11.55%	20.63%	25.4
2022	127.3	1,428.6	1,228.4	200.3	86.0%	8.29%	23.27%	31.96%	11.55%	20.52%	26.1
2023	131.3	1,489.4	1,284.7	204.7	86.3%	8.22%	23.23%	31.85%	11.55%	20.41%	26.8
2024	135.6	1,551.3	1,342.1	209.2	86.5%	8.12%	23.18%	31.70%	11.55%	20.30%	27.5
2025	140.0	1,613.9	1,400.3	213.6	86.8%	8.04%	23.13%	31.57%	11.55%	20.15%	28.2
2026	144.6	1,677.1	1,459.0	218.2	87.0%	7.95%	23.09%	31.44%	11.55%	20.02%	29.0
2027	149.5	1,741.2	1,518.3	222.9	87.2%	7.85%	23.06%	31.32%	11.55%	19.89%	29.7
2028	154.8	1,806.1	1,578.3	227.7	87.4%	7.75%	23.03%	31.17%	11.55%	19.77%	30.6
2029	160.3	1,871.8	1,639.2	232.6	87.6%	7.64%	22.98%	31.02%	11.55%	19.62%	31.5
2030	166.2	1,938.4	1,700.8	237.6	87.7%	7.52%	22.94%	30.86%	11.55%	19.47%	32.4
2031	172.6	2,005.8	1,763.3	242.5	87.9%	7.39%	22.89%	30.68%	11.55%	19.31%	33.3
2032	179.2	2,074.4	1,826.8	247.5	88.1%	7.27%	22.83%	30.50%	11.55%	19.13%	34.3
2033	186.0	2,143.8	1,891.2	252.6	88.2%	7.15%	22.77%	30.32%	11.55%	18.95%	35.2
2034	193.4	2,214.5	1,956.7	257.8	88.4%	7.01%	22.72%	30.13%	11.55%	18.77%	36.3
2035	201.3	2,286.5	2,023.5	263.1	88.5%	6.88%	22.67%	29.95%	11.55%	18.58%	37.4
2036	209.7	2,360.4	2,092.0	268.5	88.6%	6.74%	22.63%	29.77%	11.55%	18.40%	38.6
2037	218.8	2,437.0	2,162.9	274.1	88.8%	6.59%	22.59%	29.58%	11.55%	18.22%	39.9
2038	228.6	2,516.8	2,237.1	279.7	88.9%	6.44%	22.56%	29.39%	11.55%	18.03%	41.2
2039	238.9	2,600.7	2,315.4	285.3	89.0%	6.28%	22.52%	29.20%	11.55%	17.84%	42.6
2040	249.4	2,688.9	2,397.9	291.1	89.2%	6.14%	22.49%	29.03%	11.55%	17.65%	44.0
2041	260.1	2,781.7	2,484.8	296.9	89.3%	5.98%	22.47%	28.84%	11.55%	17.48%	45.5
											\$ 896.6

* Total Contribution Rate includes 0.40% for expenses.
** Actuarial valuation results set the contribution rate for the following fiscal year.

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 February 5, 2013. Projection assumes no actuarial gains and losses (i.e. all actuarial assumptions are met, including a 7.75% return on market value of assets and a 2.5% COLA).



EXHIBIT E

**Police Retirement System of Kansas City, Missouri
Senate Bill 215/House Bill 418, New Assumptions
Employer Contributes Actuarial Required Contribution (ARC)**
(dollar amounts in millions)

Valuation as of April 30,	Compensation at Valuation	Actuarial Accrued Liability (AAL)	Market Value of Assets (MVA)	Unfunded AAL(UAAL)	Funded Ratio Using MVA	UAAL Contribution Rate	Normal Cost Rate	Total Contribution Rate*	Member Contribution Rate	Employer Contribution Rate**	Employer Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2013	\$ 95.0	\$ 983.7	\$ 785.5	\$ 198.2	79.9%	10.97%	25.01%	36.38%	11.55%	25.03%	\$ 23.8
2014	98.3	1,030.7	828.6	202.1	80.4%	10.81%	24.95%	36.16%	11.55%	24.83%	24.4
2015	101.6	1,079.5	873.5	206.0	80.9%	10.66%	24.91%	35.97%	11.55%	24.61%	25.0
2016	104.9	1,130.1	920.1	210.0	81.4%	10.52%	24.86%	35.79%	11.55%	24.42%	25.6
2017	108.4	1,182.5	968.3	214.1	81.9%	10.38%	24.84%	35.62%	11.55%	24.24%	26.3
2018	112.1	1,236.7	1,018.3	218.4	82.3%	10.24%	24.80%	35.44%	11.55%	24.07%	27.0
2019	115.7	1,292.8	1,070.2	222.6	82.8%	10.11%	24.77%	35.28%	11.55%	23.89%	27.6
2020	119.6	1,350.7	1,123.7	227.0	83.2%	9.98%	24.75%	35.13%	11.55%	23.73%	28.4
2021	123.3	1,410.2	1,178.7	231.5	83.6%	9.87%	24.71%	34.98%	11.55%	23.58%	29.1
2022	127.3	1,471.2	1,235.3	236.0	84.0%	9.75%	24.67%	34.82%	11.55%	23.43%	29.8
2023	131.3	1,533.5	1,292.9	240.6	84.3%	9.64%	24.64%	34.67%	11.55%	23.27%	30.5
2024	135.6	1,597.0	1,351.7	245.3	84.6%	9.50%	24.58%	34.48%	11.55%	23.12%	31.4
2025	140.0	1,661.2	1,411.2	249.9	85.0%	9.38%	24.52%	34.31%	11.55%	22.93%	32.1
2026	144.6	1,726.0	1,471.3	254.7	85.2%	9.25%	24.48%	34.13%	11.55%	22.76%	32.9
2027	149.5	1,791.6	1,532.1	259.5	85.5%	9.12%	24.45%	33.97%	11.55%	22.58%	33.8
2028	154.8	1,858.2	1,593.6	264.5	85.8%	8.98%	24.41%	33.78%	11.55%	22.42%	34.7
2029	160.3	1,925.6	1,656.1	269.6	86.0%	8.84%	24.35%	33.59%	11.55%	22.23%	35.6
2030	166.2	1,993.9	1,719.2	274.7	86.2%	8.68%	24.31%	33.39%	11.55%	22.04%	36.6
2031	172.6	2,063.1	1,783.3	279.8	86.4%	8.51%	24.26%	33.17%	11.55%	21.84%	37.7
2032	179.2	2,133.4	1,848.6	284.9	86.6%	8.34%	24.19%	32.94%	11.55%	21.62%	38.7
2033	186.0	2,204.8	1,914.7	290.0	86.8%	8.19%	24.13%	32.72%	11.55%	21.39%	39.8
2034	193.4	2,277.4	1,982.0	295.3	87.0%	8.02%	24.08%	32.49%	11.55%	21.17%	40.9
2035	201.3	2,351.4	2,050.7	300.7	87.2%	7.84%	24.02%	32.27%	11.55%	20.94%	42.1
2036	209.7	2,427.4	2,121.2	306.2	87.4%	7.67%	23.98%	32.05%	11.55%	20.72%	43.4
2037	218.8	2,506.1	2,194.3	311.8	87.6%	7.48%	23.94%	31.82%	11.55%	20.50%	44.9
2038	228.6	2,588.2	2,270.7	317.5	87.7%	7.29%	23.90%	31.59%	11.55%	20.27%	46.3
2039	238.9	2,674.5	2,351.3	323.2	87.9%	7.10%	23.86%	31.36%	11.55%	20.04%	47.9
2040	249.4	2,765.2	2,436.3	328.9	88.1%	6.92%	23.83%	31.15%	11.55%	19.81%	49.4
2041	260.1	2,860.6	2,525.7	334.8	88.3%	6.74%	23.81%	30.95%	11.55%	19.60%	51.0
											\$ 1,016.8

* Total Contribution Rate includes 0.40% for expenses.
** Actuarial valuation results set the contribution rate for the following fiscal year.

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 February 5, 2013. Projection assumes no actuarial gains and losses (i.e. all actuarial assumptions are met, including a 7.5% return on market value of assets and a 2.5% COLA).