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October 19, 2016

Board of Trustees of the Police and Firemen's
Retirement Fund of the City of Berkeley, Missouri
C/O Ms. Keidra King
Director of Finance
City of Berkeley
8425 Airport Road
Berkeley, MO 63134

RE: Police and Firemen's Retirement Fund of the City of Berkeley, Missouri– Section 105.665 Cost Statement

Dear Trustees:

The purpose of this letter is to provide the Police and Firemen's Retirement Fund of the City of Berkeley, Missouri with a cost statement that is required under the Missouri Revised Statute Section 105.665 in connection with the changes adopted by the citizens of the City of Berkeley in April 2016.

A summary of the changes that are subject to this statement are as follows:

1. The authorized tax rate was increased from 11 cents per $100 of assessed valuation to 33 cents per $100 of assessed valuation.
2. All Cost of Living Adjustments (COLAs) after July 1, 2015 were eliminated
3. Upon retirement or termination of employment, only two-thirds of the member's post 12/31/2016 contributions will be refunded (in addition to 100% of all pre-12/31/2016 contributions).
4. Members who retire prior to age 55 or attaining 20 years of service will earn a lower benefit rate (2.0% vs. 2.5%) for service worked after December 31, 2016.

This cost statement is based upon the July 1, 2015 valuation results projected forward to July 1, 2016 using the actuarial methods and assumptions employed in the 2015 report as required by 105.665.2. For the purpose of this cost statement, we have assumed that the benefit provision changes were effective as of April 2016.

Our cost statement, numbered to correspond with Section 105.665, follows below:

1. The level normal cost of plan benefits currently in effect was projected to be $1,116,237 on July 1, 2016, or 51.0% of projected active payroll.
2. Under the aggregate funding method utilized there is no Amortization of Unfunded Actuarial Accrued Liability.

3. The total employer contribution rate from items one and two above was projected to be $1,116,237 or 51.0% of active payroll.

4. Contributions to the Fund were 11 cents per $100 of assessed valuation. Those contributions were not sufficient to cover the actuarially determined contribution.
5. The plan's actuarial value of assets was projected to be $12,614,006 on July 1, 2016. The actuarial accrued liability was projected to be $18,384,311 and the funded ratio 68.6%. The market value of assets was projected to be $12,602,026.
6. The estimated actuarially determined employer post-change contribution amount on July 1, 2016 is projected to be $724,684 or 33.1% of active payroll.
7. A ten-year projection of annual plan costs and funded ratios for both: i) the current plan and ii) the amended plan is presented in Exhibit II. The funded ratio under the proposed plan is projected to be higher than the current plan.
8. The changes increase employer contributions from 11 cents per $100 of assessed valuation to 33 cents per $100 of assessed valuation.
9. The proposed changes are projected to improve the ability of the plan to meet its obligations.
10. The actuarial assumptions are contained in the attached pages from the July 1, 2015 Actuarial Valuation Report.
11. We certify that all assumptions used in this cost study are the same as those used in the most recent actuarial valuation, and that such assumptions produce results which in the aggregate, are reasonable.
12. The actuarial funding method used in preparing the valuation is described in the attached pages from the July 1, 2015 Actuarial Valuation Report.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the City of Berkeley, Missouri. This information includes, but is not limited to, Plan documents and provisions, employee data, and financial information. Since the results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American

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Academy of Actuaries. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Actuarial computations included in this report are for the exclusive purposes cited in this report. Determinations for purposes other than those specifically referenced in this report may be significantly different. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security on a settlement basis.

These cost estimates are subject to the uncertainties of a regular actuarial valuation; the costs are inexact because they are based on assumptions that are themselves necessarily inexact, even though we consider them reasonable. Thus, the emerging costs may vary from those presented in this letter to the extent actual experience differs from that projected by the actuarial assumptions.

We have not explored any legal issues with respect to the plan changes. We are not attorneys and cannot give legal advice on such issues.

This report has been prepared for the internal use of and is only to be relied upon by the City of Berkeley; it is not for the use or benefit of any third party for any purpose. No portion of this report may be disclosed to any other party (other than Missouri State legislative and regulatory personnel) without Milliman's prior written consent. In the event such consent is given, the report must be provided in its entirety, unless prior written consent is obtained from Milliman. We recommend that any such party have its own actuary or other qualified professional review this report to ensure that the party understands the assumptions and uncertainties inherent in our estimates.

We are available to address any questions that you may have.

Sincerely,

Michael J. Zwiener, FSA
Consulting Actuary

Michael A. Sudduth, FSA
Consulting Actuary

CC: James Singer

Enclosures: Exhibit I
Exhibit II
Assumptions and Methods

Police and Firemen's Retirement Fund of the City of Berkeley, Missouri

Exhibit I

Projected Actuarial Valuation Results as of July 1, 2016

	Current Plan	Proposed Plan
1. Present Value of Future Benefits		
a. Active Participants	$11,344,452	$9,496,994
b. Inactive Participants	11,000,255	9,640,290
c. Total	22,344,707	19,137,284
2. Actuarial Value of Assets	12,614,006	12,614,006
3. Present Value Future Employee Contributions	1,115,364	1,115,364
4. Present Value of Future Normal Costs (1d) - (2) - (3), not less than zero	8,615,337	5,407,914
5. Present Value of Future Earnings	19,270,097	19,270,097
6. Normal Cost Rate: (4) / (5)	44.7083%	28.0638%
7. Eligible Payroll:		
a. Under Assumed Retirement Age	2,188,318	2,188,318
8. Normal Cost (EOY): (8) x 1.075	1,116,237	724,684

Exhibit II

Police and Firemen's Retirement Fund of the City of Berkeley, Missouri
July 1, 2015 Valuation Projections

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Baseline (Current Plan Provisions)											
Employee Contributions	$131,299	$132,099	$136,916	$139,849	$144,874	$149,896	$144,277	$149,269	$148,788	$149,518	$149,567
Employer Contributions (Actuarially Determined)	$1,116,237	$1,160,564	$1,292,027	$1,471,615	$1,670,291	$1,861,206	$1,903,748	$2,062,245	$2,250,673	$2,398,894	$2,579,718
Employer Contributions % of Payroll	51.0%	52.7%	56.6%	63.1%	69.2%	74.5%	79.2%	82.9%	90.8%	96.3%	103.5%
Employer Contributions (Statutory)	$203,803	$203,803	$203,803	$203,803	$203,803	$203,803	$203,803	$203,803	$203,803	$203,803	$203,803
Employer Contributions % of Expected Payroll	9.3%	9.3%	8.9%	8.7%	8.4%	8.2%	8.5%	8.2%	8.2%	8.2%	8.2%
Accrued Liability	$18,384,311	$18,972,144	$19,458,224	$20,209,514	$21,027,774	$21,827,235	$22,656,973	$23,227,412	$23,893,444	$24,608,143	$25,270,098
Actuarial Value of Assets	$12,614,006	$12,627,441	$12,438,881	$12,266,295	$12,230,263	$12,098,917	$11,912,596	$11,415,457	$10,911,513	$10,379,175	$9,705,654
Unfunded Accrued Liability (Entry Age Basis)	$5,770,305	$6,344,703	$7,019,343	$7,943,219	$8,797,511	$9,728,318	$10,744,376	$11,811,955	$12,981,930	$14,228,968	$15,564,444
Funded Percentage	68.6%	66.6%	63.9%	60.7%	58.2%	55.4%	52.6%	49.1%	45.7%	42.2%	38.4%
Market Value of Assets	$12,602,026	$12,524,414	$12,296,160	$12,266,295	$12,230,263	$12,098,917	$11,912,596	$11,415,457	$10,911,513	$10,379,175	$9,705,654
Assumed Asset Return	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
Proposed Plan											
Employee Contributions	$131,299	$132,099	$136,916	$139,849	$144,874	$149,896	$144,277	$149,269	$148,788	$149,518	$149,567
Employer Contributions (Actuarially Determined)	$724,684	$720,106	$739,264	$783,737	$818,912	$842,790	$802,268	$808,283	$812,946	$805,157	$801,582
Employer Contributions % of Payroll	33.1%	32.7%	32.4%	33.6%	33.9%	33.7%	33.4%	32.5%	32.8%	32.3%	32.2%
Employer Contributions (Statutory)	$407,606	$611,408	$611,408	$611,408	$611,408	$611,408	$611,408	$611,408	$611,408	$611,408	$611,408
Employer Contributions % of Expected Payroll	18.6%	27.8%	26.8%	26.2%	25.3%	24.5%	25.4%	24.6%	24.7%	24.5%	24.5%
Accrued Liability	$15,891,577	$16,218,912	$16,443,089	$16,918,622	$17,455,512	$17,965,916	$18,503,477	$18,816,260	$19,195,417	$19,625,748	$20,017,423
Actuarial Value of Assets	$12,614,006	$12,854,691	$13,144,561	$13,497,118	$14,042,956	$14,554,177	$15,082,720	$15,405,203	$15,781,256	$16,217,253	$16,619,246
Unfunded Accrued Liability (Entry Age Basis)	$3,277,571	$3,364,221	$3,298,528	$3,421,505	$3,412,556	$3,411,739	$3,420,757	$3,411,057	$3,414,161	$3,408,495	$3,398,177
Funded Percentage	79.4%	79.3%	79.9%	79.8%	80.4%	81.0%	81.5%	81.9%	82.2%	82.6%	83.0%
Market Value of Assets	$12,602,026	$12,735,859	$12,946,354	$13,497,118	$14,042,956	$14,554,177	$15,082,720	$15,405,203	$15,781,256	$16,217,253	$16,619,246
Assumed Asset Return	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
Differince in Actuarial Accrued Liability	($2,492,733)	($2,753,232)	($3,015,135)	($3,290,891)	($3,572,263)	($3,861,319)	($4,153,495)	($4,411,152)	($4,698,026)	($4,982,394)	($5,252,675)
Differince in Actuarial Value of Assets	$0	$227,250	$705,681	$1,230,823	$1,812,693	$2,455,261	$3,170,124	$3,989,746	$4,869,742	$5,838,078	$6,913,592

Police and Firemen's Retirement Fund
of the City of Berkeley, Missouri

July 1, 2015 Actuarial Valuation

Actuarial Methods

Following are brief descriptions of the actuarial cost and asset valuation methods used in the valuation:

Actuarial Cost Method

Aggregate Cost Method:

The normal cost rate as a percentage of covered payroll is equal to (a) divided by (b) where

(a) is the actuarial present value of future benefits (including refund of employee contributions) on the valuation date, minus the sum of actuarial value of assets and present value of future employee contributions on the valuation date.
(b) is the present value of future salaries on the valuation date.

The normal annual cost is the product of the normal cost rate times covered payroll on the valuation date.

Actuarial gains or (losses) will decrease (increase) the normal cost rate and be spread as a constant percent of payroll for the overall group.

Asset Valuation Method

Valuation assets were determined using the five-year expected return method without phase-in.

Under this method, a gain or loss for a year is determined by calculating the difference between the expected market value of assets and the actual market value of assets at the valuation date. The expected market value of assets is equal to the market value of assets at the prior valuation date, plus contributions, minus disbursements, all adjusted with interest at the valuation rate to the current valuation date. Ultimately, the actuarial value of assets is equal to the market value less:

(a) 4/5 of the prior year's gain/(loss)
(b) 3/5 of the second preceding year's gain/(loss)
(c) 2/5 of the third preceding year's gain/(loss)
(d) 1/5 of the fourth preceding year's gain/(loss)

The method became effective with the July 1, 2012 valuation.

Police and Firemen's Retirement Fund
of the City of Berkeley, Missouri

July 1, 2015 Actuarial Valuation

Actuarial Assumptions

Following are the primary actuarial assumptions used in performing the valuation:

Interest Rate — 7.5% per annum

Annual Pay Increases — 4% per year; 2.5% for inflation and 1.5% for merit

Mortality

- Actives: RP-2000 Employees Mortality Table, male and female rates, with generational projection based on Scale AA
- Healthy Inactives: RP-2000 Healthy Annuitant Mortality Table, male and female rates, with generational projection based on Scale AA
- Disabled Inactives: RP-2000 Disabled Mortality Table, male and female rates

100% of active participant deaths are assumed to be duty related.

Turnover — Separation from service for reason other than disability, death, or age/service retirement. Rates at selected ages:

	Percentage Terminating in the Next Year	
Age	Male	Female
25	8.046%	8.025%
30	5.711%	5.684%
35	3.811%	3.773%
40	1.824%	1.767%
45	0.643%	0.526%
50	0.941%	0.715%
55	0%	0%

Rate of Disability

Probability of becoming disabled during the next year. Rates at selected ages:

Age	Percentage Becoming Disabled in the Next Year
20	0.20%
25	0.25%
30	0.25%
35	0.25%
40	0.25%
45	0.33%
50	0.40%
55	0.50%
60	0%

100% of disabilities are assumed to be duty related.

Retirement

Age 55 with 10 years of service

Cost of Living Adjustment

Retirees are assumed to receive an annual 1.5% Cost of Living Adjustment.

Expenses

$60,000 flat addition to the normal cost

Dependent Information

For retired and deferred vested members, actual marital status and spouse birth date are used. For active members, 100% are assumed to be married, and males are assumed to be three years older than their spouses. Active members are assumed to have no minor dependents.