Milliman

500 North Broadway
Suite 1750
St. Louis, MO 63102
USA

Main +1 314 231 3031
Fax +1 314 231 0249

milliman.com

March 6, 2018

Prosecuting Attorneys' & Circuit Attorneys'
Retirement Fund
406 Hunters Run
Jefferson City, MO 65109

***RE: Prosecuting Attorneys' and Circuit Attorneys' Retirement System–
Section 105.665 Cost Statement***

Dear Ms. Farrow:

The purpose of this letter is to provide Prosecuting Attorneys' and Circuit Attorneys' Retirement System (PACARS) with a cost statement that is required under the Missouri Revised Statute Section 105.665 in connection with the changes proposed to Chapter 56 that are contained in SB 892.

There are a number of changes in the proposed legislation that are either clarifications or address potential future member classification changes that don't normally impact actuarial projections. A summary of the proposed "changes in plan benefits" contained in SB 892 that are subject to this statement are as follows:

1. Active members who are covered by the 50% of final average earnings benefit formula shall contribute 2% of earnings to the plan beginning on the January 1st following the effective date of change and 4% of earnings beginning on January 1, 2020. Member contributions will be refunded without interest to members on separation from the System. Contribution refunds shall not to exceed 25% of Final Average Compensation for retiring members.

2. The Normal Retirement age for non-vested members (those with less than 12 years of service on the effective date of the change) will change from age 62 to age 65.

3. The Early Retirement age for non-vested members (those with less than 12 years of service on the effective date of the change) will change from age 55 to age 60.

This cost statement is based upon the July 1, 2016 valuation results using the actuarial methods and assumptions employed in that report as required by 105.665.2. For the purpose of this cost statement, we have assumed that the benefit provision changes, include employee contributions were effective as of the 7/1/2016 valuation date.

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

1. The level percent of pay normal cost of plan benefits currently in effect is $1,332,319 or 11.5% of active payroll.

2. Amortization of Unfunded Actuarial Accrued Liability is $637,277 or 5.5% of active payroll.

3. The total employer contribution rate from items one and two above, with interest to mid-year is $2,037,366 or 17.6% of active payroll.

4. Contributions to PACARS are primarily based on Statute. Currently the Statutory contributions are sufficient to cover the actuarially determined contribution.

5. The plan's actuarial value of assets is defined to be equal to the market value of assets; $37,851,019 as contained in the July 1, 2016 Actuarial Valuation Report. The actuarial accrued liability is $45,074,928 and the funded ratio 84.0%.

6. The estimated actuarially determined employer post-change contribution rate is $1,705,263 or 14.7% of active payroll.

7. A twelve-year projection of annual plan costs and funded ratios for both: i) the current plan and ii) the current plan as modified by SB 892 is presented in Exhibit II. The funded ratio under the proposed plan decreased initially, however by the end of the projection period the proposed plan is projected to have a higher funded percentage than the current plan.

8. SB 892 does not mandate employer contributions in excess of the contribution rates currently in Statute. The current Statute does contain a mechanism that can either raise or lower the counties' monthly contribution rates based on the plan's actuarial funded percentage.

9. The proposed change is not projected to impair the ability of the plan to meet the obligations.

10. The actuarial assumptions used in the July 1, 2016 actuarial valuation are contained in the attached pages from the July 1, 2016 Actuarial Valuation Report.

11. Section 105.665 requires that:

    a. all assumptions used in this cost study be those used in the most recent actuarial valuation, and

b. the actuary certify that the assumptions used in the cost study produce results which in aggregate, are reasonable

   Modifications to the assumptions are allowed to be modified if the nature of the proposed plan changes warrant alternate assumptions. For the purpose of this cost statement, the weighted average expected retirement age is assumed to be 62 for members subject to the proposed age 65 normal retirement provision.

12. The actuarial funding method used in preparing the valuation is described in the attached pages from the July 1, 2016 Actuarial Valuation Report.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the PACARS and Williams Keepers. 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 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 proposed 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 PACARS; 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 respectfully submit the following exhibits, and we look forward to discussing them with you.

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

Sincerely,

Michael J. Zwiener, FSA
Consulting Actuary

William D. Winningham, EA
Actuary

CC: Robert McCulloch
Kent Lowry
Michael Ruff

MJZ/WDW

Enclosures: Exhibit I
Exhibit II
Assumptions and Methods

Exhibit 1

Prosecuting Attorneys' and
Circuit Attorneys' Retirement Fund

Actuarial Valuation as of July 1, 2016

Determination of Recommended Contribution

	Current Plan	Senate Bill #892
1. Entry Age Accrued Liability		
a. Active Participants	$ 20,809,461	$ 19,999,420
b. Terminated Vested Participants	6,957,183	6,957,183
c. Retired Participants	17,308,284	17,308,284
d. Total	45,074,928	44,264,887
2. Actuarial Value of Assets	37,851,019	37,851,019
3. Funded Ratio: (2) / (1d)	84.0%	85.5%
4. Entry Age Unfunded Accrued Liability: (1d) - (2)	7,223,909	6,413,868
5. Entry Age Normal Cost	1,182,319	1,089,256
6. Expected Employee Contributions	N/A	156,533
7. Assumed Expenses at Beginning of Year	150,000	150,000
8. Employer Normal Cost Including Expenses: (5) - (6) + (7)	1,332,319	1,082,723
9. Amortization of Unfunded Actuarial Accrued Liability	637,277	565,817
10. Recommended Contribution at Beginning of Year: (8) + (9)	1,969,596	1,648,540
11. Recommended Contribution, with Interest to Mid Year	2,037,366	1,705,263

Exhibit II

Prosecuting Attorneys' and Circuit Attorneys' Retirement Fund
July 1, 2016 Valuation Projections
(numbers in thousands)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Employer Contributions % of Expected Payroll	**Baseline (Current Plan Provisions)**												
Employee Contributions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Employer Contributions (Actuarially Determined)	$2,000	$2,200	$2,400	$2,300	$2,400	$2,400	$2,500	$2,600	$2,800	$2,900	$3,000	$2,900	$3,300
Employer Contributions % of Payroll	17.6%	18.5%	18.8%	17.9%	17.6%	17.1%	17.3%	17.2%	17.6%	17.8%	17.4%	16.2%	17.9%
Employer Contributions (Statutory)	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$1,900
Employer Contributions % of Expected Payroll	18.8%	18.5%	17.8%	17.1%	16.5%	15.9%	15.2%	14.7%	14.1%	13.6%	13.1%	12.6%	10.4%
Accrued Liability	$45,100	$47,300	$49,600	$52,300	$54,900	$57,200	$59,200	$60,800	$64,000	$66,100	$68,000	$68,900	$74,600
Actuarial Value of Assets*	$37,900	$40,300	$42,800	$45,400	$47,900	$50,300	$52,400	$54,400	$56,500	$58,500	$60,500	$62,500	$64,600
Unfunded Accrued Liability (Entry Age Basis)	$7,200	$6,900	$6,800	$6,900	$7,000	$7,000	$6,800	$6,400	$7,500	$7,600	$7,500	$6,400	$10,000
Funded Percentage	84.0%	85.2%	86.3%	86.8%	87.2%	87.9%	88.5%	89.5%	88.3%	88.5%	89.0%	90.7%	86.6%
Assumed Asset Return	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%
	Proposed Plan												
Employee Contributions	$200	$200	$200	$300	$400	$400	$400	$500	$500	$500	$500	$500	$500
Employer Contributions (Actuarially Determined)	$1,700	$1,800	$1,900	$1,700	$1,600	$1,500	$1,500	$1,500	$1,600	$1,700	$1,700	$1,600	$1,600
Employer Contributions % of Expected Payroll	14.7%	15.0%	14.8%	13.1%	11.5%	10.8%	10.6%	9.8%	10.0%	10.1%	9.8%	9.0%	8.9%
Employer Contributions (Statutory)	$2,200	$2,200	$2,200	$2,200	$1,900	$1,900	$1,900	$1,900	$1,900	$1,900	$1,900	$1,900	$1,900
Employer Contributions % of Expected Payroll	18.8%	18.5%	17.8%	17.1%	14.1%	13.6%	13.1%	12.6%	12.1%	11.7%	11.3%	10.8%	10.4%
Accrued Liability	$44,300	$46,300	$48,400	$50,700	$53,000	$55,100	$56,500	$57,800	$60,600	$62,300	$64,100	$65,700	$68,000
Actuarial Value of Assets*	$37,900	$40,500	$43,100	$45,900	$48,800	$51,200	$53,400	$55,700	$58,000	$60,100	$62,400	$64,800	$67,300
Unfunded Accrued Liability (Entry Age Basis)	$6,400	$5,800	$5,300	$4,800	$4,300	$3,900	$3,100	$2,200	$2,700	$2,200	$1,700	$900	$700
Funded Percentage	85.6%	87.5%	89.0%	90.5%	92.1%	92.9%	94.5%	96.4%	95.7%	96.5%	97.3%	98.6%	99.0%
Assumed Asset Return	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%

Prosecuting Attorneys' and
Circuit Attorneys' Retirement Fund

Actuarial Valuation as of July 1, 2016

ACTUARIAL ASSUMPTIONS, ASSET VALUATION METHOD AND ACTUARIAL COST METHOD USED TO PERFORM THE VALUATION

Mortality

Post-Retirement: RP-2000 Healthy Annuitant Mortality – Male and Female Rates, projected generationally using Scale AA.
Pre-Retirement: RP-2000 Employees Mortality – Male and Female Rates, projected generationally using Scale AA.
(adopted 7/1/2012)

Interest

Funding: 7.00% per annum, compounded annually (adopted 7/1/2015)

Salary Increases

3.5% per annum (adopted 7/1/2015)

Cost of Living Adjustment

2.0% per annum; 50% cap on initial benefit

Retirement Age

The later of age 60 and completion of 12 years of service. Immediate retirement for those eligible on the valuation date.

Withdrawal

Modified T-6 Table (adopted 7/1/2004). Rates at selected ages are:

Age	%
20	7.943
25	7.730
30	7.404
35	6.868
40	6.125
45	5.182
50	4.260
55	2.410
60	0.000

Disability

None.

Marriage

100% of the participants are married at time of withdrawal, retirement, or death. Males are assumed to be 3 years older than their spouses.

LAGERs Offset to Benefit

Accrued and projected benefits are offset by one-third (1/3) of the LAGERS benefits, produced by LAGERs, provided by J. Kent Lowry (most recently provided as of July 2016).

Expenses

Flat addition to normal cost equal to $150,000 (adopted 7/1/2016).

Actuarial Cost Method

The Entry Age Normal Cost Method on a closed group basis was used. Normal costs were computed as a level percent of payroll for all participants. The total entry age normal Unfunded Accrued Liability (UAL) is amortized as a level dollar amount over an open 20 year amortization period each year (adopted 7/1/2005).

Retired Lives Reserve (RLR)

Approach used for deciding whether there is sufficient surplus to grant benefit improvements. The method separates plan assets and liabilities between those in pay status and all other participants.

The RLR will increase from one year to the next by its share of actual investment return experienced by the fund, and transfers from the active life fund for the liability associated with new retirements. It will be reduced by benefit disbursements adjusted for interest. The liability to which the RLR is compared will be the present value of future benefits for those in pay status at the date of comparison.

Asset Valuation Method

Effective, July 1, 2014, the Actuarial Value of Assets is equal to the Market Value of Assets. Prior to July 1, 2014, the Actuarial Value of Assets was equal to the Smoothed Value of Assets. The Smoothed Value of Assets continues to provide an alternative contribution measurement for the System.

The Smoothed Value of Assets were determined using the expected return method with phase-in.

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

(i) 4/5 of the prior year's gain/(loss)
(ii) 3/5 of the second preceding year's gain/(loss)
(iii) 2/5 of the third preceding year's gain/(loss)
(iv) 1/5 of the fourth preceding year's gain/(loss)

In the first year this method is used the smoothed value of assets is equal to the market value as of the valuation date. In each subsequent year, the smoothed value is calculated in the same manner as above, except that the only gains or losses recognized are those occurring in the year of the change and in later years.

The smoothed value of assets for a given plan year may not be less than 80% or more than 120% of the market value for that year.

Missing or Incomplete Data

The entry age of any new participant missing his or her date of birth was assumed to be the average entry age of all other active participants.

In cases where the day of the month was omitted from a date, the first day of the month was assumed.

Any participant missing his or her month and day of hire or termination was assumed to have entered the plan on January 1 of the applicable year and terminated on December 31 of the applicable year.

For participants missing salary, the prior year's salary was used. For participants missing salary in the prior year, an average salary for the current year was used. A separate average was used for three groups: Class 1 and 2 participants, Class 3 and 4 participants who work part time, and Class 3 and 4 participants who work full time and receive the full time retirement benefit.