OVERSIGHT DIVISION
Committee on Legislative Research
Room 132, State Capitol
Jefferson City, MO 65101

Local Government: County Employees' Retirement Fund
Date: 7 March 2013
Re: Fiscal Note Number LR 1807-01 for SB 475 Lamping – Mandates that certain retirement plans shall be 100% funded in five years

Signature of Preparer:

Fred W. Munzenmaier, Southeast Actuarial Services, L.L.C.; Actuary for the System

Phone Number of Preparer: 770-662-8465

Oversight analyst's Name: Lauren Ordway

(reminder: 2014 will likely be a portion of a fiscal year, depending on effective date of bill)

Revenues: (explain amount per fiscal year and source or reason for increase)

Fiscal Year	*Revenues ($000)*
2014	**0**
2015	**0**
2016	**0**

LR 1807-01 for SB 475 Lamping will not generate any additional revenues for the County Employees' Retirement Fund (CERF) unless a source of revenue is found to cover the monetary requirements in the Costs section of this Fiscal Note below.

Savings: (explain amount per fiscal year, reason for savings and area where savings will occur)

Fiscal Year	*Savings ($000)*
2014	**0**
2015	**0**
2016	**0**

LR 1807-01 for SB 475 Lamping will not generate any additional savings for the County Employees' Retirement Fund (CERF).

Costs: (explain what type of costs will be incurred, amount per fiscal year and reason)

Fiscal Year	*Costs ($000)*
2014	**101,112**
2015	**0**
2016	**0**

LR 1807-01 for SB 475 Lamping will result in the above costs for CERF. Please see the accompanying Comment/Technical Memorandum. The 2014 amount will allow the Fund to reach a funded ratio of 100% as of January 1, 2018 as required in section 105.686.1 of the proposed bill. The calculation of the 2014 amount is based on the actuarial assumptions used in the most recent actuarial report, which is as of July 1, 2012.

Losses:(explain why revenue losses would be expected and amount per fiscal year)

Fiscal Year	*Losses ($000)*
2014	**0**
2015	**0**
2016	**0**

LR 1807-01 for SB 475 Lamping will not generate any additional losses for the County Employees' Retirement Fund (CERF).

Memorandum

To: State of Missouri Committee on Legislative Research Oversight Division

From: County Employees' Retirement Fund. Prepared by Fred Munzenmaier Actuary for the Fund, Fellow of the Society of Actuaries, Fellow Conference of Actuaries in Public Practice, Member American Academy of Actuaries, Enrolled Actuary Under ERISA

Subject: Comment/Technical Memorandum on Proposed Senate Bill 475, LR 1807-01

Date: March 7, 2013

The provisions of Senate Bill (475) (the Bill) would be impossible for CERF to meet within the allotted time period without substantial revenue sources beyond those provided in the existing Missouri statutes. To view the numbers, please see the "Costs" section of the accompanying Fiscal Note.

CERF Funding Mechanisms

CERF funding is unique. While funding for other plans comes directly from taxpayers, CERF revenues that are deposited into the CERF pension trust fund come from of the following sources:

- Assessor late fees
- Collector merchant license fees
- Collector delinquent fees
- Recorder document fees
- Employee contributions (directly from employees or paid by the respective county)

It should be noted that part of the CERF revenue supports a matching contribution to the CERF defined contribution plan. This plan has been extremely successful since its implementation in the year 2000. Employees can contribute an amount up to 100% of their compensation to a maximum of $17,500. The plan then matches 50¢ for every dollar the employee contributes up to 6% of pay.

CERF revenues are predictable. Therefore, the actuary is able to design a pension benefit formula that can be supported by the expected revenues. CERF determines its revenue first and then determines the benefits. Other plans first determine their benefits, and then they depend on the taxpayers for the revenue.

Knowing that CERF revenue sources are fixed, the CERF Board of Directors (with a great deal of help from its actuary) has designed its pension formula conservatively so that the benefits can be supported in the long term by the revenue from the funding sources listed above. In short term periods of adversity such as the 2008 stock market crash, CERF's prior build up of funds allows it to weather such storms.

History of CERF's Funded Ratio

CERF is a young plan compared to others in the State (and in the Nation). It started in 1994. As with all new plans, its funded ratio was zero at the starting point. Over the 18+ years since inception, the ratio has grown steadily to where it is in the 70% range at the present time. Based on sophisticated actuarial projections, the funded ratio will reach 100% by the year 2033. In the meantime, the Fund's strong positive cash flow will meet 100% of the benefit payments when those payments come due.

While these time spans may seem lengthy, the nature of the pension liabilities that CERF supports is even longer. The average new plan member comes in at approximately age 35. Sixty-three percent of these people will still be living at age 80 (i.e., 45 years from now). Twenty-four percent of them will still be alive at age 90 (55 years from now). This dynamic is the key to a defined benefit plan. Contributions build up and benefits are spread out over many years so that a plan can weather short-term adversity (e.g., the market crash of 2008) knowing that history demonstrates there is a very high probability that events will prove positive in the long run.

Benefit adjustments, required assets-to-liability ratio, frequency of adjustments, effective date of adjustments, plan monitoring

A pension plan can experience good times as well as bad times. Many of the problems that have befallen other pension plans can be traced back to over-exuberant benefit increases when times are good.

In 2005, Missouri passed CERF-specific legislation to guard against such pitfalls. Section 50.1031 pertaining to CERF has the following safeguards:

- Benefit adjustments can only be made if the funded ratio is 80% or higher.
- No benefit adjustment can be made if it causes the funded ratio to fall by more than 5 percentage points.
- Adjustments cannot be made more than once every twelve months.
- Adjustments cannot increase the required annual contribution to the plan by more than 1% of member payroll.
- Other than the plan's COLA for retirees, benefit adjustments may only apply to active plan members.

In addition to these protections, CERF carefully monitors and manages the operations of the plan. These steps include:

- CERF meticulously chooses and monitors its investments and investment advisors. They have employed a nationally prominent St. Louis firm to supervise the entire process.
- CERF does two actuarial valuations each year (not one every two years).
- The actuary does a 40-year projection of assets and liabilities much the same as the Social Security actuaries do for OASDI. Unlike Social Security, CERF projections show a bright future.
- CERF performs an actuarial gain and loss analysis to monitor the actuarial assumptions compared to actual plan experience.
- Every 5 years they perform an actuarial experience study to update the actuarial assumptions.
- They employ the largest, most prominent law firm in the State of Missouri to guide them in all aspects of the plan.
- The Board of Directors works persistently to preserve a balance between the level of benefits and the funded status of the plan. The Board realizes that employees contribute a significant portion of their compensation to support this plan and benefits must be commensurate with those contributions but without endangering the security of the plan.

Implication of Suspension of Benefit Accruals Under SB 475

We believe that it is highly unlikely that there would be revenue sources available to cover the costs shown in our Fiscal Note. Therefore, the first impact on CERF would be a curtailment of benefit accruals even though the plan in its normal course of operations is viable. Benefits would have to be curtailed because CERF presently has a funded ratio less than 80%.

Missouri counties contribute approximately $20 million annually to the CERF pension fund. Employees contribute an additional $10 million.

Conclusion

CERF is well run, well funded, and NOT a State liability.

OVERSIGHT DIVISION

Committee on Legislative Research

Room 132, State Capitol

Jefferson City, MO 65101

573/751-4143

Local Government Agency: Kansas City Public School Retirement System

Date: 03/26/2013

Re: LR# 1807-01 Bill # SB 475

Preparer Thomas Mann

Preparer's Phone Number 816.777.0883

Oversight Analyst Name Lauren Ordway

Our local government estimates the fiscal impact of the above-referenced bill for fiscal years 2013, 2014 and 2015 to be as follows:

(reminder: 2013 will likely be a portion of a fiscal year, depending on effective date of bill)

Revenues: (explain amount per fiscal year and source or reason for increase)

2013 - $57,773,433 **ER Contribution Rate - 36.75%**

2014 - $59,159,741 **ER Contribution Rate - 37.09%**

2015 - $64,724,501 **ER Contribution Rate - 39.78%**

2016 - $75,630,072 **ER Contribution Rate - 45.43%**

2017 - $82,636,374 **ER Contribution Rate - 48.44%**

In order to fulfill the requirements of the five year amortization period employer contributions would need to be increased through statute to achieve the levels noted above. The current statutory employer contribution rate is 7.5%.
See attached actuarial evaluation.

Savings: (explain amount per fiscal year, reason for savings and area where savings will occur)

Costs:(explain what type of costs will be incurred, amount per fiscal year and reason)

Losses:(explain why revenue losses would be expected and amount per fiscal year)

buckconsultants

A Xerox Company

March 26, 2013

Mr. Tom Mann
Executive Director
Kansas City Public School Retirement System
4600 The Paseo
Kansas City, MO 64110

RE: 2013 Fiscal Impact Response Form

Dear Tom:

This letter is in response to the Request for Fiscal Note number 1807-01, bill number SB 475. We have analyzed the impact that this bill would have on the Public School Retirement System of the School District of Kansas City, Missouri (KCPSRS).

Analysis Highlights

SB 475 calls for the KCPSRS to achieve 100% funding for the first year after January 1, 2018. Under the proposed legislation, the contribution rate increases significantly in 2013. This is primarily due to paying off the unfunded liability over the proposed 5 year period instead of the current 30 year policy. In addition, after the first year increase in 2013 the contribution rates above increase as we reflect $60 million in unrecognized asset losses. Assuming that all assumptions are met, the contribution rate after January 1, 2018 under SB 475 will revert to the employer normal cost, which is currently 3.28% of payroll.

A contribution policy should be a balance between the need for responsiveness to meet the actuarial needs of the Retirement System and the desire for contribution stability for those responsible for funding the Retirement System. A primary method of achieving contribution stability is to extend the amortization period. The vast majority of retirement systems use a period approaching 30 years to stabilize contributions. The 5 year period being proposed will result in excessive contribution volatility and likely will not result in the goal of 100% funding being achieved in 2018. While the significantly increased contributions under SB 475 can improve the likelihood of achieving 100% funding for the first year after January 1, 2018, actual investment returns will be the primary driver of that outcome.

Provisions of Bill Number SB 475

Fiscal Note number 1807-01, bill number SB 475, mandates that KCPSRS shall be one hundred percent funded in five years.

Basis of the Analysis

This analysis is intended to describe the financial effect of the proposed plan changes on the Retirement System. Except as otherwise noted, potential effects on other benefit plans were not considered. To determine the impact, we have recast the results of the January 1, 2012 annual actuarial valuation with changes in the funding policy parameters noted above. The actuarial assumptions and methods were consistent with those used in the regular actuarial valuation of the Retirement System on the valuation date. A summary of the primary assumptions and methods includes:

123 North Wacker Drive, Suite 1000 • Chicago, IL 60606
312.846.3000 • 312.846.3999 (fax)

- The use of the entry age normal level percent of pay actuarial cost method
- 30 year level dollar open amortization (SB 475 changes this to 5 year level percent of payroll)
- An investment rate of return of 8.00%; for purposes of the projection, we have assumed that the 8% rate of return occurs on the market value of assets.
- Projected salary increases of 5.00%

Outline of the Cost Statement

Following is an outline of the cost statement of proposed changes prepared by the actuary. Also attached is a summary of projected future actuarial valuation results, with and without this proposed legislation.

1. The level normal cost of the plan benefits currently in effect, which cost is expressed as a percent of active employee payroll.

   The total normal cost in 2012 was $16,423,797. Employee's portion of this is determined as 7.50% of covered payroll, which is $11,691,976. The employer normal cost amount in 2012 was $4,731,821. All of these figures are as of the beginning of the year. The total normal cost represents 10.54% of active employee payroll and the employer normal cost represents 3.04% of active employee payroll.

2. The contribution for unfunded accrued liabilities currently payable by the plan, which cost is expressed as a percent of active employee payroll and shall be over a period not to exceed thirty years.

   The unfunded liability contribution amount in 2012 was $11,725,833, which is 7.52% of active employee payroll. The unfunded accrued liability is amortized over 30 years as a level dollar amount.

3. The total contribution rate expressed as a percent of active employees payroll, which contribution rate shall be the total of the normal cost percent plus the contribution percent for unfunded accrued liabilities.

   The total employer contribution amount in 2012 was $16,836,200, which is 10.80% of active employee payroll.

4. A statement as to whether the legislative body is currently paying the total contribution rate as defined in subdivision (3) of this subsection.

   The contributions to KCPSRS have historically covered the actuarially required amount.

5. The total contribution rate expressed as a percent of active employee payroll which would be sufficient to adequately fund the proposed change in benefits.

   SB 475 does not include a change in benefits

6. A statement as to whether such additional contributions are mandated by the proposed change.

   SB 475 requires significant increases in the dollar amount of contributions as well as the volatility in contributions, particularly over the next five years.

7. A statement as to whether or not the proposed change would in any way impair the ability of the plan to meet the obligations thereof in effect at the time the proposal is made.

   The proposed change not impair he plan in its ability to meet obligations. The proposed change will likely impact the ability of the plan sponsor to budget for its contributions due to the extreme increase in contribution amount and contribution volatility that results from this legislation, which requires the system to full funding in 5 years.

   The last page of this response contains a chart showing the plan's projected funded status with and without the proposed legislation.

8. All assumptions relied upon to evaluate the present financial condition of the plan and all assumptions relied upon to evaluate the impact of the proposed change upon the financial condition of the plan, which shall be those assumptions used in preparing the most recent periodic actuarial valuation for the plan, unless the nature of the proposed change is such that alternative assumptions are clearly warranted, and shall be made and stated with respect to at least the following: a) Investment return, b) Pay increase, c) Mortality of employees and officials, and other persons who may receive benefits under the plan, d) Withdrawal, e)Disability, f)Retirement ages, g) Change in active employee group size.

   The assumptions are the same as in the January 1, 2012 actuarial valuation report. Inherent with the projections shown are that the plan sponsor will actually pay the significantly increased contributions proposed by this legislation.

9. The actuary shall certify that in the actuary's opinion the assumptions used for the valuation produce results which, in the aggregate, are reasonable.

   In my opinion, all assumptions currently being used for the valuation are reasonable, both individually and in the aggregate and fairly represent past and anticipated future experience.

10. A description of the actuarial funding method used in preparing the valuation including a description of the method used and period applied in amortizing unfunded actuarial accrued liabilities.

    Liabilities and contributions are computed using the Entry Age Actuarial Cost method of funding. Any funding surpluses or unfunded accrued liability is amortized over 30 years as a level dollar amount. However, in keeping with GASB requirements, the net amortization period will not exceed 30 years. Note that the proposal includes changing from a level dollar to a level percent of pay amortization.

    Projected pension and preretirement spouse's death benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each

member's expected compensation in each year for pension benefits from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

11. The increase in the total contribution amount required to adequately fund the proposed change in benefits, expressed in annual dollars as determined by multiplying the increase in total contribution rate by the active employee annual payroll used for this valuation.

    SB 475 does not include a proposed change in benefits. The increase in contribution is due to shortening the period over which unfunded liabilities are paid off.

Comments

1. The calculations are based upon assumptions regarding future events, which may or may not materialize. They are also based upon present and proposed plan provisions that are outlined in the report. If you have reason to believe that the assumptions that were used are unreasonable, that the plan provisions are incorrectly described, that important plan provisions relevant to this proposal are not described, or that conditions have changed since the calculations were made, you should contact the authors of this report prior to relying on information in the report.

2. A contribution policy should be a balance between the need for responsiveness to meet the actuarial needs of the Retirement System and the desire for contribution stability for those responsible for funding the Retirement System. A primary method of achieving contribution stability is to extend the amortization period. The vast majority of retirement systems use a period approaching 30 years to stabilize contributions, similar to the amortization period used by KCPSRS. The 5 year period being proposed will result in excessive contribution volatility for the

employer and likely will not result in the goal of 100% funding being achieved in 2018. While our projection shows that 100% funding is achieved under this proposed legislation, this is based on one reasonable scenario. As noted above, this analysis is based on assumptions that may or may not materialize.

Certification

The undersigned are Enrolled Actuaries, a Fellow or Associate of the Society of Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all Applicable Actuarial Standards of Practice. We are available to answer any questions on the material contained in the report, or to provide explanations or further details as may be appropriate.

Respectfully submitted,

BUCK CONSULTANTS, LLC

Larry Langer, FCA, ASA, MAAA, EA
Principal and Consulting Actuary

Troy Jaros, FSA, MAAA, EA
Consultant and Retirement Actuary

Kansas City PSRS
Employer Funded Status Projections
Fiscal Note Response – Number 1235-01, SB 475

Year	With Legislation		Without Legislation	
	Employer Contribution	Funded Status	Employer Contribution	Funded Status
2013	57,773,433	78%	19,689,083	77%
2014	59,159,741	81%	19,990,300	77%
2015	64,724,501	84%	21,066,768	76%
2016	75,630,072	87%	22,656,919	76%
2017	82,636,374	93%	23,346,934	75%
2018	4,678,102	100%	24,075,210	74%

GRS

Gabriel Roeder Smith & Company
Consultants & Actuaries

One Towne Square
Suite 800
Southfield, MI 48076-3723

248.799.9000 phone
248.799.9020 fax
www.gabrielroeder.com

March 6, 2013

Mr. Keith Hughes
Executive Secretary
Missouri Local Government
Employees Retirement System
P.O. Box 1665
Jefferson City, Missouri 65102

Re: Senate Bill 475

Dear Keith:

Our understanding is that Senate Bill (SB) 475 proposes various changes to how certain Missouri Retirement Systems will be funded. The purpose of this letter is to provide an estimate of additional contributions necessary for Missouri LAGERS to achieve a 100% funded ratio as defined by Section 105.660 of the Revised Statutes of Missouri (RSMo) by June 30, 2018 (i.e., the first plan year ending after January 1, 2018). Section 105.660 of the RSMo defines the funded ratio as the ratio of the actuarial value of assets over its actuarial accrued liability. An excerpt from SB 475 follows:

> *"105.686. 1. A statutory retirement plan as specified in subsection 3 of this section shall achieve and maintain a funded ratio of assets, as defined in section 105.660, equaling one hundred percent by the first plan year ending after January 1, 2018."*

As of February 29, 2012, LAGERS had a System-wide funded ratio of 83.5%. The unfunded accrued liability (UAL) was $845,833,853. Each year individual subdivisions are required to make contributions to amortize their UAL. However, the UAL is scheduled to be amortized over various periods ranging from 15 to 30 years. In accordance with the RSMo, the amortization period becomes an open period at 15 years (i.e., the amortization period is 15 years each and every year).

In order to comply with the provision outlined in SB 475, LAGERS subdivisions would need to make additional contributions. The next annual valuation date is February 28, 2013 which will determine the employer contribution rates for fiscal years beginning in calendar year 2014. Contribution rates for fiscal years beginning in calendar year 2013 have already been established by the 2012 valuations.

Although participating subdivisions are separately experience rated, we have determined the additional amortization payment as a percentage of System-wide payroll (i.e., the additional amortization payment would not be dependent upon an individual subdivision's funded ratio). In addition, since LAGERS would be required to reach a funded ratio of 100% by June 30, 2018, we have determined the additional contributions participating subdivisions would be required to make for fiscal years beginning in 2014, 2015 and 2016. (That is, given the different fiscal years of participating subdivisions, the last payment would be expected to be received by November 30, 2017.) The additional contributions necessary to reach a funded ratio of 100% for the first plan year ending after January 1, 2018 is approximately 17.35% of payroll in each of the three fiscal years. This corresponds to dollar contributions of approximately $261 million for fiscal years beginning in 2014, $270 million for fiscal years beginning in 2015 and $280 million for fiscal years beginning in 2016.

Once the System reaches a 100% funded ratio, it appears SB 475 mandates a 1-year amortization period if the System experiences an actuarial loss to maintain at least a 100% funded ratio. Shorter amortization periods introduce significant volatility in the employer contribution rates as actuarial losses occur.

In addition, SB 475 would require LAGERS to cease benefit accruals if the retirement plan funded ratio falls below eighty percent. In the case of LAGERS and its separately experience rated subdivisions, it is not clear if the funded ratio test would be performed at the System-wide or subdivision level. If the test were performed at the subdivision level, the System would either (a) achieve a 100% funded ratio sooner than would otherwise be the case or (b) the additional required employer contributions would be less than shown in this letter.

In accordance with the RSMo, the employer contribution rate for a LAGERS subdivision cannot increase by more than 1% of payroll each year. This seems to be an issue over the next several years based on the magnitude of the additional contributions required to reach a 100% funded ratio. It could also be an issue once the System reaches a 100% funded ratio and sustains possible actuarial losses which would require the contribution rate to increase more than 1% of payroll.

The methods and assumptions used were the same as those used in the LAGERS annual actuarial valuations as of February 29, 2012. In particular, the assumed rate of investment return was 7.25% and the assumed rate of payroll growth was 3.50%.

Please review this letter carefully to ensure that we have understood the bill properly and that the assumptions we have made are realistic. The analysis in this letter should not be relied upon if there is doubt about our understanding of the bill or the assumptions we have made. Our analysis relates only to the plan changes described in this correspondence. In the event that other plan changes are being considered, it is very important to remember that the results of separate actuarial analyses cannot generally be added together to produce a total. The total can be considerably greater than the sum of the parts due to the interaction of various plan provisions with each other, and with the assumptions that must be used.

We did not review this bill for compliance with Federal, State, or local laws or regulations, and internal revenue code provisions. Such a review was not within the scope of our assignment.

The undersigned are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Circular 230 Notice: Pursuant to regulations issued by the IRS, to the extent this communication (or any attachment) concerns tax matters, it is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or (ii) marketing or recommending to another party any tax-related matter addressed within. Each taxpayer should seek advice based on the individual's circumstances from an independent tax advisor.

This communication shall not be construed to provide tax advice, legal advice or investment advice.

Sincerely,

Mita Drazilov

Mita D. Drazilov, ASA, MAAA

Judith A. Kermans

Judith A. Kermans, EA, MAAA

MDD:JAK:rmg

cc: Robert Wilson (LAGERS)

MOSERS
Missouri State Employees' Retirement System

Mailing Address
PO Box 209
Jefferson City, MO 65102-0209

Office Location
907 Wildwood Drive
Jefferson City, MO 65109

MEMORANDUM

TO: Lauren Ordway, Oversight Division

FROM: Gary Findlay, Executive Director

SUBJECT: Fiscal Note No: 1807-01 (SB 475)

DATE: March 13, 2013

The proposed legislation described in Fiscal Note No. 1807-01 (SB 475) would, if enacted, require the Missouri State Employees' Plan and the Judicial Plan administered by the Missouri State Employees' Retirement System (MOSERS) to achieve and maintain a funded ratio of assets, as defined in Section 105.660 RSMo, equaling 100% by the first plan year ending January 1, 2018.

Other statutory retirement plans affected by the proposal include the:

1. County Employees' Retirement System (CERF)
2. Civilian Employees' Retirement System of the Police Department of Kansas City
3. Police Retirement System of Kansas City
4. Public School Retirement System of Kansas City
5. Local Government Employees' Retirement System (LAGERS)
6. Missouri Department of Transportation and Patrol Employees' Retirement System (MPERS)
7. Prosecuting Attorneys and Circuit Attorneys' Retirement System (PACARS)
8. Public Education Employees' Retirement System (PEERS)
9. Public School Retirement System (PSRS)
10. Sheriffs' Retirement System
11. Firemen's Retirement System of St. Louis
12. Police Retirement System of St. Louis
13. St. Louis Public School Retirement System

As proposed, a statutory retirement plan is required to achieve and maintain a funded ratio of assets equaling 100% by the first plan year ending after January 1, 2018. No adjustments to a retirement plan which has the effect of increasing liabilities of the plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual could take effect during any plan year if the funding for such year is less than 100% or would be less than 100% taking into account such adjustment. When a retirement plan funded ratio falls below 80%, benefit accruals under the plan would cease as of the valuation date for the plan year. Lastly, when the annual plan investment rate of return falls below 0%, then neither the retirement plan, the governing body of the retirement plan, nor its employees could be held civilly liable for loss or depreciation of funds or for failure to maintain the statutory retirement plan at a 100% funded ratio.

MSEP Fiscal Impact

The MSEP employer contribution rate for fiscal year 2014 is:

Total Normal Cost	8.34%
Member Contribution Rate	(0.96)
UAAL% (30-Year Amort.)	9.60
Total Employer Contrib. Rate	16.98%
UAAL $ Millions (6/30/12)	$2,896.5
Percent Funded	73.2%

MSEP Projected DB Employer Contributions

Fiscal Year	Val Payroll Projected	Before Proposed Changes Rate	Before Proposed Changes Dollars	Estimated Impact of Proposed Changes Total Rate	Estimated Impact of Proposed Changes Total Dollars	After Proposed Change Rate	After Proposed Change Dollars
2012	$1,864,069,493						
2013	1,919,991,578						
2014	1,977,591,325	16.98%	$ 335,795,007	0.00%	$ -	16.98%	$ 335,795,007
2015	2,036,919,065	16.40%	334,054,727	32.08%	653,443,636	48.48%	987,498,363
2016	2,098,026,637	15.89%	333,376,433	32.21%	675,774,379	48.10%	1,009,150,812
2017	2,160,967,436	15.40%	332,788,985	32.35%	699,072,966	47.75%	1,031,861,951
2018	2,225,796,459	14.94%	332,533,991	32.48%	722,938,690	47.42%	1,055,472,681
2019	2,292,570,353	14.51%	332,651,958	(8.90)%	(204,038,761)	5.61%	128,613,197
2020	2,361,347,464	14.11%	333,186,127	(8.75)%	(206,617,903)	5.36%	126,568,224
2021	2,432,187,888	13.72%	333,696,178	(8.61)%	(209,411,377)	5.11%	124,284,801
2022	2,505,153,525	13.35%	334,437,996	(8.48)%	(212,437,019)	4.87%	122,000,977
2023	2,580,308,131	13.00%	335,440,057	(8.35)%	(215,455,729)	4.65%	119,984,328

For purposes of the MSEP supplemental valuation, the actuary has assumed that the first year's contribution rate that would change under the proposal is the rate for the fiscal year ending June 30, 2015 (which would be determined by the June 30, 2013 actuarial valuation). In order to achieve 100% funding by June 30, 2018, the required amortization period would need to be four years. The shortening of the amortization period results in an increase in the projected employer contribution rate of 32.08% in 2015; 32.21% in 2016; 32.35% in 2017; and 32.48% in 2018. The end result would be that the State would pay approximately $1 billion dollars in employer retirement contributions per year during that four-year period.

The proposal calls for freezing benefit accruals for the plan year if the funded ratio falls below 80%. This provision is not reflected in the supplemental valuation because although the funded ratio is 73.2% as of June 30, 2012, if benefits were frozen on June 30, 2012, the funded ratio would likely exceed 80% which would mean that benefit accruals would not cease. The proposal is also silent on when benefit accruals would recommence and whether past service and salary would be restored. With the short amortization period required under the proposal, the actuary assumed that any frozen benefits would recommence within the four year amortization. Freezing benefits without subsequent replacement would result in lower costs than shown.

The timing of the cessation of benefits will likely be difficult to administer. The funded ratio for the June 30th valuation is determined by an actuarial valuation and is not known until the following September. Requiring benefit accruals to cease during the plan year in which the funded ratio falls below 80% on the valuation date would potentially require benefit accruals to cease beginning July 1 of a given year, well before the funded ratio is determined in September. This would mean that the cessation would either have to be applied retroactively to retirements that occurred between July 1 and September or retirements on and after July 1 would have to be delayed until the funded ratio is determined in September.

Judicial Plan Fiscal Impact

The Judicial Plan employer contribution rate for fiscal year 2014 is:

Total Normal Cost	19.24%
Member Contribution Rate	(0.91)
UAAL% (30-Year Amort.)	41.36
Total Employer Contrib. Rate	59.69%

UAAL $ Millions (6/30/12)	$311.1
Percent Funded	24.7%

Judicial Plan Projected DB Employer Contributions

Fiscal Year	Val Payroll Projected	Before Proposed Changes Rate	Before Proposed Changes Dollars	Estimated Impact of Proposed Changes Total Rate	Estimated Impact of Proposed Changes Total Dollars	After Proposed Change Rate	After Proposed Change Dollars
2012	$45,835,501						
2013	47,210,566						
2014	48,626,883	59.69%	$ 29,025,386	0.00%	$ 0	59.69%	$ 29,025,386
2015	50,085,690	58.47%	29,285,103	138.19%	69,213,414	196.66%	98,498,517
2016	51,588,260	57.19%	29,503,326	138.78%	71,594,187	195.97%	101,097,513
2017	53,135,908	55.92%	29,713,600	139.36%	74,050,201	195.28%	103,763,801
2018	54,729,985	54.66%	29,915,410	139.87%	76,550,830	194.53%	106,466,240
2019	56,371,885	53.55%	30,187,144	(38.35)%	(21,618,618)	15.20%	8,568,526
2020	58,063,041	52.50%	30,483,097	(37.67)%	(21,872,348)	14.83%	8,610,749
2021	59,804,933	51.55%	30,829,443	(37.09)%	(22,181,650)	14.46%	8,647,793
2022	61,599,081	50.59%	31,162,975	(36.52)%	(22,495,984)	14.07%	8,666,991
2023	63,447,053	49.68%	31,520,496	(35.95)%	(22,809,216)	13.73%	8,711,280

For purposes of the Judicial Plan supplemental valuation, the actuary has assumed that the first year's contribution rate that would change under the proposal is the rate for the fiscal year ending June 30, 2015 (which would be determined by the June 30, 2013 actuarial valuation). In order to achieve 100% funding by June 30, 2018, the required amortization period would need to be four years. The shortening of the amortization period results in an increase in the projected employer contribution rate of 138.19% in 2015; 138.78% in 2016; 139.36% in 2017; and 139.87% in 2018. The end result would be that the State would pay approximately $100 million in employer retirement contributions per year during that four-year period.

The proposal calls for freezing benefit accruals for the plan year if the funded ratio falls below 80%. This provision is not reflected in the supplemental valuation. The proposal is also silent on when benefit accruals would recommence and whether past service and salary would be restored. With the short amortization period required under the proposal, the actuary assumed that any frozen benefits would recommence within the four year amortization. Freezing benefits without subsequent replacement would result in lower costs than shown.

The timing of the cessation of benefits will likely be difficult to administer. The funded ratio for the June 30th valuation is determined by an actuarial valuation and is not known until the following September. Requiring benefit accruals to cease during the plan year in which the funded ratio falls below 80% on the valuation date would potentially require benefit accruals to cease beginning July 1 of a given year, well before the funded ratio is determined in September. This would mean that the cessation would either have to be applied retroactively to retirements that occurred between July 1 and September or retirements on and after July 1 would have to be delayed until the funded ratio is determined in September.

Technical Comment

The term "benefit accruals" is not defined within section 105.686.5, RSMo. It is assumed that the intent of this proposal is to deny active state employees service and salary credit for retirement purposes during the years in which the MSEP and Judicial plans fall below the 80% funding threshold. It is recommended that the term "benefit accruals" be defined as service and salary credit:

> 5. When a statutory retirement plan funded ratio falls below eighty percent, **members will cease earning retirement service and salary credit effective January 1 of the year following the year in which the funded ratio falls below eighty percent. Such members will resume earning retirement service and salary credit effective January 1 of the year following the year in which the funded ratio rises above eighty percent and would remain above eighty percent if such members resumed earning salary and service credit as provided in this subsection.**

There is inherent legal risk associated with stopping future plan benefit accruals for members covered by the MSEP and MSEP 2000, and members covered by the Judicial Plan prior to January 1, 2011, in that the state would effectively be diminishing the value of previously promised retirement benefits. This could lead to a claim that the State unlawfully impaired the contractual relationship between these members, the State and MOSERS. The costs associated with any such legal action could be substantial to the State and MOSERS, and are not included in this analysis.

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
One Towne Square
Suite 800
Southfield, MI 48076-3723
248.799.9000 phone
248.799.9020 fax
www.gabrielroeder.com

March 8, 2013

CONFIDENTIAL

Ms. Judith Delaney
Executive Assistant
Missouri State Employees'
Retirement System
907 Wildwood Drive
Jefferson City, MO 65109

Re: Senate Bill No. 475 (SB 475)

Dear Judy:

Enclosed are the results of a supplemental actuarial valuation as of June 30, 2012 related to a proposed benefit change for the Missouri State Employees' Retirement System.

If you have any questions or comments, please contact us.

Respectfully submitted,

Brad Lee Armstrong, ASA, EA, MAAA

David T. Kausch, FSA, EA, MAAA

BLA/DTK:sc
Enclosures

Missouri State Employees' Retirement System
Supplemental Actuarial Valuation
as of June 30, 2012

REQUESTED BY: Ms. Judith Delaney, Executive Assistant

SUBMITTED BY: Brad L. Armstrong, ASA, EA, MAAA and David T. Kausch, FSA, EA, MAAA
Gabriel, Roeder, Smith & Company

DATE: March 8, 2013

This report presents results of a supplemental actuarial valuation to measure the effect of requiring 100% funding by the plan year ending after January 1, 2018. This report may be provided to parties other than the system only in its entirety and with the permission of the system.

This report is intended to describe the financial effect of the proposed changes. No statement in this report is intended to be interpreted as a recommendation in favor of the changes, or in opposition to them. The date of the valuation was June 30, 2012. The signing actuaries are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

If the scheduled contributions are made (subject to normal year-to-year experience fluctuations), then the System will be able to pay all benefits promised when due. Our understanding is that the State is currently paying the appropriate total contribution rate.

Actuarial assumptions and methods were consistent with those used in the regular actuarial valuation of the Retirement System on the valuation date, unless otherwise noted. In particular:

- The assumed rate of interest was 8.0%.
- Payroll was assumed to increase 3% per year.
- For the regular valuation, the Unfunded Actuarial Accrued Liability is amortized over 30 years. For this supplemental valuation, beginning with the June 30, 2015 fiscal year, the Unfunded Actuarial Accrued Liability is amortized over a closed 4-year period.

The active group size is assumed to remain constant.

A brief summary of the data used in this valuation follows:

Valuation Group	Number	Payroll	Group Averages		
			Salary	Age(yrs.)	Service(yrs.)
Elected Officials	6	$ 659,978	$ 109,996	50.6	6.8
Legislators	197	7,087,518	35,977	51.3	4.5
Others	51,129	1,856,321,997	36,307	45.9	11.4
Total MOSERS	**51,332**	**$ 1,864,069,493**	**$ 36,314**	**45.9**	**11.3**

New Provisions Under Consideration:

1) A statutory retirement plan shall achieve and maintain a funded ratio of assets equaling one hundred percent by the first plan year ending after January 1, 2018.

2) No adjustment to a statutory plan which has the effect of increasing liabilities of the plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual shall take effect during any plan year if the funding for such year is less than one hundred percent or would be less than one hundred percent taking into account such adjustment.

3) When a statutory retirement plan funded ratio falls below eighty percent, benefits accruals under the plan shall cease as of the valuation date for the plan year.

4) When the annual plan investment rate of return falls below zero percent then neither the statutory retirement plan, the governing body of the statutory retirement plan, nor its employees shall be held civilly liable for loss or depreciation of funds or for failure to maintain the statutory retirement plan at a one hundred percent funded ratio.

	Impact on MOSERS DB Employer Contributions		
	Present Benefits	Proposed Benefits	Increase/ (Decrease)
FY 2013-14 Contribution			
Total Normal Cost	8.34 %	8.34 %	0.00 %
Member Contribution Rate	(0.96)	(0.96)	0.00
UAAL% (30-year amortization)	9.60	9.60	0.00
Change in UAAL% (20-year amortization)		0.00	0.00
Total Employer Contribution Rate	16.98 %	16.98 %	0.00 %
Estimated Employer Contribution	$ 335.8	$ 335.8	$ -
UAAL $ Millions (6/30/2012)	$2,896.5	$ 2,896.5	$ -
Percent Funded	73.2 %	73.2 %	0.0 %

Projected Change in Annual Employer Contributions

		Projected Employer Contributions					
		Before Proposed Changes		Estimated Impact of Proposed Changes		After Proposed Change	
Fiscal Year	Val Payroll Projected	Rate	Dollars	Total Rate	Total Dollars	Rate	Dollars
2012	$1,864,069,493						
2013	1,919,991,578						
2014	1,977,591,325	16.98%	$ 335,795,007	0.00%	$ -	16.98%	$ 335,795,007
2015	2,036,919,065	16.40%	334,054,727	32.08%	653,443,636	48.48%	987,498,363
2016	2,098,026,637	15.89%	333,376,433	32.21%	675,774,379	48.10%	1,009,150,812
2017	2,160,967,436	15.40%	332,788,985	32.35%	699,072,966	47.75%	1,031,861,951
2018	2,225,796,459	14.94%	332,533,991	32.48%	722,938,690	47.42%	1,055,472,681
2019	2,292,570,353	14.51%	332,651,958	(8.90)%	(204,038,761)	5.61%	128,613,197
2020	2,361,347,464	14.11%	333,186,127	(8.75)%	(206,617,903)	5.36%	126,568,224
2021	2,432,187,888	13.72%	333,696,178	(8.61)%	(209,411,377)	5.11%	124,284,801
2022	2,505,153,525	13.35%	334,437,996	(8.48)%	(212,437,019)	4.87%	122,000,977
2023	2,580,308,131	13.00%	335,440,057	(8.35)%	(215,455,729)	4.65%	119,984,328

This projection includes estimated changes in the contribution rate due to the increase in members participating in the 2011 Plan.

Comment A: For purposes of the supplemental valuation, we have assumed that the first year's contribution rate that would change under the proposal is the rate for the fiscal year ending June 30, 2015 (which will be determined by the June 30, 2013 actuarial valuation). In order to achieve 100% funding by June 30, 2018, the required amortization period would need to be 4 years. The shortening of the amortization period results in an increase in the projected contribution rate of 32.08% the first year. The increase in contribution rate in the remaining years of the 4-year amortization grows because the 4-year amortization is a level percent of payroll whereas original 30-year open amortization is expected to have declining rates as a percent of payroll since the period is open. There are other ways to amortize which we have not shown, such as a balloon payment in fiscal year 2018. After June 30, 2018, the unfunded amortization rate is expected to be 0.00% of payroll and the employer contribution rate is expected to equal the employer normal cost. It is important to note that this projection assumes that all assumptions will be met. With a short amortization period such as 4 years, any gains and losses which occur over time will likely result in very volatile employer contribution rates. Thereafter, if the investment rate of return is greater than zero percent, the statutory amortization period will be one year which will likely also result in very volatile ongoing employer contribution rates. The bill as we understand it would unnecessarily burden the state's budget through June 30, 2018. We recommend considering a longer amortization period due to the long-term nature of the benefits being provided.

Comment B: The proposal calls for freezing benefits accruals for the plan year if the funded ratio falls below 80%. This provision is not reflected in this supplemental valuation because although the funded ratio is 73.2% as of June 30, 2012, if benefits were frozen on June 30, 2012, the funded ratio would likely exceed 80% which would mean that benefits accruals would not cease. The proposal is also silent on when benefit accruals would recommence and whether past service and salary would be restored. With the short amortization period required under the proposal, we assume that any frozen benefits would recommence within the 4-year amortization. Freezing benefits without subsequent replacement would result in lower costs than shown in this report.

Comment C: The timing of the cessation of benefits will likely be difficult to administer. The funded ratio for the June 30th valuations is determined by actuarial valuations and is not known until the following September. Requiring benefits accruals to cease during the plan year in which the funded ratio falls below 80% on the valuation date would potentially require benefit accruals to cease beginning July 1 of a given year well before the funded ratio is determined in September. This would mean that the cessation would either have to be applied retroactively to retirements that occurred between July 1 and September or retirements on and after July 1 would have to be delayed until the funded ratio is determined in September.

Comment D: The calculations are based upon assumptions regarding future events, which may or may not materialize. They are also based upon present and proposed assumptions that are outlined in the report. If you have reason to believe that the assumptions that were used are unreasonable, that the plan provisions are incorrectly described, that important plan provisions relevant to this proposal are not described, or that conditions have changed since the calculations were made, you should contact the authors of this report prior to relying on information in the report.

Comment E: If you have reason to believe that the information provided in this report is inaccurate, or is in any way incomplete, or if you need further information in order to make an informed decision on the subject matter of this report, please contact the authors of the report prior to making such decision.

Comment F: In the event that more than one plan change is being considered, it is very important to remember that the results of separate actuarial valuations cannot generally be added together to produce a correct estimate of the combined effect of all of the changes. The total can be considerably greater than the sum of the parts due to the interaction of various plan provisions with each other, and with the assumptions that must be used.

Comment G: This report is intended to describe the financial effect of the proposed plan changes on the retirement system. Except as otherwise noted, potential effects on other benefit plans were not considered.

Comment H: The reader of this report should keep in mind that actuarial calculations are mathematical estimates based on current data and assumptions about future events (which may or may not materialize). Please note that actuarial calculations can and do vary from one valuation year to the next. As a result, the cost impact of a benefit change may fluctuate over time, as the demographics of the group changes.

Summary of Assumptions Used
for the June 30, 2012 Actuarial Valuation

- - - - - - - - - - -*Economic Assumptions* - - - - - - - - - -

The investment return rate used in the valuations was 8.0% per year, compounded annually (net after investment expenses). This assumption is used to account for the fact that equal amounts of money payable at different points in time in the future do not have the same value presently.

Pay increase assumptions for individual active members are shown for sample ages on page 8. Part of the assumption for each age is for merit and/or seniority increase, and the other 3.0% recognizes wage inflation. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

The active member payroll is assumed to increase 3.0% annually, which is the portion of the individual pay increase assumptions attributable to wage inflation.

The annual cost-of-living adjustment (COLA) is assumed to be 4.00%, on a compounded basis, when a minimum COLA of 4% is in effect. When no minimum COLA is in effect, price inflation is assumed to be 2.5% and the annual COLA is assumed to be 2.0% (80% of 2.5%), on a compounded basis.

- - - - - - - - - - *Non-Economic Assumptions* - - - - - - - - - -

The mortality table, for post-retirement mortality, used in evaluating allowances to be paid was the RP 2000 mortality table, projected to 2016 with Scale AA. Related values are shown on page 9. This assumption is used to measure the probabilities of each benefit payment being made after retirement. The pre-retirement mortality rates used were 100% of the post-retirement mortality rates for males and 80% of the post-retirement mortality for females.

The mortality tables include a margin of 15% for men and 17% for women for mortality improvements based on the four year experience study from June 30, 2007 to June 30, 2011. The mortality assumption was first used in the June 30, 2012 valuation.

Summary of Assumptions Used for the June 30, 2012 Actuarial Valuation

The probabilities of age and service retirement are shown on page 10. It was assumed that each member will be granted one half year (4 months for 2011 plan members) of service credit for unused leave upon retirement and military service purchases.

The probabilities of withdrawal from service, disability and death-in-service are shown for sample ages on page 8. For disability retirement, impaired longevity was recognized by use of special mortality tables.

The entry age normal actuarial cost method of valuation was used in determining liabilities and normal cost. Each member's normal cost was based on the benefit provisions applicable to that member. The normal cost is projected to the applicable fiscal year. Differences in the past between assumed experience and actuarial experience ("actuarial gains and losses") become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are amortized to produce payments, (principal & interest) which are level percents of payroll contributions.

The amortization of the unfunded actuarial accrued liability is based on a 30-year amortization period, level percent of payroll amortization. The amortization is based on the projected unfunded actuarial accrued liability at the beginning of the fiscal year. This method was first used in the June 30, 2010 valuation.

Employer contribution dollars were assumed to be ***paid in equal installments*** throughout the employer's fiscal year.

Actuarial value of assets. Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased-in over a closed five-year period. Valuation assets are not permitted to deviate from the market value by more than 20%.

The data about persons now covered and about present assets were furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

It is assumed that among active members 75% are married at retirement, 70% of those dying in active service are married, and men are three years older than their spouses.

The liabilities for active members hired on or after January 1, 2011 were based on MSEP 2011 benefits. The liabilities for active members hired on or after July 1, 2000 (April 26, 2005 for administrative law judges) were based on MSEP 2000 benefits. The liabilities for active members hired before July 1, 2000 for elected officials, General Assembly, and uniformed water patrol were based on MSEP benefits. The liabilities for all other active members hired before July 1, 2000 were based on the assumption that members would elect MSEP 2000 prior to age 62 and MSEP on or after age 62.

- -

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (M.A.A.A.).

Separations From Active Employment Before Service Retirement & Individual Pay Increase Assumptions June 30, 2012

		Percent of Active Members - - - - - - Separating within the Next Year - - - - -						Pay Increase Assumptions - - For An Individual Employee - -		
Sample	Years of	Withdrawal ***		Death*		Disability		Merit &	Base	Increase
Ages	Service	Men	Women	Men	Women	Men	Women	Seniority**	(Economy)	Next Year
	0	23.0 %	26.9 %							
	1	18.0	20.5							
	2	15.0	15.4							
	3	13.0	12.5							
	4	11.0	10.9							
25	5+	13.0	13.3	0.03 %	0.01 %	0.17 %	0.30 %	2.9 %	3.0 %	5.9 %
30		10.2	10.5	0.04	0.02	0.17	0.30	2.2	3.0	5.2
35		7.9	8.1	0.07	0.03	0.21	0.30	1.6	3.0	4.6
40		5.6	5.7	0.09	0.04	0.26	0.32	1.2	3.0	4.2
45		4.2	4.3	0.12	0.07	0.34	0.38	0.9	3.0	3.9
50		2.8	2.9	0.16	0.10	0.49	0.57	0.7	3.0	3.7
55		2.8	2.9	0.27	0.19	1.07	0.89	0.5	3.0	3.5
60		2.8	2.9	0.52	0.37	1.50	1.50	0.4	3.0	3.4
65		2.8	2.9	1.02	0.72	1.60	1.70	0.3	3.0	3.3
70		2.8	2.9	1.74	1.24	1.60	1.70	0.2	3.0	3.2

* *2% of the deaths in active service are assumed to be duty related.*
** *Does not apply to members of the General Assembly.*
*** *Does not apply to Elected Officials and Legislators.*

Elected Officials and Legislators

Percent of Active Members Separating within the Next Year	
Years of	Withdrawal
Service	Male/Female
1	8.0 %
2	8.0
3	8.0
4	8.0
5	12.0
6	12.0
7	12.0
8+	35.0

Post-Retirement Mortality Rates

The mortality tables were the RP 2000 mortality table, projected to 2016 with Scale AA, including a margin of 15% for men and 17% for women for mortality improvements. Disabled mortality tables are the healthy mortality tables set forward 10 years. The pre-retirement mortality rates used were 100% of the post-retirement mortality rates for males and 80% of the post-retirement mortality for females.

	Service		Disability	
Age	Men	Women	Men	Women
45	0.0012	0.0009	0.0027	0.0024
50	0.0016	0.0013	0.0052	0.0047
55	0.0027	0.0024	0.0102	0.0090
60	0.0052	0.0047	0.0174	0.0155
65	0.0102	0.0090	0.0302	0.0247
70	0.0174	0.0155	0.0548	0.0410
75	0.0302	0.0247	0.0990	0.0703
80	0.0548	0.0410	0.1720	0.1255
85	0.0990	0.0703	0.2591	0.1884

Retirement Values
June 30, 2012

Sample Attained Ages	Present Value of $1/Month the First Year (with 50% Joint & Survivor) Increasing 4.0% / 2.0% Yearly				Present Value of $1/Month the First Year Increasing 2.0% Yearly			
	Service		Disability		Service		Disability	
	Men	Women	Men	Women	Men	Women	Men	Women
40	$224.11	$224.12	$212.76	$211.89	$184.40	$186.75	$169.01	$172.32
45	217.22	217.01	202.65	201.39	177.68	180.43	157.94	162.08
50	208.28	207.81	190.14	188.39	169.01	172.32	144.49	149.76
55	196.76	196.07	175.18	172.83	157.94	162.08	128.94	135.56
60	182.48	181.61	157.88	154.80	144.49	149.76	111.76	119.87
65	165.46	164.49	138.11	134.44	128.94	135.56	92.72	102.82
70	145.94	144.91	116.94	112.03	111.76	119.87	73.10	84.62
75	123.90	123.17	96.04	88.83	92.72	102.82	55.15	66.19
80	100.55	100.10	76.52	68.15	73.10	84.62	40.28	50.49
85	78.09	77.41	59.89	52.82	55.15	66.19	30.32	40.10

Sample Attained Ages	Future Life Expectancy (Years)			
	Service		Disability	
	Men	Women	Men	Women
40	41.95	44.10	32.39	34.43
45	37.15	39.24	27.68	29.69
50	32.39	34.43	23.13	25.13
55	27.68	29.69	18.87	20.84
60	23.13	25.13	14.96	16.90
65	18.87	20.84	11.39	13.32
70	14.96	16.90	8.29	10.12
75	11.39	13.32	5.83	7.37
80	8.29	10.12	4.03	5.31
85	5.83	7.37	2.91	4.05

Percent of Eligible Active Members Retiring Next Year
(For Members Hired Prior to January 1, 2011)

Normal Retirement Pattern					Early Retirement Pattern		
	MSEP and MSEP 2000			MSEP 2011**		MSEP*	MSEP 2011**
	Percent Eligible						
Retirement Age	1st Year	2nd Year	3rd Year	Percent Eligible	Retirement Age	Percent Eligible	Percent Eligible
48	22%						
49	22	10%					
50	22	10	21%				
51	22	10	21				
52	22	10	21				
53	22	10	18				
54	22	10	18				
55	22	12	26	45%			
56	22	12	25	45			
57	22	12	22	35	57	2.5%	
58	22	12	22	35	58	3.5	
59	22	12	20	30	59	3.5	
60	21	12	22	35	60	5.0	
61	20	12	20	25	61	6.0	
62	19	22	30	40	62	6.0	10%
63	15	18	25	30	63	6.0	10
64	15	20	17	20	64	6.0	10
65	20	20	27	30	65	6.0	50
66	22	20	26	25	66	6.0	50
67	15	25	22	20	67	6.0	
68	15	20	22	20	68	6.0	
69	15	20	22	20	69	6.0	
70	25	20	22	20	70	6.0	
71	25	20	22	20	71	6.0	
72	25	20	22	20	72	6.0	
73	25	20	22	20	73	6.0	
74	25	20	22	20	74	6.0	
75	50	50	22	50	75	6.0	
76	50	50	22	50	76	6.0	
77	75	75	22	75	77	6.0	
78	100	100	100	100	78	100.0	

* *For members hired prior to January 1, 2011.*
** *For members hired on or after January 1, 2011.*

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
One Towne Square
Suite 800
Southfield, MI 48076-3723
248.799.9000 phone
248.799.9020 fax
www.gabrielroeder.com

March 8, 2013

CONFIDENTIAL

Ms. Judith Delaney
Executive Assistant
Missouri State Employees'
Retirement System
907 Wildwood Drive
Jefferson City, MO 65109

Re: Senate Bill No. 475 (SB 475) – Judges' Plan

Dear Judy:

Enclosed are the results of a supplemental actuarial valuation as of June 30, 2012 related to a proposed benefit change for the Missouri State Employees' Retirement System Judges Plan.

If you have any questions or comments, please contact us.

Respectfully submitted,

Brad Lee Armstrong, ASA, EA, MAAA

David T. Kausch, FSA, EA, MAAA

BLA/DTK:sc
Enclosures

Missouri State Employees' Retirement System - Judges
Supplemental Actuarial Valuation
as of June 30, 2012

REQUESTED BY: Ms. Judith Delaney, Executive Assistant

SUBMITTED BY: Brad L. Armstrong, ASA, EA, MAAA and David T. Kausch, FSA, EA, MAAA
Gabriel, Roeder, Smith & Company

DATE: March 8, 2013

This report presents results of a supplemental actuarial valuation to measure the effect of requiring 100% funding for the Judges Plan by the plan year ending after January 1, 2018. This report may be provided to parties other than the system only in its entirety and with the permission of the system.

This report is intended to describe the financial effect of the proposed changes. No statement in this report is intended to be interpreted as a recommendation in favor of the changes, or in opposition to them. The date of the valuation was June 30, 2012. The signing actuaries are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

If the scheduled contributions are made (subject to normal year-to-year experience fluctuations), then the System will be able to pay all benefits promised when due. Our understanding is that the State is currently paying the appropriate total contribution rate.

Actuarial assumptions and methods were consistent with those used in the regular actuarial valuation of the Retirement System on the valuation date, unless otherwise noted. In particular:

- The assumed rate of interest was 8.0%.
- Payroll was assumed to increase 3% per year.
- For the regular valuation, Unfunded Actuarial Accrued Liability as of June 30, 2012 is amortized over 30 years. For this supplemental valuation, beginning with the June 30, 2015 fiscal year, the Unfunded Actuarial Accrued Liability is amortized over a closed 4-year period.

The active group size is assumed to remain constant.

A brief summary of the data used in this valuation follows:

Valuation Group	Number	Payroll	Group Averages		
			Salary	Age(yrs.)	Service(yrs.)
Judges	398	$ 45,835,501	$ 115,165	56.5	12.5

New Provisions Under Consideration:

1) A statutory retirement plan shall achieve and maintain a funded ratio of assets equaling one hundred percent by the first plan year ending after January 1, 2018.

2) No adjustment to a statutory plan which has the effect of increasing liabilities of the plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual shall take effect during any plan year if the funding for such year is less than one hundred percent or would be less than one hundred percent taking into account such adjustment.

3) When a statutory retirement plan funded ratio falls below eighty percent, benefits accruals under the plan shall cease as of the valuation date for the plan year.

4) When the annual plan investment rate of return falls below zero percent then neither the statutory retirement plan, the governing body of the statutory retirement plan, nor its employees shall be held civilly liable for loss or depreciation of funds or for failure to maintain the statutory retirement plan at a one hundred percent funded ratio.

Missouri State Employees' Retirement System - Judges
Supplemental Actuarial Valuation
as of June 30, 2012

	Impact on MOSERS Judges DB Employer Contributions		
	Present Benefits	Proposed Benefits	Increase/ (Decrease)
FY 2013-14 Contribution			
Total Normal Cost	19.24 %	19.24 %	0.00 %
Member Contribution Rate	(0.91)	(0.91)	0.00
UAAL% (30-year amortization)	41.36	41.36	0.00
Change in UAAL% (20-year amortization)		0.00	0.00
Total Employer Contribution Rate	59.69 %	59.69 %	0.00 %
Estimated Employer Contribution	$ 29.0	$ 29.0	$ -
UAAL $ Millions (6/30/2012)	$ 311.1	$ 311.1	$ -
Percent Funded	24.7 %	24.7 %	0.0 %

Projected Change in Annual Employer Contributions

		Projected Employer Contributions					
		Before Proposed Changes		Estimated Impact of Proposed Changes		After Proposed Change	
Fiscal Year	Val Payroll Projected	Rate	Dollars	Total Rate	Total Dollars	Rate	Dollars
2012	$45,835,501						
2013	47,210,566						
2014	48,626,883	59.69%	$ 29,025,386	0.00%	$ 0	59.69%	$ 29,025,386
2015	50,085,690	58.47%	29,285,103	138.19%	69,213,414	196.66%	98,498,517
2016	51,588,260	57.19%	29,503,326	138.78%	71,594,187	195.97%	101,097,513
2017	53,135,908	55.92%	29,713,600	139.36%	74,050,201	195.28%	103,763,801
2018	54,729,985	54.66%	29,915,410	139.87%	76,550,830	194.53%	106,466,240
2019	56,371,885	53.55%	30,187,144	(38.35)%	(21,618,618)	15.20%	8,568,526
2020	58,063,041	52.50%	30,483,097	(37.67)%	(21,872,348)	14.83%	8,610,749
2021	59,804,933	51.55%	30,829,443	(37.09)%	(22,181,650)	14.46%	8,647,793
2022	61,599,081	50.59%	31,162,975	(36.52)%	(22,495,984)	14.07%	8,666,991
2023	63,447,053	49.68%	31,520,496	(35.95)%	(22,809,216)	13.73%	8,711,280

This projection includes estimated changes in the contribution rate due to the increase in members participating in the 2011 Plan.

Comment A: For purposes of the supplemental valuation, we have assumed that the first year's contribution rate that would change under the proposal is the rate for the fiscal year ending June 30, 2015 (which will be determined by the June 30, 2013 actuarial valuation). In order to achieve 100% funding by June 30, 2018, the required amortization period would need to be 4 years. The shortening of the amortization period results in an increase in the projected contribution rate of 138.19% the first year. The increase in contribution rate in the remaining years of the 4-year amortization grows because the 4-year amortization is a level percent of payroll whereas original 30-year open amortization is expected to have declining rates as a percent of payroll since the period is open. After June 30, 2018, the unfunded amortization rate is expected to be 0.00% of payroll and the employer contribution rate is expected to equal the employer normal cost. It is important to note that this projection assumes that all assumptions will be met. With a short amortization period such as 4 years, any gains and losses which occur over time will likely result in very volatile contribution rates. Thereafter, if the investment rate of return is greater than zero percent, the statutory amortization period will be one year which will likely also result in very volatile ongoing employer contribution rates. The bill as we understand it would unnecessarily burden the state's budget through June 30, 2018. We recommend considering a longer amortization period due to the long-term nature of the benefits being provided.

Comment B: The proposal calls for freezing benefits accruals for the plan year if the funded ratio falls below 80%. This provision is not reflected in this supplemental valuation. The proposal is silent on when benefit accruals would recommence and whether past service and salary would be restored. With the short amortization period required under the proposal, we assume that any frozen benefits would recommence within the 4-year amortization. Freezing benefits without subsequent replacement would result in lower costs than shown in this report.

Comment C: The timing of the cessation of benefits will likely be difficult to administer. The funded ratio for the June 30th valuations is determined by actuarial valuations and is not known until the following September. Requiring benefits accruals to cease during the plan year in which the funded ratio falls below 80% on the valuation date would potentially require benefit accruals to cease beginning July 1 of a given year well before the funded ratio is determined in September. This would mean that the cessation would either have to be applied retroactively to retirements that occurred between July 1 and September or retirements on and after July 1 would have to be delayed until the funded ratio is determined in September.

Comment D: The calculations are based upon assumptions regarding future events, which may or may not materialize. They are also based upon present and proposed assumptions that are outlined in the report. If you have reason to believe that the assumptions that were used are unreasonable, that the plan provisions are incorrectly described, that important plan provisions relevant to this proposal are not described, or that conditions have changed since the calculations were made, you should contact the authors of this report prior to relying on information in the report.

Comment E: If you have reason to believe that the information provided in this report is inaccurate, or is in any way incomplete, or if you need further information in order to make an informed decision on the subject matter of this report, please contact the authors of the report prior to making such decision.

Comment F: In the event that more than one plan change is being considered, it is very important to remember that the results of separate actuarial valuations cannot generally be added together to produce a correct estimate of the combined effect of all of the changes. The total can be considerably greater than the sum of the parts due to the interaction of various plan provisions with each other, and with the assumptions that must be used.

Comment G: This report is intended to describe the financial effect of the proposed plan changes on the retirement system. Except as otherwise noted, potential effects on other benefit plans were not considered.

Comment H: The reader of this report should keep in mind that actuarial calculations are mathematical estimates based on current data and assumptions about future events (which may or may not materialize). Please note that actuarial calculations can and do vary from one valuation year to the next. As a result, the cost impact of a benefit change may fluctuate over time, as the demographics of the group changes.

Summary of Assumptions Used
For the June 30, 2012 Actuarial Valuation

- - - - - - - - - - - - - *Economic Assumptions* - - - - - - - - - - - -

The investment return rate used in the valuations was 8.0% per year, compounded annually (net after investment expenses). This assumption is used to account for the fact that equal amounts of money payable at different points of time in the future do not have the same value presently.

Pay increase assumptions for individual active members are shown for sample ages on page 8. Part of the assumption for each age is for merit and/or seniority increase, and the other 3.0% recognizes wage inflation. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

The active member payroll is assumed to increase 3.0% annually, which is the portion of the individual pay increase assumptions attributable to wage inflation.

The number of active members is assumed to continue at the present number. Active and retired member data is reported as of May 31. It is assumed for valuation purposes that there is no turnover among members and no new entrants during the month of June. New entrants are assumed to have the same demographic characteristics as those hired in the last 5 years.

It is assumed that ***70%*** of ***active members*** are ***married*** at retirement and ***70%*** of those ***dying*** in ***active service*** are ***married,*** and men are 4 years older than their spouses.

The annual cost-of-living adjustment (COLA) is assumed to be 4.00%, on a compounded basis, when a minimum COLA of 4% is in effect. When no minimum COLA is in effect, price inflation is assumed to be 2.5% and the annual COLA is assumed to be 2.0% (80% of 2.5%), on a compounded basis.

Summary of Assumptions Used
For the June 30, 2012 Actuarial Valuation
(Concluded)

- - - - - - - - - - - - - *Non-Economic Assumptions* - - - - - - - - - - - - - -

The mortality table, for post-retirement mortality, used in evaluating allowances to be paid was the RP 2000 mortality table, projected to 2016 with scale AA. Related values are shown on page 9. This assumption is used to measure the probabilities of each benefit payment being made after retirement.

The mortality tables include a margin of 15% for men and 17% for women for mortality improvements based on the four-year experience study from June 30, 2007 to June 30, 2011. The mortality assumption was first used in the June 30, 2012 valuation.

The probabilities of age and service retirement are shown on page 10.

The probabilities of withdrawal from service, disability and death-in-service are shown for sample ages on page 8. For disability retirement, mortality tables were set forward 10 years.

The entry age normal actuarial cost method of valuation was used in determining liabilities and normal cost. Each member's normal cost was based on the benefit provisions in that member's present value of projected benefits. The normal cost is projected to the applicable fiscal year. Differences in the past between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are projected to the beginning of the applicable fiscal year and amortized to produce payments (principal & interest) which are level percent of payroll contributions.

The amortization of the unfunded actuarial accrued liability is based on a 30-year amortization period, level percent of payroll amortization. The amortization is based on the projected unfunded actuarial accrued liability at the beginning of the fiscal year. This method was first used in the June 30, 2010 valuation.

Employer contribution dollars were assumed to be ***paid in equal installments*** throughout the employer fiscal year.

The asset valuation method fully recognizes the expected investment return and averages unanticipated market return over a five-year period. Valuation assets must be between 80% and 120% of market value of assets.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

- -

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (M.A.A.A.).

Separations From Active Employment Before Service Retirement

& Individual Pay Increase Assumptions

June 30, 2012

Sample Ages	Percent of Active Members Separating within the Next Year: Death Men	Death Women	Disability Men	Disability Women	Pay Increase Assumptions For An Individual Employee: Merit & Seniority	Base (Economy)	Increase Next Year
25	0.03 %	0.01 %	0.01 %	0.01 %	2.2 %	3.0 %	5.2 %
30	0.04	0.02	0.02	0.01	2.2	3.0	5.2
35	0.07	0.03	0.03	0.02	1.5	3.0	4.5
40	0.09	0.04	0.04	0.03	0.8	3.0	3.8
45	0.12	0.07	0.05	0.04	0.6	3.0	3.6
50	0.16	0.10	0.08	0.07	0.5	3.0	3.5
55	0.27	0.19	0.13	0.12	0.4	3.0	3.4
60	0.52	0.37	0.20	0.19	0.0	3.0	3.0
65	1.02	0.72	0.20	0.19	0.0	3.0	3.0

Service Index	Percent of Active Members Separating within the Next Year: Withdrawal Male	Withdrawal Female
1	4.0 %	4.0 %
2	1.0	1.0
3	1.3	1.3
4	1.3	1.3
5	1.3	1.3
6-10	1.3	1.3
11-31	1.0	1.0

Post-Retirement Mortality Rates

The mortality tables were the RP 2000 mortality table, projected to 2016, which includes a margin of 15% for men and 17% for women for mortality improvements. Disabled mortality tables are the healthy mortality tables set forward 10 years.

Age	Service		Disability	
	Men	Women	Men	Women
45	0.0012	0.0009	0.0027	0.0024
50	0.0016	0.0013	0.0052	0.0047
55	0.0027	0.0024	0.0102	0.0090
60	0.0052	0.0047	0.0174	0.0155
65	0.0102	0.0090	0.0302	0.0247
70	0.0174	0.0155	0.0548	0.0410
75	0.0302	0.0247	0.0990	0.0703
80	0.0548	0.0410	0.1720	0.1255
85	0.0990	0.0703	0.2591	0.1884

Single Life Retirement Values
June 30, 2012

Sample Attained Ages	Present Value of $1/Month the First Year (with 50% Joint & Survivor) Increasing 4.0% / 2.0% Yearly				Present Value of $1/Month the First Year Increasing 2.0% Yearly			
	Service		Disability		Service		Disability	
	Men	Women	Men	Women	Men	Women	Men	Women
40	$224.38	$223.90	$213.16	$211.47	$184.40	$186.75	$169.01	$172.32
45	217.58	216.73	203.19	200.83	177.68	180.43	157.94	162.08
50	208.75	207.44	190.84	187.67	169.01	172.32	144.49	149.76
55	197.38	195.60	176.09	171.92	157.94	162.08	128.94	135.56
60	183.27	181.03	159.02	153.70	144.49	149.76	111.76	119.87
65	166.45	163.79	139.51	133.14	128.94	135.56	92.72	102.82
70	147.12	144.11	118.57	110.55	111.76	119.87	73.10	84.62
75	125.29	122.34	97.88	87.30	92.72	102.82	55.15	66.19
80	102.13	99.32	78.52	66.77	73.10	84.62	40.28	50.49
85	79.74	76.76	61.89	51.78	55.15	66.19	30.32	40.10

Sample Attained Ages	Future Life Expectancy (Years)			
	Service		Disability	
	Men	Women	Men	Women
40	41.95	44.10	32.39	34.43
45	37.15	39.24	27.68	29.69
50	32.39	34.43	23.13	25.13
55	27.68	29.69	18.87	20.84
60	23.13	25.13	14.96	16.90
65	18.87	20.84	11.39	13.32
70	14.96	16.90	8.29	10.12
75	11.39	13.32	5.83	7.37
80	8.29	10.12	4.03	5.31
85	5.83	7.37	2.91	4.05

Percent of Eligible Active Members Retiring Next Year

(For Members Hired Prior to January 1, 2011)

Normal Retirement					
Retirement Ages	Percent		Retirement Ages	Percent	
	Men	Women		Men	Women
55	15.0 %	4.0 %	66	20.0 %	23.0 %
56	15.0	4.0	67	20.0	23.0
57	15.0	4.0	68	30.0	23.0
58	15.0	4.0	69	30.0	23.0
59	5.0	4.0	70	100.0	100.0
60	10.0	10.0			
61	5.0	10.0			
62	10.0	10.0			
63	10.0	10.0			
64	10.0	10.0			
65	15.0	23.0			

Early Retirment		
Retirement Ages	Percent	
	Men	Women
62	8.0 %	4.0 %
63	8.0	4.0
64	8.0	4.0
65	8.0	4.0
66	8.0	4.0
67	8.0	4.0
68	8.0	4.0
69	8.0	4.0
70	100.0	100.0

Percent of Eligible Active Members Retiring Next Year

(For Members Hired On or After January 1, 2011)

Retirement Ages	Percent		Retirement Ages	Percent	
	Men	Women		Men	Women
62	30.0 %	35.0 %	68	20.0 %	25.0 %
63	20.0	20.0	69	30.0	50.0
64	15.0	20.0	70	100.0	100.0
65	30.0	50.0			
66	25.0	25.0			
67	20.0	25.0			

Scott Simon
Executive Director

MoDOT & Patrol Employees' Retirement System

Pam Henry
Assistant Executive Director

FISCAL NOTE INFORMATION

TO: Lauren Ordway
Fiscal Analyst

RE: Fiscal Note 1807-01
Senate Bill 475

FROM: Scott Simon
Executive Director

DATE: March 11, 2013

This proposed legislation mandates that the "statutory retirement plans" listed below be 100% funded by the first plan year ending after January 1, 2018. For MPERS that would be June 30, 2018 (four plan years away).

1. County Employees' Retirement Fund (CERF)
2. Judicial Retirement System
3. Civilian Employees' Retirement System of the Police Department of Kansas City
4. Police Retirement System of Kansas City
5. Public School Retirement System of Kansas City
6. Local Government Employees' Retirement System (LAGERS)
7. Missouri State Employees' Retirement System (MOSERS)
8. MoDOT & Patrol Employees' Retirement System (MPERS)
9. Prosecuting Attorneys and Circuit Attorneys' Retirement System (PACARS)
10. Public Education Employees' Retirement System of Missouri (PEERS)
11. Public School Retirement System of Missouri (PSRS)
12. Sheriff's Retirement System
13. Firemen's Retirement System of St. Louis
14. Police Retirement System of St. Louis
15. St. Louis Public School Retirement System

If a plan is less than 100% funded, no adjustments can be made to the plan that increases the liabilities of the plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual. Likewise, no adjustments can be made to a plan that would result in a funded status of less than 100%. If a plan is less than 80% funded, benefit accruals under the plan shall cease for the year, or years, subsequent to the valuation period falling below 80% and until the plan year following another valuation period which realizes the 80% funding threshold. Lastly, when the plan's annual investment rate of return falls below 0%, neither the plan, its governing body, nor its employees shall be held civilly liable for loss or depreciation of funds, or for failure to maintain the 100% funded ratio.

This report contains the results of a supplemental actuarial valuation of SB 475. The major provisions effecting MPERS that were considered, were:

- Shortening the amortization period to ensure that the funded status reached 100% by June 30, 2018;
- Freezing benefit accruals during any plan year where the funded status was below 80% at the beginning of the plan year.

This report was requested by MPERS. It may be shared with other parties, but only with permission of MPERS and only in its entirety.

Supplemental valuations do not predict the result of future actuarial valuations. (Future activities can affect future valuation results in an unpredictable manner.) Rather, supplemental valuations give an indication of the **probable** effect of the **change only** on future valuations without comment on the complete end result of the future valuations.

Heidi Barry is a Member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

The valuation was based upon data furnished by MPERS for the June 30, 2012 valuation. Actuarial methods and assumptions, except where otherwise noted, were the same as those used in the last regular annual actuarial valuation as of June 30, 2012. In particular:

- The assumed rate of interest was 8.25%.
- The valuation method was the entry-age actuarial cost method.
- The amortization period was 12 years for unfunded retiree liabilities and 27 years for unfunded active liability prior to the proposed change.
- Amortizations were calculated assuming payroll would increase 1.5% for each of the first two years and 3.75% per year, thereafter.
- Price inflation is assumed to be 3.25% per year.

A brief summary of the data used in this valuation is presented below.

Active and Retiree

Group	Number	Covered Payroll/ Annual Benefits	Average in Years Age	Service
MoDOT Employees	5,115	$213,982,134	45.2	14.3
Civilian Patrol Employees	1,128	42,605,045	44.7	12.3
Uniformed Patrol	1,215	72,705,989	39.6	14.4
Total	7,458	$329,293,168	44.2	14.0
Retirees and Beneficiaries	8,055	$201,906,768	70.1	N/A

Term Vested

Number
2,025

Current Plan Provisions:
Currently, members earn accrued benefits each year they are employed, regardless of the funded status of the plan.

The Board of Trustees sets the period in the funding policy to bring the plan to 100% funded. That policy currently finances all unfunded liabilities for retirees over a closed 12 year period and all other unfunded liabilities over a closed 27 year period.

Proposed Plan Provisions Under Consideration:
If MPERS is less than 80% funded on the valuation date, no benefits will be accrued during the plan year following the date of the valuation.

MPERS must achieve and maintain a funded status of 100% by June 30, 2018.

Technical Comments:
The proposed legislation **requires the governing body of each plan** to establish rules and regulations to accomplish the 100% funding goal within the designated period. Such a mandate will require the adoption of more aggressive investment policies seeking higher returns to help realize the 100% funded status within a very short timeframe, a more significant employer contribution rate, or most likely a combination of both. More aggressive investments policies expose the plans to more market risk and could result in greater losses that may exacerbate any current funding shortfalls. Employer contributions would also be increased significantly, which would limit and in some cases eliminate the employers' ability to perform the tasks they are designated to complete.

The term "benefit accruals" is not defined within section 105.686.5. The most common use of this term in the industry is with regard to service, salary, and could even include cost-of-living adjustments for benefit recipients. Assuming that is the intent of this proposal, this bill denies state employees service and salary credit (for retirement purposes) for the work they perform each day and potentially denies benefit recipients (e.g. retirees, survivors, beneficiaries) a cost-of-living adjustment (COLA) for the plan years falling below the 80% funding threshold. For the sake of this fiscal note the fiscal impact only assumes that service and salary accruals for active employees are at risk. Furthermore, there is inherent legal risk to either of these reductions that would likely get tested in a court of law as a reduction of benefits. The costs associated with any such legal action are unknown and not included in this analysis.

Lastly, the bill offers protection to each plan's governing body, along with its employees, if a 0% investment return results in the plan funding status falling below 100%. That offers no protection for returns falling below the plan's assumed rate of return (typically between 7 and 8%) where experience below that rate are recognized as a loss and reduce the plans funding status.

Fiscal Impact:
This proposed legislation is silent on a number of issues that could affect the valuation. After discussion with MPERS staff, our actuary, Gabriel Roeder Smith & Company (GRS) made assumptions about those issues in order to evaluate the financial impact. Should the actual implementation of this legislation differ from those assumptions (if passed), then the actual financial impact may be different than shown herein. Those issues include:

- The effective date of the legislation
    - GRS valued the proposed changes as if they became effective on July 1, 2012. Given the lag between the valuation date and the contribution effective date, this allows for a 5-year amortization (financing period) of the unfunded actuarial accrued liabilities as of June 30, 2012.
    - The June 30, 2012 valuation determines the employer contribution rates for fiscal year 2014. These rates have already been adopted by the Board. GRS assumed that the fiscal year 2014 employer

contributions would be changed if this legislation passes. If this is not the case, a shorter amortization and higher contribution rates would be needed.

- Method of financing
  - MPERS' statute requires level percent of payroll financing, but is silent on the actual amortization period to be used in each valuation. GRS therefore believes this would be set by Board policy.
  - GRS assumed that the amortization period would start at 5 years (in the 2012 valuation) and reduce 1 year in each future year (i.e., 5, 4, 3, 2, 1).
  - A different set of amortization periods in future valuations could be used and still satisfy the proposed legislation's requirement. For example, the amortization periods used in each valuation, beginning with the 2012 valuation could be 2, 3, 2, 4, 1 or 30, 30, 30, 30, 1 or any other combination of periods that ends with a 1-year amortization in the June 30, 2017 valuation. If the Board adopts any set of amortization periods other than what was assumed (5, 4, 3, 2, 1), then the financial effects will be different than shown herein.
- Benefit freeze
  - Section 5 states: "When a statutory retirement plan funded ratio falls below eighty percent, benefit accruals under the plan shall cease as of the valuation date for the plan year." GRS assumed that a statutory plan that starts under the 80% funding level would have benefit accruals frozen immediately. For purposes of this valuation, GRS assumed the first plan year of the freeze would be FY2013 for MPERS.
  - Based on a simplified projection, GRS determined that the benefit accruals will be frozen for 3 years (FY2013, FY2014, and FY2015), using a 5 year closed amortization period. If a different pattern of amortization periods is selected by the Board, the number of years the benefit freeze is expected to be in effect could be different.
  - GRS assumed that the benefit freeze ends the year following attainment of an 80% funded ratio. However, this is not actually specified in the legislation.
  - The manner in which the benefit freeze is actually administered can affect the reduction in liabilities as a result of the freeze. GRS valued the freeze by freezing FAP and service for the 3-year period following the valuation date.

Actuarial Statement

Employer Contributions and Valuation Results
Before Proposed Legislation
Expressed as %'s of Active Member Pays

	Non-Uniformed				
Contribution for	Civilian Patrol	MoDOT	Total	Uniformed Patrol	Total
Normal Cost	11.07%	11.07%	11.07%	17.34%	12.47%
Expenses and Disability Premium	1.43%	1.43%	1.43%	1.43%	1.43%
UAAL %	41.75%	41.75%	41.75%	36.46%	40.54%
Total Employer Rate	54.25%	54.25%	54.25%	55.23%	54.44%
UAAL $	n/a	n/a	$1,362,414,960	$412,830,098	$1,775,245,058
Funded Status					46.3%
Projected Employer Dollar Contributions FY 14	$24,879,233	$116,085,308	$140,964,541	$43,223,650	$184,188,191

Employer Contributions and Valuation Results* After Proposed Legislation Expressed as %'s of Active Member Pays					
	Non-Uniformed				
Contribution for	Civilian Patrol	MoDOT	Total	Uniformed Patrol	Total
Normal Cost	9.46%	9.46%	9.46%	15.27%	10.75%
Expenses and Disability Premium	1.43%	1.43%	1.43%	1.43%	1.43%
UAAL %	107.09%	107.09%	107.09%	108.06%	107.31%
Total Employer Rate	117.98%	117.98%	117.98%	124.76%	119.49%
UAAL $	n/a	n/a	$1,261,911,475	$375,830,991	$1,637,742,466
Funded Status					48.3%
Projected Employer Dollar Contributions FY 14	$54,106,025	$252,456,122	$306,562,147	$97,638,649	$404,200,796

* Computed as a level percent of payroll for 5 years. Contributions will then reduce to the normal cost (plus amortization of future gains and losses).

Additional Actuarial Comments:

Comment 1: It is the opinion of GRS that the costs shown herein do not reflect the long term cost of the plan. Any assertion to the contrary would be a misrepresentation of this report.

Comment 2: GRS believes the long-term costs of this plan are fairly represented by the normal costs for the 2011 Tier, prior to the proposed change. The total normal cost for the 2011 Tier is 8.97% for non-uniformed members and 13.93% for uniform patrol members. Of that amount, members will pay 4% and the employer will pay the balance.

Comment 3: The increase in employer contributions due to the additional funding requirements is partially offset by the benefit accrual freeze. GRS based the calculations on a 3-year freeze. At the end of the 3 years, GRS estimated that the funded status of the plan would be approximately 78%-80%, assuming no future gains or losses. The Board could alter the pattern of contributions to reduce the number of years benefit accrual are frozen or increase the number of years benefit accrual are frozen. The employer contribution under a 3-year freeze and a 5-year closed amortization period rises to almost 120% of payroll. If the freeze were reduced to 0 years, GRS estimates that the employer contribution would rise to approximately 131% of payroll.

Comment 4: The increase in employer contributions due to the additional funding requirements is sensitive to the first date of implementation. GRS assumed that the FY2014 rate would be recertified, resulting in a 5-year amortization. If implementation was delayed 1 year, the amortization period would need to be reduced to 4 years. Under a 4-year closed amortization (with 3 years of benefit freezes), the employer contribution would rise to the 140% to 145% of payroll range.

Comment 5: This calculation is based upon assumptions regarding future events, which may or may not materialize. It is also based upon present and proposed plan provisions that are outlined in the report.

Comment 6: This report is intended to describe the financial effects of the proposed plan changes. While more money into the fund, sooner is generally good, the proposed change results in funding the plan quicker than necessary and may place an undue burden on the plan sponsor and tax base which could be detrimental to the plan.

Comment 7: In the event that more than one plan change is being considered, it is very important to remember that the results of separate actuarial valuations cannot generally be added together to produce a correct estimate of the combined effect of all of the changes. The total can be considerably greater than the sum of the parts due to the interaction of various plan provisions with each other, and with the assumptions that must be used.

Comment 8: It is recommended that a full legal review by a qualified legal counsel before implementation.

Comment 9: MPERS is in the process of performing an Experience Study. The Board may adopt different actuarial methods and/or assumptions as a result of that study. A measurement of the effect of the proposed change under alternate sets of assumptions was outside the scope of this study.

Comment 10: GRS assumed that during periods when the benefit accruals cease for MPERS' active members, post retirement cost-of-living increases would still be granted to retired members.

The administration of this proposed provision will require programming of our pension administration system, which could incur a substantial cost.

March 21, 2013

Mr. M. Steve Yoakum
Executive Director
PSRS and PEERS of Missouri
3210 West Truman Boulevard
Jefferson City, MO 65109

Re: Public Education Employees' Retirement System of Missouri – Cost Impact of Senate Bill 475

Dear Steve:

We have estimated the financial impact of Senate Bill 475 on the Public Education Employees' Retirement System of Missouri ("PEERS"), which:

1. Requires PEERS to achieve and maintain a funded ratio of assets to liabilities, as defined in section 105.660, equalling one hundred percent by the first plan year ending after January 1, 2018 (i.e. by June 30, 2018).

2. Requires that no adjustment to PEERS, which has the effect of increasing liabilities of the Plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual, shall take effect during any plan year if the funding for such year is less than one hundred percent or would be less than one hundred percent after taking into account such adjustment.

3. Requires that if the PEERS funded ratio falls below eighty percent, benefit accruals under the plan shall cease as of the valuation date for the plan year.

4. Provides that when the annual plan investment rate of return falls below zero percent then neither PEERS, the governing body of PEERS, nor its employees shall be held civilly liable for loss or depreciation of funds or for failure to maintain the statutory retirement plan at a one hundred percent funded ratio.

For the five-year period beginning July 1, 2013 and ending June 30, 2018, we estimate the additional cost of PEERS due to the Bill to be approximately **$732 million**. As a percentage of payroll, the total contribution rate would increase to as much as **24.14% of payroll**, or 12.07% for both members and employers if split evenly.

Financial Impact

The first item noted above has the most significant impact on member and employer cost. In effect, the amortization period for the unfunded actuarial accrued liability ("UAAL") is reduced to five years. This is a significantly shorter period than the 30-year method currently used, where a new 30-year amortization base (equal to the prior year gain or loss from experience, assumption changes and method changes) is established each year. The result is a significant increase in annual cost over the next five years, followed by an annual savings for the next 25 years. See Exhibit I for a summary of the results.

Enclosed are several exhibits illustrating the projected financial impact of the Bill over the next 30 years and summarizing the assumptions and methods used in our analysis, as follows:

- Exhibit I – Summary results of the projected cost of PEERS over 30 years.
- Exhibit II – 30-year projection of the funded ratio for PEERS under the current UAAL amortization method.
- Exhibit III – 30-year projection of the total contribution rate for PEERS under the current UAAL amortization method.
- Exhibit IV – 30-year projection of the funded ratio for PEERS under the proposed UAAL amortization method of SB 475.
- Exhibit V – 30-year projection of the total contribution rate for PEERS under the proposed UAAL amortization method of SB 475.
- Exhibit VI – Summary of actuarial assumptions and methods used in our analysis.
- Exhibit VII – Certain disclosures regarding our analysis.

Please note the following as you review the enclosed exhibits:

- We have assumed that future experience will happen as assumed in the valuation assumptions, including 8.00% investment returns each year in the future.
- We have assumed that the member and employer contribution rates would be adjusted beginning July 1, 2013 to amortize the UAAL over 5 years if SB 475 is passed.
- We have assumed that there would be no adjustments to PEERS during the projection period that would have the effect of increasing liabilities of the Plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual.
- The total contribution requirement in future years is assumed to be shared equally by members and employers as is currently required.

Conclusions

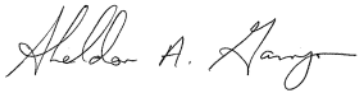
- Accelerating the UAAL amortization to a period of five years nearly doubles the contribution rates for the next five years. This approach does not provide intergenerational equity among members. A member who retires in the coming years would have contributed significantly toward paying off the UAAL, whereas a member who retires several years from now will have paid only the normal cost rate for much of their career.
- In reality, investment returns and demographic experience gains and losses will occur in future years. The requirement to "maintain a funded ratio" of 100% will result in year-over-year volatility in the contribution rates as all gains and losses will need to be reflected in the contributions during the following year. The method of smoothing investment gains and losses over five years in the actuarial value of assets will help to mitigate some of the volatility.
- To the extent members continue to share equally in the contribution requirement, accelerating the funding of the UAAL would require members to contribute more than the normal cost (10.80% of pay)

of the benefits. This may result in situations where the accumulated value of a member's contributions is greater than the value of the annuity benefit provided by the benefit formula.

- The provision of the Bill concerning the freeze of benefit accruals when the funded ratio falls below 80% should be clarified with regard to whether benefit accruals resume when the funded ratio returns to 80%, whether members continue to contribute during the freeze period, and whether lost accruals are reinstated when the funded ratio returns to 80%.

Please call with any questions or if you require additional information.

Sincerely,



Sheldon Gamzon, FSA, EA, MAAA

Brandon Robertson, ASA, EA, MAAA

Enclosure

cc: Maria Cauwenbergh Walden - PSRS
Mary Hiatte, PSRS
Becky Brenza, PwC

Exhibit I

Public Education Employees' Retirement System
SB 475 Analysis
($ in Millions)

		BASELINE Current Contribution Policy					SB 475 Contribution Policy					Difference	
Fiscal Year Beginning July 1	Total Payroll	Member Contribution Rate	Employer Contribution Rate	Total Contribution Rate	Total Contribution Amount	Funded Percentage (AVA / AAL)	Member Contribution Rate	Employer Contribution Rate	Total Contribution Rate	Total Contribution Amount	Funded Percentage (AVA / AAL)	Total Contribution Amount	Present Value of Contribution Difference
2012	1,437	6.86%	6.86%	13.72%	$197	83%	6.86%	6.86%	13.72%	$197	83%	$0	$0
2013	1,480	6.86%	6.86%	13.72%	$203	80%	11.37%	11.37%	22.74%	$337	80%	$134	$120
2014	1,525	6.91%	6.91%	13.82%	$211	81%	11.25%	11.25%	22.50%	$343	85%	$132	$110
2015	1,571	6.91%	6.91%	13.82%	$217	82%	11.16%	11.16%	22.32%	$351	89%	$134	$104
2016	1,616	6.91%	6.91%	13.82%	$223	82%	11.93%	11.93%	23.86%	$386	92%	$163	$117
2017	1,663	6.97%	6.97%	13.94%	$232	83%	12.07%	12.07%	24.14%	$401	96%	$169	$113
2018	1,708	6.99%	6.99%	13.98%	$239	84%	5.40%	5.40%	10.80%	$185	100%	($54)	($34)
2019	1,754	7.01%	7.01%	14.02%	$246	84%	5.40%	5.40%	10.80%	$190	100%	($56)	($32)
2020	1,801	7.03%	7.03%	14.06%	$253	85%	5.40%	5.40%	10.80%	$194	100%	($59)	($32)
2021	1,847	7.05%	7.05%	14.10%	$260	86%	5.40%	5.40%	10.80%	$199	100%	($61)	($30)
2022	1,893	7.06%	7.06%	14.12%	$267	86%	5.40%	5.40%	10.80%	$204	100%	($63)	($29)
2023	1,940	7.08%	7.08%	14.16%	$275	87%	5.40%	5.40%	10.80%	$210	100%	($65)	($28)
2024	1,988	7.10%	7.10%	14.20%	$282	87%	5.40%	5.40%	10.80%	$215	100%	($67)	($27)
2025	2,038	7.12%	7.12%	14.24%	$290	88%	5.40%	5.40%	10.80%	$220	100%	($70)	($26)
2026	2,087	7.13%	7.13%	14.26%	$298	88%	5.40%	5.40%	10.80%	$225	100%	($73)	($25)
2027	2,138	7.15%	7.15%	14.30%	$306	89%	5.40%	5.40%	10.80%	$231	100%	($75)	($24)
2028	2,191	7.17%	7.17%	14.34%	$314	89%	5.40%	5.40%	10.80%	$237	100%	($77)	($23)
2029	2,246	7.19%	7.19%	14.38%	$323	90%	5.40%	5.40%	10.80%	$243	100%	($80)	($22)
2030	2,302	7.20%	7.20%	14.40%	$331	90%	5.40%	5.40%	10.80%	$249	100%	($82)	($21)
2031	2,358	7.22%	7.22%	14.44%	$340	91%	5.40%	5.40%	10.80%	$255	100%	($85)	($20)
2032	2,417	7.23%	7.23%	14.46%	$349	91%	5.40%	5.40%	10.80%	$261	100%	($88)	($20)
2033	2,476	7.25%	7.25%	14.50%	$359	92%	5.40%	5.40%	10.80%	$267	100%	($92)	($19)
2034	2,537	7.27%	7.27%	14.54%	$369	93%	5.40%	5.40%	10.80%	$274	100%	($95)	($18)
2035	2,600	7.28%	7.28%	14.56%	$379	93%	5.40%	5.40%	10.80%	$281	100%	($98)	($17)
2036	2,664	7.30%	7.30%	14.60%	$389	94%	5.40%	5.40%	10.80%	$288	100%	($101)	($17)
2037	2,729	7.31%	7.31%	14.62%	$399	94%	5.40%	5.40%	10.80%	$295	100%	($104)	($16)
2038	2,796	7.33%	7.33%	14.66%	$410	95%	5.40%	5.40%	10.80%	$302	100%	($108)	($15)
2039	2,865	7.34%	7.34%	14.68%	$421	96%	5.40%	5.40%	10.80%	$309	100%	($112)	($15)
2040	2,937	7.36%	7.36%	14.72%	$432	96%	5.40%	5.40%	10.80%	$317	100%	($115)	($14)
2041	3,011	7.40%	7.40%	14.80%	$446	97%	5.40%	5.40%	10.80%	$325	100%	($121)	($14)
2042	3,086	7.40%	7.40%	14.80%	$457	98%	5.40%	5.40%	10.80%	$333	100%	($124)	($13)
2043	3,164	7.40%	7.40%	14.80%	$468	99%	5.40%	5.40%	10.80%	$342	100%	($126)	($13)
Total					$10,185					$8,666		($1,519)	$0

Public Education Employees' Retirement System of Missouri
BASELINE
Projection of Funded Ratio

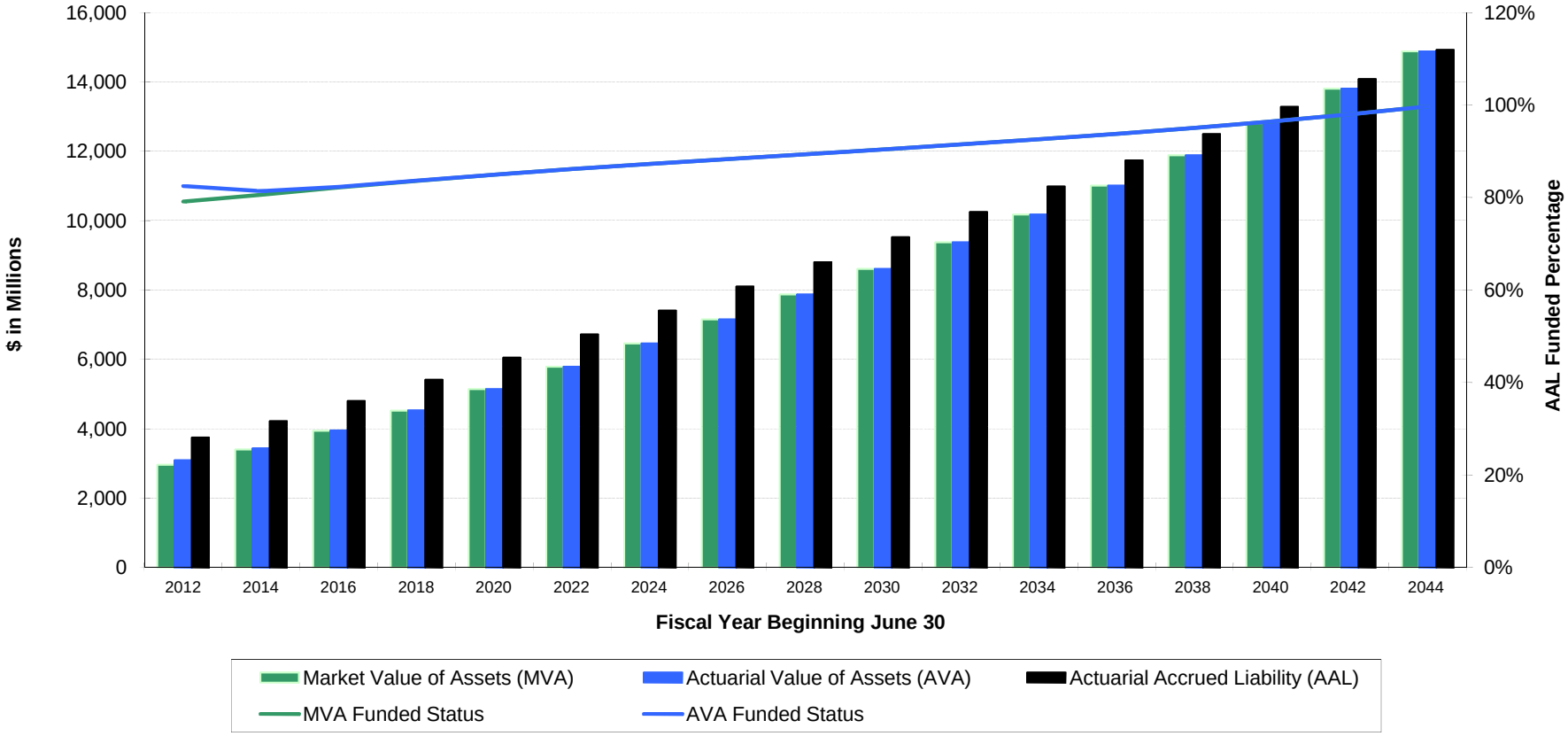
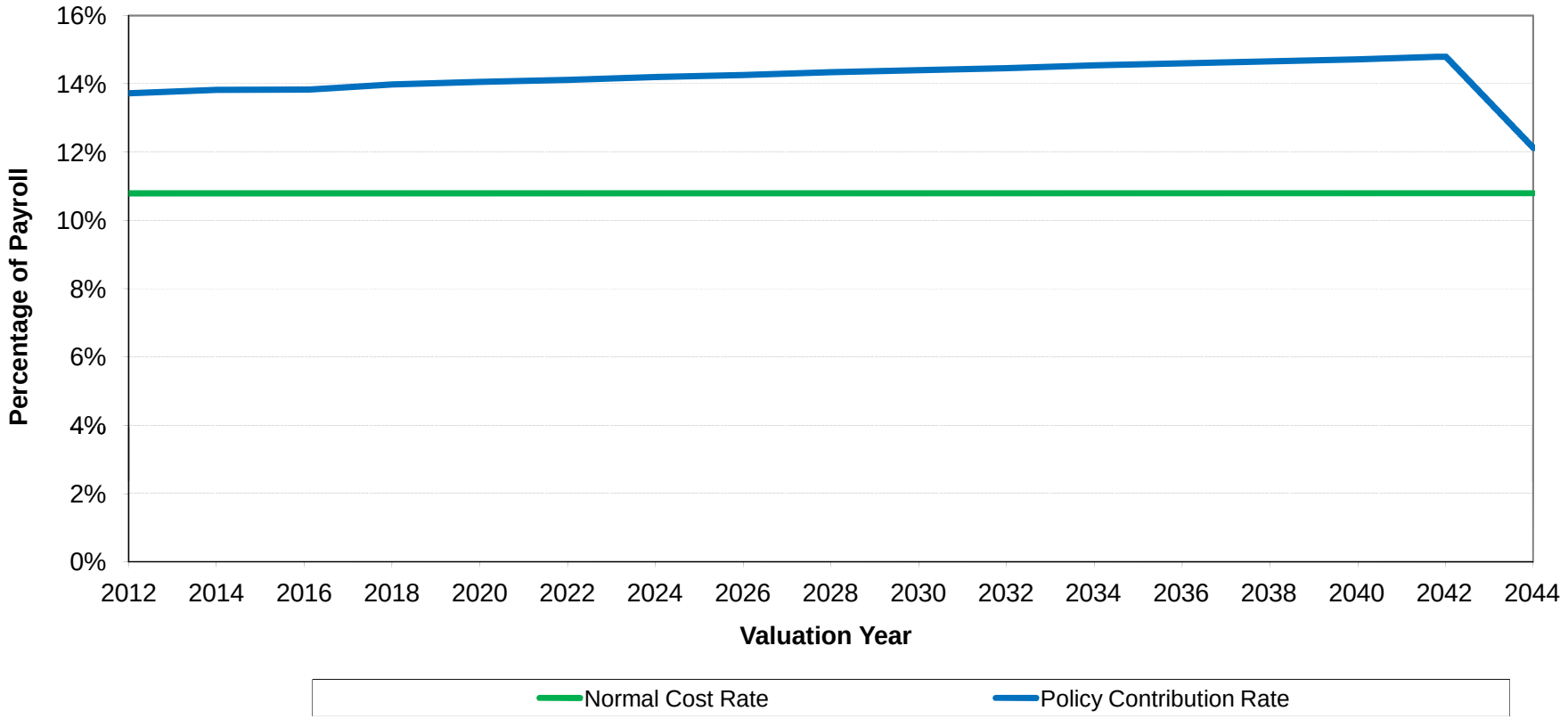


Exhibit III

Public Education Employees' Retirement System of Missouri
BASELINE
Projection of Total Contribution Rates



Public Education Employees' Retirement System of Missouri
SB 475
Projection of Funded Ratio

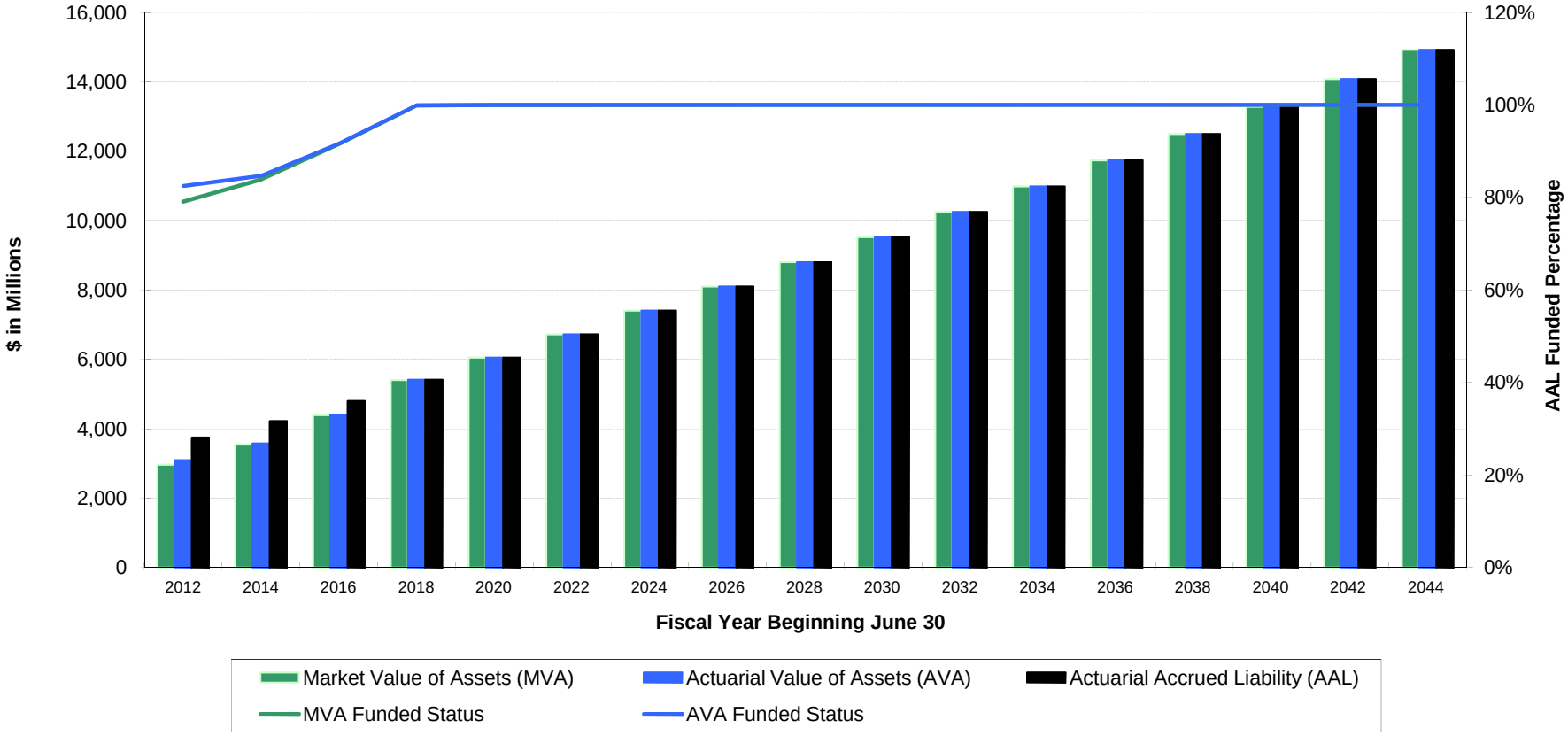
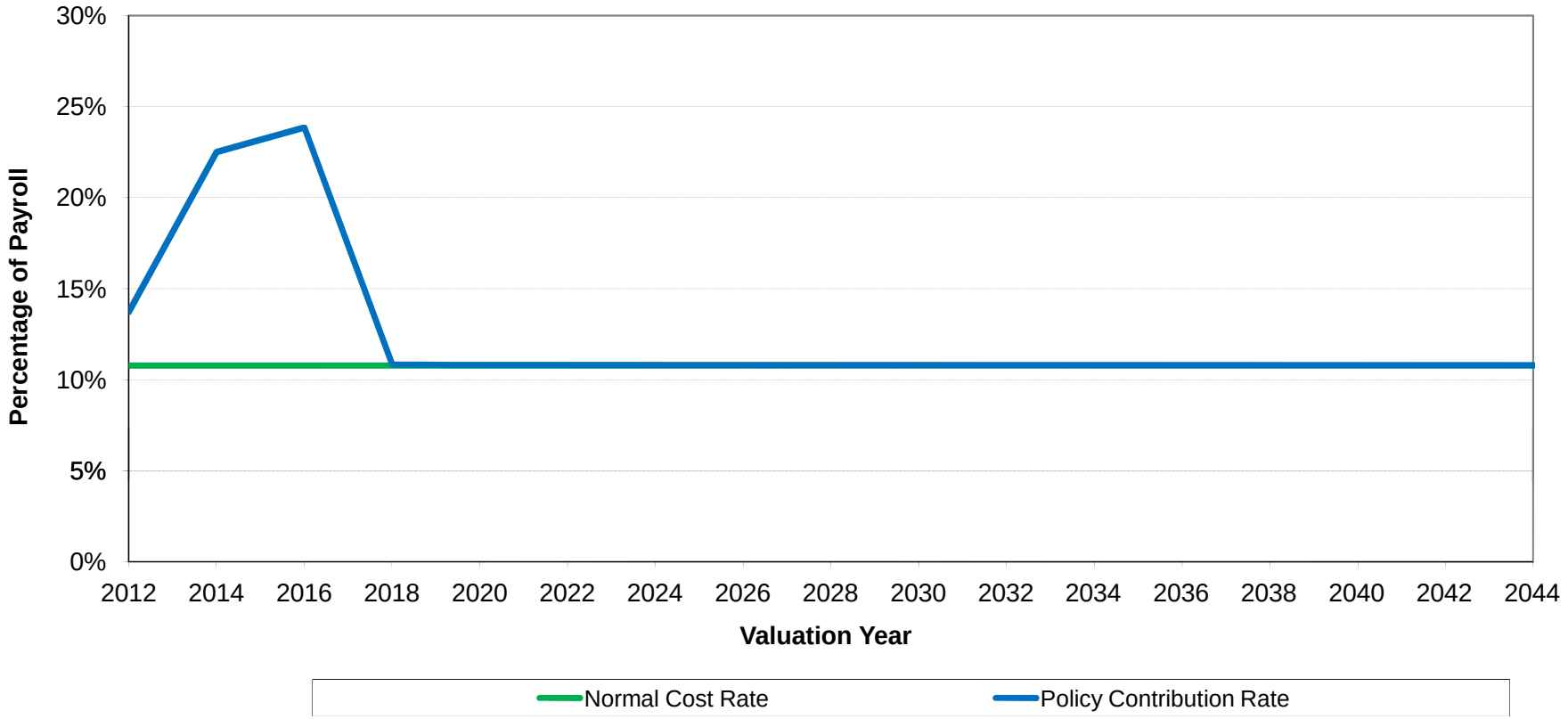


Exhibit V

Public Education Employees' Retirement System of Missouri
SB 475
Projection of Total Contribution Rates



ACTUARIAL ASSUMPTIONS

Inflation

Inflation is assumed to be 2.50% per annum.

Payroll Growth

Total payroll growth is assumed to be 3.75% per annum, consisting of 2.50% inflation, 0.75% additional inflation due to the inclusion of health care costs in pension earnings, and 0.50% of real wage growth.

Salary and Payroll Increases

Service	General Inflation	Health Care Inflation	Longevity	Total Increase
0	2.50%	0.75%	8.75%	12.00%
1	2.50%	0.75%	4.00%	7.25%
2	2.50%	0.75%	3.50%	6.75%
3	2.50%	0.75%	3.25%	6.50%
4	2.50%	0.75%	3.00%	6.25%
5	2.50%	0.75%	2.90%	6.15%
6	2.50%	0.75%	2.80%	6.05%
7	2.50%	0.75%	2.70%	5.95%
8	2.50%	0.75%	2.60%	5.85%
9	2.50%	0.75%	2.50%	5.75%
10	2.50%	0.75%	2.40%	5.65%
11	2.50%	0.75%	2.30%	5.55%
12	2.50%	0.75%	2.20%	5.45%
13	2.50%	0.75%	2.10%	5.35%
14	2.50%	0.75%	2.00%	5.25%
15	2.50%	0.75%	1.95%	5.20%
16	2.50%	0.75%	1.90%	5.15%
17	2.50%	0.75%	1.85%	5.10%
18	2.50%	0.75%	1.80%	5.05%
19	2.50%	0.75%	1.75%	5.00%
20+	2.50%	0.75%	1.75%	5.00%

Investment Return

It is assumed that investments of the System will return a yield of 8.00% per annum, net of system expenses (investment and administrative).

Cost of Living Adjustments

Cost of living adjustments ("COLA") are assumed to be 2.00% per year and compounded, based on the current policy of the Board to grant a 2.00% COLA whenever annual inflation, as measured by the CPI-U index for a fiscal year, increases between 0.00% and 5.00%.

The COLA assumption applies to service retirees and their beneficiaries. The COLA does not apply to the benefits for in-service death payable to spouses (where the spouse is over age 60), and does not apply to the spouse with children pre-retirement death benefit, the dependent children pre-retirement death benefit, or the dependent parent death benefit. The total lifetime COLA cannot exceed 80% of the original benefit. Future COLAs for current benefit recipients reflect actual cumulative adjustments granted at the time of valuation.

Mortality Rates

Mortality Rates for active and inactive members are based on the RP 2000 Mortality Table, set back one year for males and six years for females, then projected to 2016 using Scale AA. Illustrative rates per 1,000 members at various ages are as follows:

Active Member Mortality

Age	Male	Female
20	0.244	0.131
30	0.380	0.171
40	0.898	0.342
50	1.492	0.782
60	4.593	2.237
70	15.549	7.955

Mortality Rates for non-disabled retirees and beneficiaries are based on the RP 2000 Mortality Table, set forward one year for males and no setback for females, then projected to 2016 using Scale AA. Illustrative rates per 1,000 members at various ages are as follows:

Service Retiree, Beneficiary and Surviror Mortality

Age	Male	Female
40	1.004	0.554
50	1.831	1.274
60	5.930	4.665
70	19.292	15.452
80	61.340	41.002
90	187.360	125.502
100	352.933	233.696
110	400.000	364.617

Mortality Rates for disabled retirees are based on the RP 2000 Disabled Retiree Mortality Table. Illustrative rates per 1,000 members at various ages are as follows:

Disability Retiree Mortality

Age	Male	Female
40	22.571	7.450
50	28.975	11.535
60	42.042	21.839
70	62.583	37.635
80	109.372	72.312
90	183.408	140.049
100	344.556	237.467

Retirement Rates

Prior to July 1, 2013, retirement is assumed in accordance with the following rates per 1,000 eligible members:

	Service										
Age	< = 20	21	22	23	24	25	26	27	28	29	>= 30
<50	0	0	0	0	0	50	50	50	50	50	150
50	0	0	0	0	0	50	50	50	50	50	250
51	0	0	0	0	0	50	50	50	50	250	150
52	0	0	0	0	0	50	50	50	250	150	150
53	0	0	0	0	0	50	50	250	150	150	150
54	0	0	0	0	0	50	250	150	150	150	150
55	30	30	30	30	30	270	170	170	170	170	170
56	30	30	30	30	130	170	170	170	170	170	170
57	30	30	30	130	30	170	170	170	170	170	170
58	30	30	130	30	30	170	170	170	170	170	170
59	30	130	30	30	30	170	170	170	170	170	170
60	160	160	160	160	160	160	160	160	160	160	160
61	100	100	100	100	100	100	100	100	100	100	100
62	240	240	240	240	240	240	240	240	240	240	240
63	200	200	200	200	200	200	200	200	200	200	200
64	140	140	140	140	140	140	140	140	140	140	140
65	260	260	260	260	260	260	260	260	260	260	260
66	200	200	200	200	200	200	200	200	200	200	200
67	200	200	200	200	200	200	200	200	200	200	200
68	200	200	200	200	200	200	200	200	200	200	200
69	200	200	200	200	200	200	200	200	200	200	200
70	200	200	200	200	200	200	200	200	200	200	200
71	200	200	200	200	200	200	200	200	200	200	200
72	200	200	200	200	200	200	200	200	200	200	200
73	200	200	200	200	200	200	200	200	200	200	200
74	200	200	200	200	200	200	200	200	200	200	200
>=75	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

After June 30, 2013, retirement is assumed in accordance with the following rates per 1,000 eligible members:

	Service										
Age	< = 20	21	22	23	24	25	26	27	28	29	>= 30
<50	0	0	0	0	0	0	0	0	0	0	150
50	0	0	0	0	0	0	0	0	0	0	250
51	0	0	0	0	0	0	0	0	0	250	150
52	0	0	0	0	0	0	0	0	250	150	150
53	0	0	0	0	0	0	0	250	150	150	150
54	0	0	0	0	0	0	250	150	150	150	150
55	30	30	30	30	30	270	170	170	170	170	170
56	30	30	30	30	130	170	170	170	170	170	170
57	30	30	30	130	30	170	170	170	170	170	170
58	30	30	130	30	30	170	170	170	170	170	170
59	30	130	30	30	30	170	170	170	170	170	170
60	160	160	160	160	160	160	160	160	160	160	160
61	100	100	100	100	100	100	100	100	100	100	100
62	240	240	240	240	240	240	240	240	240	240	240
63	200	200	200	200	200	200	200	200	200	200	200
64	140	140	140	140	140	140	140	140	140	140	140
65	260	260	260	260	260	260	260	260	260	260	260
66	200	200	200	200	200	200	200	200	200	200	200
67	200	200	200	200	200	200	200	200	200	200	200
68	200	200	200	200	200	200	200	200	200	200	200
69	200	200	200	200	200	200	200	200	200	200	200
70	200	200	200	200	200	200	200	200	200	200	200
71	200	200	200	200	200	200	200	200	200	200	200
72	200	200	200	200	200	200	200	200	200	200	200
73	200	200	200	200	200	200	200	200	200	200	200
74	200	200	200	200	200	200	200	200	200	200	200
>=75	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Withdrawal Rates

Termination of membership prior to eligibility for retirement from all causes other than death and disability is assumed in accordance with the following illustrative rates per 1,000 members:

Active Member Withdrawal

Years of Service	Rate
0	300
1	220
2	150
3	120
4	100
5	81
10	48
15	33
20	18
25+	0

Disability Rates

Retirement for disability prior to age 60 is assumed in accordance with the following illustrative rates per 1,000 eligible members:

Active Member Disability

Age	Rates
30	0.080
35	0.160
40	0.320
45	0.640
50	1.040
55	1.680

Refund of Contributions

It is assumed that 80% of those leaving after earning 5 years of service leave their contributions in the fund and receive a vested benefit. The remaining 20% are assumed to take an immediate refund of their contributions, thus forfeiting their vested retirement benefit. If the present value of the deferred benefit is less than the member account balance, the member's account balance is valued.

It is assumed that 100% of those leaving prior to earning 5 years of service will take an immediate refund of their contributions.

Interest on Member Accounts

1.00% per annum.

Service Purchases

A 1.50% load is added to the Normal Cost to account for anticipated losses resulting from service purchases and reinstatements.

Provisions for Expenses

There is no specific provision for expenses. The implicit assumption is that administrative expenses are paid from investment income in excess of 8.00% per annum.

Dependent Assumptions

85% of male members and 70% of female members are assumed to be married.

Beneficiaries are assumed to be of the opposite sex from the member.

Male and Female members are assumed to be 5 years older than their beneficiary.

Return of Unused Member Account Balance

Under the single life annuity payment option, any unused balance of contributions and interest in the member account balance at the time of death is paid in a lump sum to a designated beneficiary. This benefit is approximated with a 3-year certain benefit.

Data Assumptions

Members without a date of birth provided are assumed to be 30 years old. Pensionable pay for valuation purposes is assumed to be the greater of the current year's salary, the previous year's salary and $5,000. Pensionable pay for active members hired in the current year is assumed to be the greater of annualized pay and $5,000. Pensionable pay for valuation purposes for inactive members is assumed to be the greater of the two most recent years of salary history provided and $5,000.

Projection Assumptions

Future economic and demographic experience is assumed to follow the valuation assumptions above, such that no gains or losses occur in future years. Active members who terminate, retire, become disabled, or die are assumed to be replaced such that the active member head count remains constant.

ACTUARIAL METHODS

Actuarial Cost Method

The actuarial cost method is Entry Age Normal - Level Percent of Payroll.

The normal cost is calculated separately for each active member and is equal to the level percentage of payroll needed as an annual contribution from entry age to retirement age to fund projected benefits. The actuarial accrued liability on any valuation date is the accumulated value of such normal costs from entry age to the valuation date.

Asset Valuation Method

The Actuarial Value of Assets is a smoothed value of assets. The actuarial value for a year is computed by taking the actuarial value at June 30 of the prior year, subtracting all expenses (including benefit payments), and adding contributions and expected investment return at 8% of actuarial value of assets. The difference between the actual returns at market value for the year and expected returns is determined. Twenty percent (20%) of that difference is added to the actuarial value along with corresponding amounts from each of the prior four years. The Actuarial Value of Assets was reset to market value at June 30, 2003.

Amortization of Unfunded Actuarial Accrued Liability

Gains and losses occurring from census experience different than assumed and assumption changes are amortized over a 30-year period as a level percent of payroll. A new gain or loss base is established each year based on the additional gain or loss during that year and that base is amortized over a new 30-year period. The purpose of the method is to give a smooth progression of the costs from year to year and, at the same time, provide for an orderly funding of the unfunded liabilities.

Increases or decreases in the Actuarial Accrued Liability caused by changes in the benefit provisions are amortized over 20 years, as determined in the 2007 session of the Legislature.

In the BASELINE projection, no future gains and losses are assumed to occur and all current amortization bases are paid down over their remaining amortization periods (up to 30 years)

In the SB 475 projection, no future gains and losses are assumed to occur and the amortization period for all current amortization bases is lowered to 5 years.

DISCLOSURES

This letter has been prepared pursuant to the engagement letter between PricewaterhouseCoopers LLP and PSRS and PEERS of Missouri, dated October 27, 2008.

In preparing the results presented in this letter, we have relied upon information provided to us by PSRS and PEERS of Missouri regarding plan provisions, plan participants, and benefit payments. While the scope of our engagement did not call for us to perform an audit or independent verification of this information, we have reviewed this information for reasonableness. The accuracy of the results presented in this letter is dependent upon the accuracy and completeness of the underlying information.

To the best of our knowledge, the individuals involved in this engagement have no relationship that may impair or appear to impair the objectivity of our work.

No statement in this letter is intended as a recommendation in favor, or in opposition, of the proposed legislation. Except as otherwise noted, potential impacts on other benefit plans were not considered.

The calculations are based upon assumptions regarding future events. However, the plan's long term costs will be determined by actual future events, which may differ materially from the assumptions that were made. The calculations are also based upon present and proposed plan provisions that are outlined in the letter. If you have reason to believe that the assumptions that were used are unreasonable, that the plan provisions are incorrectly described, that important plan provisions relevant to this proposal are not described, or that conditions have changed since the calculations were made, you should contact PSRS and PEERS of Missouri.

This document was not intended or written to be used, and it cannot be used, for the purpose of avoiding U.S. federal, state or local tax penalties. This includes penalties that may apply if the transaction that is the subject of this document is found to lack economic substance or fails to satisfy any other similar rule of law. This document is intended solely for the use and benefit of PSRS and PEERS of Missouri and not for reliance by any other person.

March 21, 2013

Mr. M. Steve Yoakum
Executive Director
PSRS and PEERS of Missouri
3210 West Truman Boulevard
Jefferson City, MO 65109

Re: Public School Retirement System of Missouri – Cost Impact of Senate Bill 475

Dear Steve:

We have estimated the financial impact of Senate Bill 475 on the Public School Retirement System of Missouri ("PSRS"), which:

1. Requires PSRS to achieve and maintain a funded ratio of assets to liabilities, as defined in section 105.660, equalling one hundred percent by the first plan year ending after January 1, 2018 (i.e. June 30, 2018).

2. Requires that no adjustment to PSRS, which has the effect of increasing liabilities of the Plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual, shall take effect during any plan year if the funding for such year is less than one hundred percent or would be less than one hundred percent after taking into account such adjustment.

3. Requires that if the PSRS funded ratio falls below eighty percent, benefit accruals under the plan shall cease as of the valuation date for the plan year.

4. Provides that when the annual plan investment rate of return falls below zero percent then neither PSRS, the governing body of PSRS, nor its employees shall be held civilly liable for loss or depreciation of funds or for failure to maintain the statutory retirement plan at a one hundred percent funded ratio.

For the five-year period beginning July 1, 2013 and ending June 30, 2018, we estimate the additional cost of PSRS due to the Bill to be approximately **$7.0 billion**. As a percentage of payroll, the total contribution rate would increase to as much as **59.44% of payroll**, or 29.72% for both members and employers if split evenly.

Financial Impact

The first item noted above has the most significant impact on member and employer cost. In effect, the amortization period for the unfunded actuarial accrued liability ("UAAL") is reduced to five years. This is a significantly shorter period than the 30-year method currently used, where a new 30-year amortization base (equal to the prior year gain or loss from experience, assumption changes and method changes) is established each year. The result is a significant increase in annual cost over the next five years, followed by an annual savings for the next 25 years. See Exhibit I for a summary of the results.

Enclosed are several exhibits illustrating the projected financial impact of the Bill over the next 30 years and summarizing the assumptions and methods used in our analysis, as follows:

- Exhibit I – Summary results of the projected cost of PSRS over 30 years.

- Exhibit II – 30-year projection of the funded ratio for PSRS under the current UAAL amortization method.
- Exhibit III – 30-year projection of the total contribution rate for PSRS under the current UAAL amortization method.
- Exhibit IV – 30-year projection of the funded ratio for PSRS under the proposed UAAL amortization method of SB 475.
- Exhibit V – 30-year projection of the total contribution rate for PSRS under the proposed UAAL amortization method of SB 475.
- Exhibit VI – Summary of actuarial assumptions and methods used in our analysis.
- Exhibit VII – Certain disclosures regarding our analysis.

Please note the following as you review the enclosed exhibits:

- We have assumed that future experience will happen as assumed in the valuation assumptions, including 8.00% investment returns each year in the future.
- We have assumed that the member and employer contribution rates would be adjusted beginning July 1, 2013 to amortize the UAAL over 5 years if SB 475 is passed.
- We have assumed that there would be no adjustments to PSRS during the projection period that would have the effect of increasing liabilities of the Plan by increasing benefits, establishing new benefits, or changing the rate of benefit accrual.
- The PSRS funded ratio is expected to fall below 80% at 6/30/2013, but then increase to more than 80% for the remainder of the projection period. Our analysis assumes any benefit accruals lost because of a freeze during fiscal 2014 would be reinstated when the funded ratio returns to 80%, such that there is ultimately no loss in benefits for members. Members and employers were assumed to contribute during fiscal 2014 while benefit accruals are frozen.
- The total contribution requirement in future years is assumed to be shared equally by members and employers as is currently required.

Conclusions

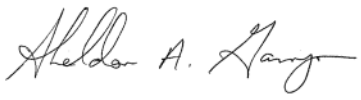
- Accelerating the UAAL amortization to a period of five years results in a doubling of the contribution rates for the next five years. This approach does not provide intergenerational equity among members. A member who retires in the coming years would have contributed significantly toward paying off the UAAL, whereas a member who retires several years from now will have paid only the normal cost rate for much of their career.
- In reality, investment returns and demographic experience gains and losses will occur in future years. The requirement to "maintain a funded ratio" of 100% will result in year-over-year volatility in the contribution rates as all gains and losses will need to be reflected in the contributions during the following year. The method of smoothing investment gains and losses over five years in the actuarial value of assets will help to mitigate some of the volatility.

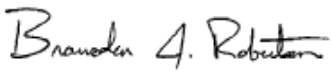
- To the extent members continue to share equally in the contribution requirement, accelerating the funding of the UAAL would require members to contribute more than the normal cost (19.04% of pay) of the benefits. This may result in situations where the accumulated value of a member's contributions is greater than the value of the annuity benefit provided by the benefit formula.

- The provision of the Bill concerning the freeze of benefit accruals when the funded ratio falls below 80% should be clarified with regard to whether benefit accruals resume when the funded ratio returns to 80%, whether members continue to contribute during the freeze period, and whether lost accruals are reinstated when the funded ratio returns to 80%.

Please call with any questions or if you require additional information.

Sincerely,





Sheldon Gamzon, FSA, EA, MAAA

Brandon Robertson, ASA, EA, MAAA

Enclosure

cc: Maria Cauwenbergh Walden - PSRS
Mary Hiatte, PSRS
Becky Brenza, PwC

Exhibit I

Public School Retirement System
SB 475 Analysis
($ in Millions)

		BASELINE Current Contribution Policy					SB 475 Contribution Policy					Difference	
Fiscal Year Beginning July 1	Total Payroll	Member Contribution Rate	Employer Contribution Rate	Total Contribution Rate	Total Contribution Amount	Funded Percentage (AVA / AAL)	Member Contribution Rate	Employer Contribution Rate	Total Contribution Rate	Total Contribution Amount	Funded Percentage (AVA / AAL)	Total Contribution Amount	Present Value of Contribution Difference
2012	4,379	14.50%	14.50%	29.00%	$1,270	82%	14.50%	14.50%	29.00%	$1,270	82%	$0	$0
2013	4,534	14.50%	14.50%	29.00%	$1,315	79%	29.20%	29.20%	58.40%	$2,648	79%	$1,333	$1,192
2014	4,693	14.64%	14.64%	29.28%	$1,374	80%	28.42%	28.42%	56.84%	$2,668	83%	$1,294	$1,079
2015	4,859	14.64%	14.64%	29.28%	$1,423	81%	27.76%	27.76%	55.52%	$2,698	88%	$1,275	$988
2016	5,031	14.64%	14.64%	29.28%	$1,473	80%	29.72%	29.72%	59.44%	$2,990	91%	$1,517	$1,093
2017	5,206	14.64%	14.64%	29.28%	$1,524	81%	29.67%	29.67%	59.34%	$3,089	95%	$1,565	$1,049
2018	5,384	14.64%	14.64%	29.28%	$1,576	81%	9.52%	9.52%	19.04%	$1,025	100%	($551)	($343)
2019	5,566	14.64%	14.64%	29.28%	$1,630	82%	9.52%	9.52%	19.04%	$1,060	100%	($570)	($330)
2020	5,752	14.64%	14.64%	29.28%	$1,684	83%	9.52%	9.52%	19.04%	$1,095	100%	($589)	($317)
2021	5,937	14.64%	14.64%	29.28%	$1,738	83%	9.52%	9.52%	19.04%	$1,130	100%	($608)	($304)
2022	6,123	14.64%	14.64%	29.28%	$1,793	84%	9.52%	9.52%	19.04%	$1,166	100%	($627)	($292)
2023	6,308	14.64%	14.64%	29.28%	$1,847	85%	9.52%	9.52%	19.04%	$1,201	100%	($646)	($280)
2024	6,493	14.64%	14.64%	29.28%	$1,901	85%	9.52%	9.52%	19.04%	$1,236	100%	($665)	($268)
2025	6,676	14.64%	14.64%	29.28%	$1,955	86%	9.52%	9.52%	19.04%	$1,271	100%	($684)	($256)
2026	6,857	14.64%	14.64%	29.28%	$2,008	86%	9.52%	9.52%	19.04%	$1,306	100%	($702)	($244)
2027	7,040	14.64%	14.64%	29.28%	$2,061	87%	9.52%	9.52%	19.04%	$1,340	100%	($721)	($233)
2028	7,224	14.64%	14.64%	29.28%	$2,115	88%	9.52%	9.52%	19.04%	$1,375	100%	($740)	($223)
2029	7,407	14.64%	14.64%	29.28%	$2,169	88%	9.52%	9.52%	19.04%	$1,410	100%	($759)	($212)
2030	7,591	14.64%	14.64%	29.28%	$2,223	89%	9.52%	9.52%	19.04%	$1,445	100%	($778)	($202)
2031	7,776	14.64%	14.64%	29.28%	$2,277	90%	9.52%	9.52%	19.04%	$1,481	100%	($796)	($192)
2032	7,963	14.64%	14.64%	29.28%	$2,332	90%	9.52%	9.52%	19.04%	$1,516	100%	($816)	($183)
2033	8,156	14.64%	14.64%	29.28%	$2,388	91%	9.52%	9.52%	19.04%	$1,553	100%	($835)	($175)
2034	8,352	14.64%	14.64%	29.28%	$2,445	92%	9.52%	9.52%	19.04%	$1,590	100%	($855)	($166)
2035	8,547	14.64%	14.64%	29.28%	$2,503	93%	9.52%	9.52%	19.04%	$1,627	100%	($876)	($158)
2036	8,746	14.64%	14.64%	29.28%	$2,561	93%	9.52%	9.52%	19.04%	$1,665	100%	($896)	($151)
2037	8,946	14.64%	14.64%	29.28%	$2,620	94%	9.52%	9.52%	19.04%	$1,703	100%	($917)	($143)
2038	9,157	14.64%	14.64%	29.28%	$2,681	95%	9.52%	9.52%	19.04%	$1,743	100%	($938)	($136)
2039	9,390	14.64%	14.64%	29.28%	$2,749	96%	9.52%	9.52%	19.04%	$1,788	100%	($961)	($130)
2040	9,635	14.64%	14.64%	29.28%	$2,821	97%	9.52%	9.52%	19.04%	$1,835	100%	($986)	($124)
2041	9,889	14.64%	14.64%	29.28%	$2,896	98%	9.52%	9.52%	19.04%	$1,883	100%	($1,013)	($118)
2042	10,176	14.64%	14.64%	29.28%	$2,979	99%	9.52%	9.52%	19.04%	$1,937	100%	($1,042)	($113)
2043	10,468	14.64%	14.64%	29.28%	$3,065	100%	9.52%	9.52%	19.04%	$1,993	100%	($1,072)	($108)
Total					$67,396					$53,737		($13,659)	$0

Public School Retirement System of Missouri
BASELINE
Projection of Funded Ratio

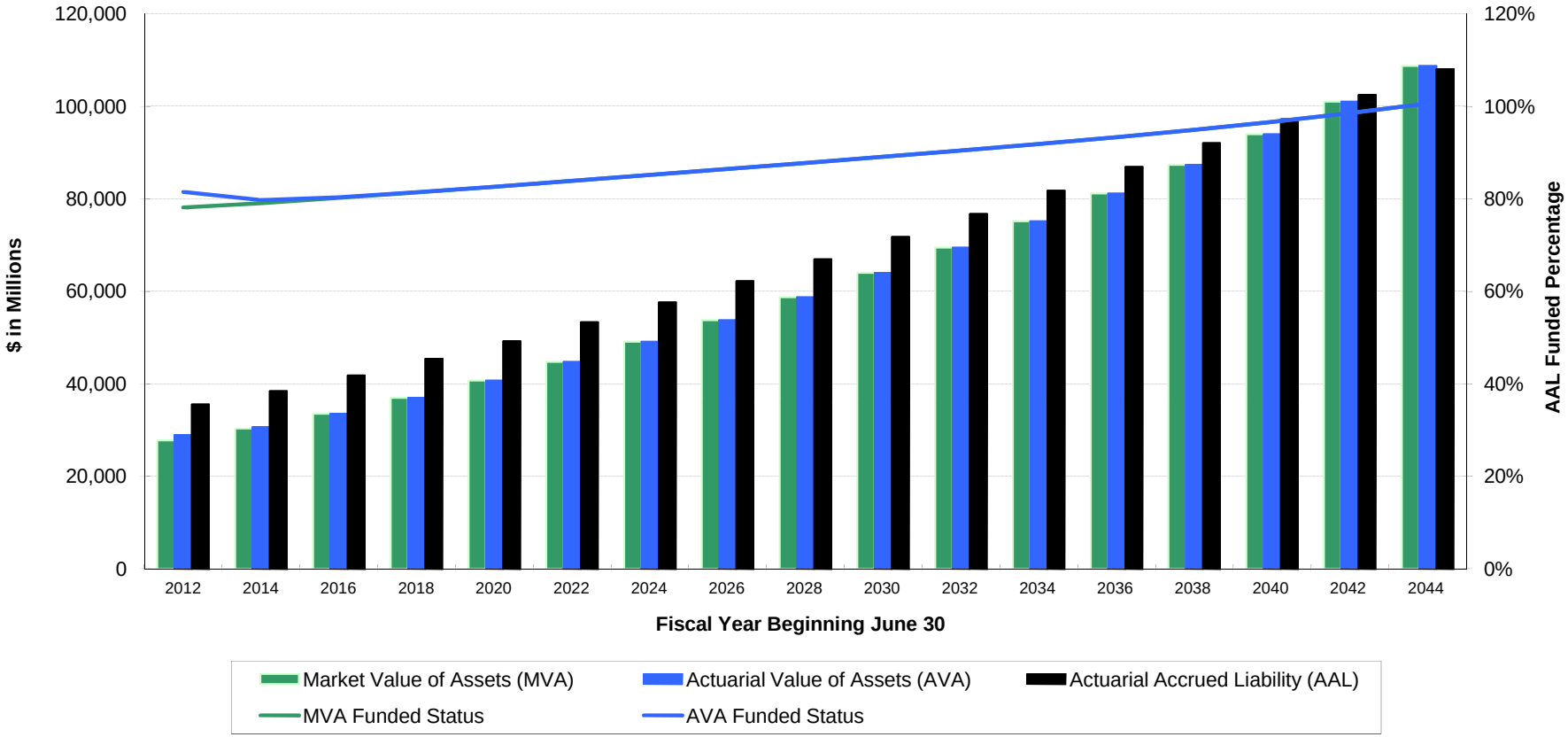
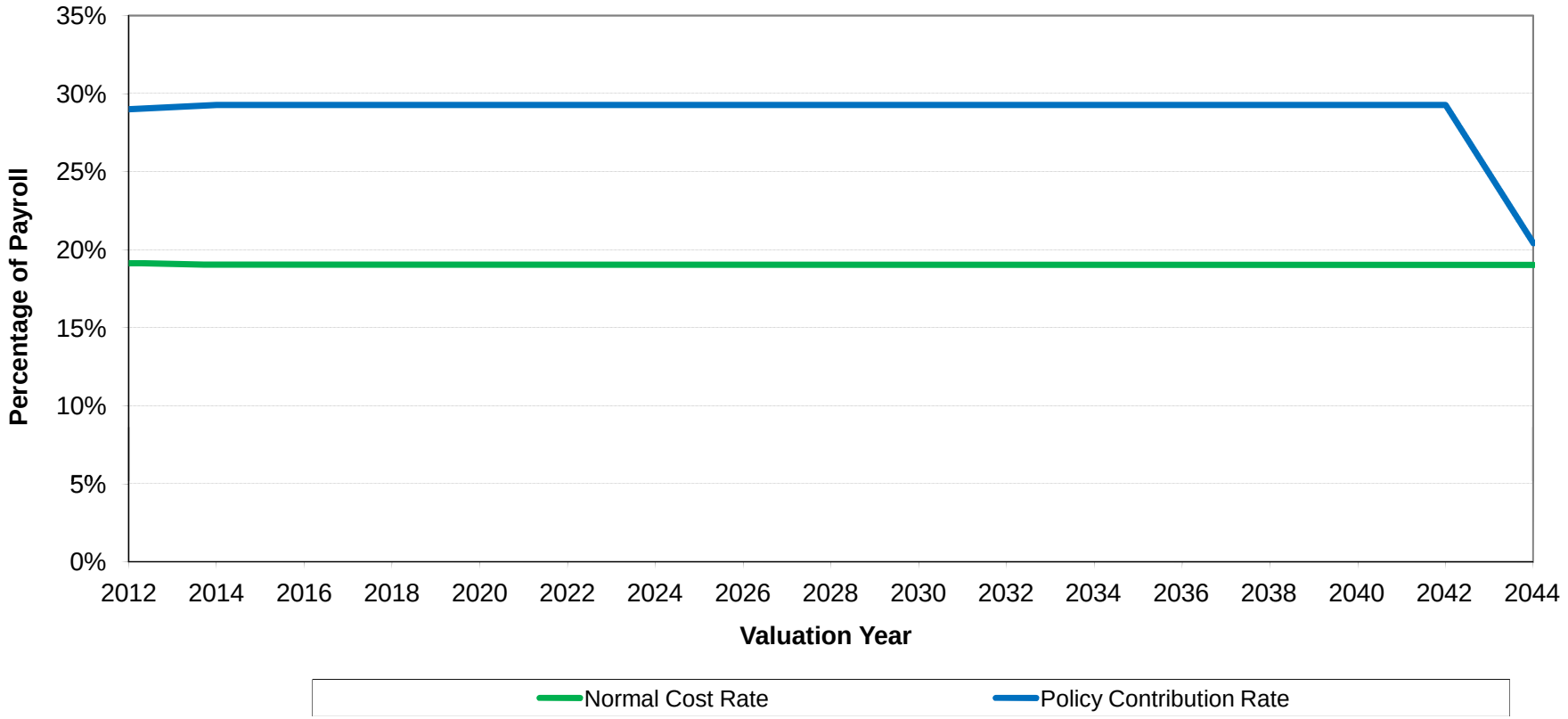


Exhibit III

Public School Retirement System of Missouri
BASELINE
Projection of Total Contribution Rates



Public School Retirement System of Missouri
SB 475
Projection of Funded Ratio

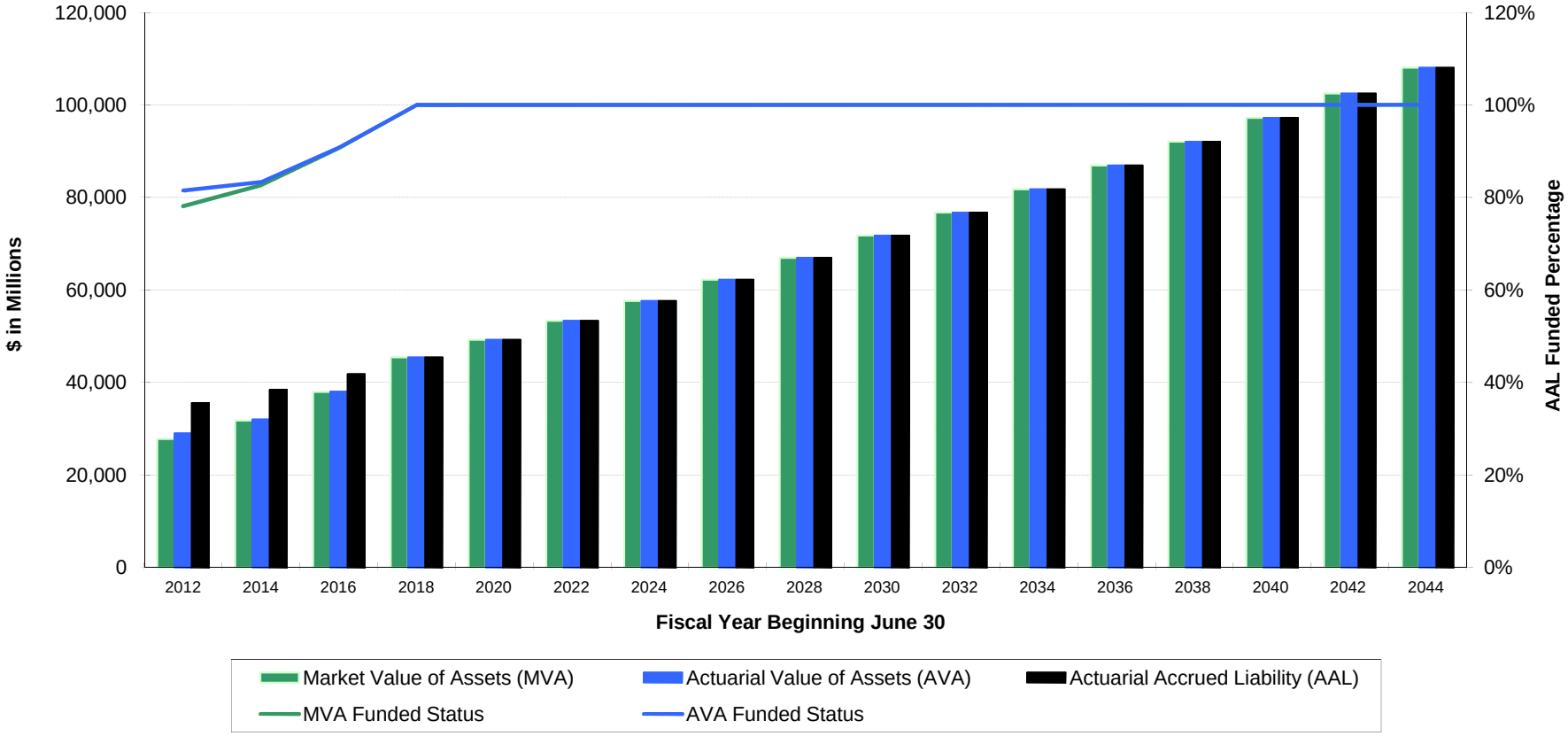
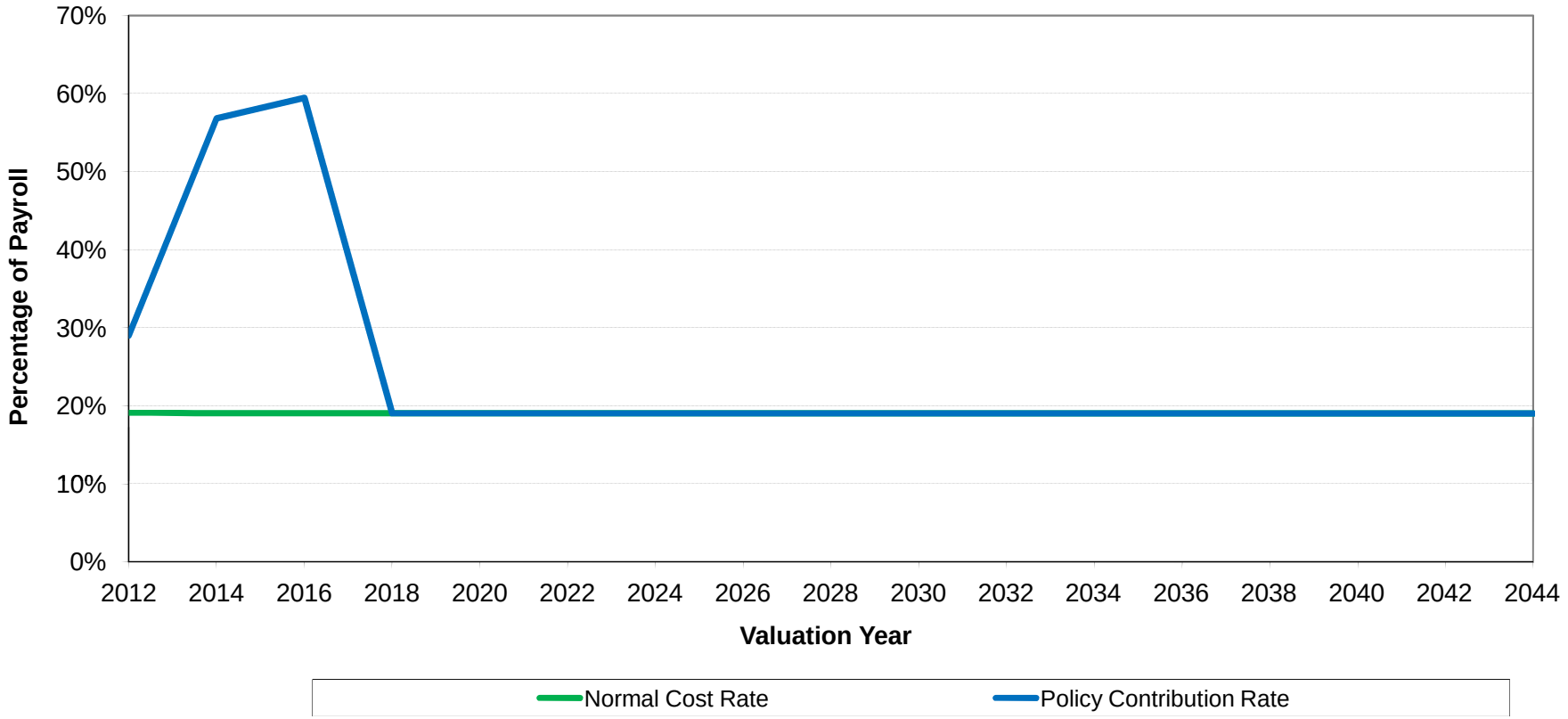


Exhibit V

Public School Retirement System of Missouri
SB 475
Projection of Total Contribution Rates



ACTUARIAL ASSUMPTIONS

Inflation

Inflation is assumed to be 2.50% per annum.

Payroll Growth

Total payroll growth is assumed to be 3.50% per annum, consisting of 2.50% inflation, 0.50% additional inflation due to the inclusion of health care costs in pension earnings, and 0.50% of real wage growth.

Individual Salary Growth

Salaries are assumed to increase each year with general inflation of 2.50%, plus health care inflation of 0.50% (since health care costs are included in pension earnings), plus a longevity adjustment that accounts for merit, promotion, and other real wage growth.

Service	Inflation	Inflation	Longevity	Increase
0	2.50%	0.50%	7.00%	10.00%
1 - 4	2.50%	0.50%	4.00%	7.00%
5	2.50%	0.50%	3.80%	6.80%
6	2.50%	0.50%	3.60%	6.60%
7	2.50%	0.50%	3.40%	6.40%
8	2.50%	0.50%	3.20%	6.20%
9	2.50%	0.50%	3.00%	6.00%
10	2.50%	0.50%	2.80%	5.80%
11	2.50%	0.50%	2.60%	5.60%
12	2.50%	0.50%	2.40%	5.40%
13	2.50%	0.50%	2.20%	5.20%
14	2.50%	0.50%	2.00%	5.00%
15	2.50%	0.50%	2.00%	5.00%
16	2.50%	0.50%	1.90%	4.90%
17	2.50%	0.50%	1.90%	4.90%
18	2.50%	0.50%	1.80%	4.80%
19	2.50%	0.50%	1.80%	4.80%
20	2.50%	0.50%	1.70%	4.70%
21	2.50%	0.50%	1.70%	4.70%
22	2.50%	0.50%	1.60%	4.60%
23	2.50%	0.50%	1.60%	4.60%
24	2.50%	0.50%	1.50%	4.50%
25	2.50%	0.50%	1.50%	4.50%
26	2.50%	0.50%	1.40%	4.40%
27	2.50%	0.50%	1.30%	4.30%
28	2.50%	0.50%	1.20%	4.20%
29	2.50%	0.50%	1.10%	4.10%
30+	2.50%	0.50%	1.00%	4.00%

Investment Return

It is assumed that investments of the System will return a yield of 8.00% per annum, net of system expenses (investment and administrative).

Cost of Living Adjustments

Cost of living adjustments ("COLA") are assumed to be 2.00% per year and compounded, based on the current policy of the Board to grant a 2.00% COLA whenever annual inflation, as measured by the CPI-U index for a fiscal year, increases between 0.00% and 5.00%.

The COLA assumption applies to service retirees and their beneficiaries. The COLA does not apply to the benefits for in-service death payable to spouses (where the spouse is over age 60), and does not apply to the spouse with children pre-retirement death benefit, the dependent children pre-retirement death benefit, or the dependent parent death benefit. The total lifetime COLA cannot exceed 80% of the original benefit. Future COLAs for current benefit recipients reflect actual cumulative adjustments granted at the time of valuation.

Mortality Rates

Mortality Rates for active members are based on the RP 2000 Mortality Table, set back one year for males and six years for females, then projected to 2016 using Scale AA. Illustrative rates per 1,000 members at various ages are as follows:

Active Member Mortality

Age	Male	Female
20	0.244	0.131
30	0.38	0.171
40	0.898	0.171
50	1.492	0.782
60	4.593	2.237
70	15.549	7.955

Mortality Rates for non-disabled retirees and beneficiaries are based on the RP 2000 Mortality Table, set back one year for both males and females, then projected to 2016 using Scale AA. Illustrative rates per 1,000 members at various ages are as follows:

Service Retiree, Beneficiary and Surviror Mortality

Age	Male	Female
40	0.898	0.509
50	1.492	1.178
60	4.593	4.099
70	15.549	13.715
80	49.322	37.094
90	156.083	113.562
100	324.963	227.712
110	400	351.544

Mortality Rates for disabled retirees are based on the RP 2000 Disabled Retiree Mortality Table. Illustrative rates per 1,000 members at various ages are as follows:

Disability Retiree Mortality

Age	Male	Female
40	22.571	7.450
50	28.975	11.535
60	42.042	21.839
70	62.583	37.635
80	109.372	72.312
90	183.408	140.049
100	344.556	237.467
110	400.000	364.617

Retirement Rates

Prior to July 1, 2013, retirement is assumed in accordance with the following rates per 1,000 eligible members:

	Service											
Age	< = 20	21	22	23	24	25	26	27	28	29	30	> = 31
<= 50	0	0	0	0	0	50	50	50	50	50	200	400
51	0	0	0	0	0	50	50	50	50	200	200	400
52	0	0	0	0	0	50	50	50	200	200	200	400
53	0	0	0	0	0	50	50	300	200	200	200	400
54	0	0	0	0	0	50	300	200	200	200	200	400
55	50	50	50	50	50	400	200	200	200	200	200	400
56	50	50	50	50	400	200	200	200	200	200	200	400
57	50	50	50	400	200	200	200	200	200	200	200	400
58	50	50	400	200	200	200	200	200	200	200	200	400
59	50	400	200	200	200	200	200	200	200	200	200	400
60	150	150	150	150	150	200	200	200	200	200	200	400
61	150	150	150	150	150	200	200	200	200	200	200	400
62	150	150	150	150	150	200	200	200	200	200	200	400
63	150	150	150	150	150	200	200	200	200	200	200	400
64	150	150	150	150	150	200	200	200	200	200	200	400
65	250	250	250	250	250	400	400	400	400	400	400	400
66	250	250	250	250	250	300	300	300	300	300	300	400
67	250	250	250	250	250	300	300	300	300	300	300	400
68	250	250	250	250	250	300	300	300	300	300	300	400
69	250	250	250	250	250	300	300	300	300	300	300	400
>= 70	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

After June 30, 2013, retirement is assumed in accordance with the following rates per 1,000 eligible members:

	Service											
Age	< = 20	21	22	23	24	25	26	27	28	29	30	> = 31
<= 50	0	0	0	0	0	0	0	0	0	0	450	450
51	0	0	0	0	0	0	0	0	0	200	450	450
52	0	0	0	0	0	0	0	0	200	200	450	450
53	0	0	0	0	0	0	0	300	200	200	450	450
54	0	0	0	0	0	0	300	200	200	200	450	450
55	50	50	50	50	50	400	200	200	200	200	450	450
56	50	50	50	50	400	200	200	200	200	200	450	450
57	50	50	50	400	200	200	200	200	200	200	450	450
58	50	50	400	200	200	200	200	200	200	200	450	450
59	50	400	200	200	200	200	200	200	200	200	450	450
60	150	150	150	150	150	200	200	200	200	200	450	450
61	150	150	150	150	150	200	200	200	200	200	450	450
62	150	150	150	150	150	200	200	200	200	200	450	450
63	150	150	150	150	150	200	200	200	200	200	450	450
64	150	150	150	150	150	200	200	200	200	200	450	450
65	250	250	250	250	250	400	400	400	400	400	450	450
66	250	250	250	250	250	300	300	300	300	300	450	450
67	250	250	250	250	250	300	300	300	300	300	450	450
68	250	250	250	250	250	300	300	300	300	300	450	450
69	250	250	250	250	250	300	300	300	300	300	450	450
>= 70	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Withdrawal Rates

Termination of membership prior to eligibility for retirement from all causes other than death and disability is assumed in accordance with the following illustrative rates per 1,000 members:

Active Member Withdrawal

Years of Service	Rate
0	190
1	105
2	85
3	73
4	62
5	52
10	23
15	12
20	5
25+	0

Disability Rates

Retirement for disability prior to age 60 is assumed in accordance with the following illustrative rates per 1,000 eligible members:

Active Member Disability

Age	Rates
25	0.017
30	0.080
35	0.160
40	0.320
45	0.610
50	0.960
55	1.310

Refund of Contributions

It is assumed that 88% of those leaving after earning 5 years of service leave their contributions in the fund and receive a vested benefit. If the present value of the deferred benefit is less than the member account balance, the member's account balance is valued. The remaining 12% are assumed to take an immediate refund of their contributions, thus forfeiting their vested retirement benefit.

It is assumed that 100% of those leaving prior to earning 5 years of service will take an immediate refund of their contributions.

Interest on Member Accounts

1.00% per annum.

Service Purchases

A 2.00% load is added to the Normal Cost to account for anticipated losses resulting from service purchases and reinstatements.

Provisions for Expenses

There is no specific provision for expenses. The implicit assumption is that administrative expenses are paid from investment income in excess of 8.00% per annum.

Dependent Assumptions

80% of male members and 70% of female members are assumed to be married.

Beneficiaries are assumed to be of the opposite sex from the member.

Male and Female members are assumed to be 4 years older than their beneficiary.

Survivor Benefits

All active members under age 50 are assumed to have 2 dependent children. Each child is assumed to receive payments of $860 per month for 18 years if the member is under age 32, and grading down to 0 years if the member is age 50.

Return of Unused Member Account Balance

Under the single life annuity payment option, any unused balance of contributions and interest in the member account balance at the time of death is paid in a lump sum to a designated beneficiary. This benefit is approximated with a 5-year certain benefit.

Data Assumptions

Members without a date of birth provided are assumed to be 30 years old. Pensionable pay for members who did not earn service during the past year is assumed to be the greater of the current year's salary, the previous year's salary and $10,000. Pensionable pay for other active members is assumed to be the greater of annualized pay and $10,000.

Projection Assumptions

Future economic and demographic experience is assumed to follow the valuation assumptions above, such that no gains or losses occur in future years. Active members who terminate, retire, become disabled, or die are assumed to be replaced such that the active member head count remains constant.

Exhibit VI

ACTUARIAL METHODS

Actuarial Cost Method

The actuarial cost method is Entry Age Normal - Level Percent of Payroll.

The normal cost is calculated separately for each active member and is equal to the level percentage of payroll needed as an annual contribution from entry age to retirement age to fund projected benefits. The actuarial accrued liability on any valuation date is the accumulated value of such normal costs from entry age to the valuation date.

Asset Valuation Method

The Actuarial Value of Assets is a smoothed value of assets. The actuarial value for a year is computed by taking the actuarial value at June 30 of the prior year, subtracting all expenses (including benefit payments), and adding contributions and expected investment return at 8% of actuarial value of assets. The difference between the actual returns at market value for the year and expected returns is determined. Twenty percent (20%) of that difference is added to the actuarial value along with corresponding amounts from each of the prior four years. The Actuarial Value of Assets was reset to market value at June 30, 2003.

Amortization of Unfunded Actuarial Accrued Liability

Gains and losses occurring from census experience different than assumed and assumption changes are amortized over a 30-year period as a level percent of payroll. A new gain or loss base is established each year based on the additional gain or loss during that year and that base is amortized over a new 30-year period. The purpose of the method is to give a smooth progression of the costs from year to year and, at the same time, provide for an orderly funding of the unfunded liabilities.

Increases or decreases in the Actuarial Accrued Liability caused by changes in the benefit provisions are amortized over 20 years, as determined in the 2007 session of the Legislature.

In the BASELINE projection, no future gains and losses are assumed to occur and all current amortization bases are paid down over their remaining amortization periods (up to 30 years)

In the SB 475 projection, no future gains and losses are assumed to occur and the amortization period for all current amortization bases is lowered to 5 years.

DISCLOSURES

This letter has been prepared pursuant to the engagement letter between PricewaterhouseCoopers LLP and PSRS and PEERS of Missouri, dated October 27, 2008.

In preparing the results presented in this letter, we have relied upon information provided to us by PSRS and PEERS of Missouri regarding plan provisions, plan participants, and benefit payments. While the scope of our engagement did not call for us to perform an audit or independent verification of this information, we have reviewed this information for reasonableness. The accuracy of the results presented in this letter is dependent upon the accuracy and completeness of the underlying information.

To the best of our knowledge, the individuals involved in this engagement have no relationship that may impair or appear to impair the objectivity of our work.

No statement in this letter is intended as a recommendation in favor, or in opposition, of the proposed legislation. Except as otherwise noted, potential impacts on other benefit plans were not considered.

The calculations are based upon assumptions regarding future events. However, the plan's long term costs will be determined by actual future events, which may differ materially from the assumptions that were made. The calculations are also based upon present and proposed plan provisions that are outlined in the letter. If you have reason to believe that the assumptions that were used are unreasonable, that the plan provisions are incorrectly described, that important plan provisions relevant to this proposal are not described, or that conditions have changed since the calculations were made, you should contact PSRS and PEERS of Missouri.

This document was not intended or written to be used, and it cannot be used, for the purpose of avoiding U.S. federal, state or local tax penalties. This includes penalties that may apply if the transaction that is the subject of this document is found to lack economic substance or fails to satisfy any other similar rule of law. This document is intended solely for the use and benefit of PSRS and PEERS of Missouri and not for reliance by any other person.

OVERSIGHT DIVISION
Committee on Legislative Research
Room 132, State Capitol
Jefferson City, MO 65101
573/751-4143

Local Government Agency: Public School Retirement System of the City of St. Louis (PSRSSTL)

Date: March 5, 2013

Re: LR# 1807S.01I Bill# SB475

Preparer: Andrew Clark, Executive Director

Preparer's Phone Number: 314-533-3883

Oversight Analyst Name: Lauren Ordway, Fiscal Analyst

UNDERSTANDING OF SB475

SB475 applies to fifteen (15) "statutory retirement plans" and imposes a number of onerous and conflicting requirements on these plans. First, the enumerated plans would be required to achieve a 100% funded ratio by January 1, 2018. Related to that requirement, SB475 would require the plans to adopt "rules and regulations necessary to carry out" that requirement. Further, a plan would not be permitted to implement any benefit change that resulted in increased liabilities (contributions) unless the plan would be at least one hundred percent (100%) funded *after* the benefit change went into effect. Second, SB475 would halt benefit accruals if a plan became less than eighty percent (80%) funded in any plan year. Third, SB475 would insulate the plans, their governing bodies and employees, from liability if the investment return of the plan falls below zero percent (0%), or if the plan does remain one hundred percent (100%) funded.

DISCUSSION AND ANALYSIS

PSRSSTL believes that SB475 constitutes a "substantial proposed change" in future benefits within the meaning of § 105.660(10) RSMo. Since SB475 does not include a Cost Statement as required by § 105.665 RSMo. before final legislative action may be taken, the additional costs of

the proposed legislation are currently unknown. The specific provisions of SB475 will be addressed further below.

1. One Hundred Percent (100%) Funding By January 1, 2018

SB475 would impose a laudable, yet impossible requirement upon the plans. The funded ratio of a plan is a function of contributions and investment returns, as well as the assumptions adopted by the plans' trustees. The plans, however, cannot predict the market in anything approaching the level of precision which would allow for a *guarantee* of one hundred percent (100%) funding by June 1, 2018. The costs associated with an attempt at such a result would be large, immediate and continuous. In addition, the Retirement System believes that the rulemaking and additional actuarial and legal expenses associated with the proposal may be unconstitutional in violation of the Hancock Amendment.

2. Limitations on Benefit Increases

SB475 would prohibit an "adjustment to a statutory plan" (meaning benefit increases, new benefits or changes to accrual rates) in any plan year unless the plan was at least 100% funded before such adjustment and will not be less than 100% funded after such adjustment. With respect to the Retirement System, this proposal is in direct conflict with § 169.471.2. Section 169.471.2 prohibits benefit increases unless they meet the following requirements: (1) they do not result in additional employer or employee contributions; (2) they are determined by the Retirement System's actuary to be actuarially sound; and (3) the Retirement System is at least 80% funded before the benefit increase and will not be less than 75% funded after the benefit increase. SB475 does not address this conflict.

3. Suspension of Benefit Accruals

SB475 would suspend benefit accruals if the funded ratio of a plan fell below eighty percent (80%). Taken at face value, SB475 would appear to operate in such a way as to prevent a member from purchasing service credit in the Retirement System at a time when the plan was less than eighty percent (80%) funded, a benefit specifically given to members of the Retirement System pursuant to § 169.440. In addition, it is unclear whether SB475 would allow new members to enter the plan at a time when benefit accruals were suspended. Would the normal contributions made by existing employers also have to cease? Those contributions are tied to payroll and employees earn credited service (a benefit accrual) from employment. What would be the impact of SB475 on survivor and disability benefits? Without in-depth analysis, the number of questions and conflicts this provision creates is unknown.

4. Negative Investment Returns

SB475 would insulate the plans, their governing bodies and employees, from liability if the investment return of the plan falls below zero percent (0%), or if the plan does remain one hundred percent (100%) funded. This provision would specifically exempt a contributing employer from civil liability for "loss or depreciation of funds…" and could be interpreted as

preventing the Trustees from taking actions, otherwise authorized by the statute and their fiduciary duties, to collect contributions from contributing employers.

CONCLUSION

The Retirement System believes that SB475 would be a "substantial proposed change" under § 105.660. The cost associated with undertaking an effort to achieve a one hundred percent (100%) funded ratio by January 1, 2018 is impossible to predict, and the outcome is far from certain. The proposed limitations on benefit increases and benefit accruals directly conflict with existing Missouri law. The changes to the statute may be unconstitutional. The Retirement System does not support SB475.