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# *Public School Retirement System of Missouri*

Actuarial Valuation as of  
June 30, 2015





October 23, 2015

Board of Trustees  
Public School Retirement System of Missouri  
3210 W. Truman Blvd.  
Jefferson City, MO 65109

**Re: Certification of the Actuarial Valuation of the Public School Retirement System of Missouri  
as of June 30, 2015**

Dear Board of Trustees:

An actuarial valuation is performed annually for the Public School Retirement System of Missouri ("PSRS") defined benefit pension plan ("Plan"). The results of the latest actuarial valuation were prepared as of June 30, 2015 and are presented herein pursuant to the engagement letter between PSRS and PricewaterhouseCoopers LLP ("PwC"), dated June 9, 2014, and amended April 16, 2015. This report is intended to provide the Board of Trustees ("Board") with information on the funded status of the Plan, development of the actuarially determined contribution rates, and certain financial statement disclosure information.

**Financing Objectives and Funding Policy**

Under Missouri statutes, contribution rates are adopted annually by the Board. The recommended contribution rate presented herein was actuarially determined based on the funding policy, actuarial assumptions, and actuarial methods adopted by the Board and summarized herein.

In setting contribution rates, the principal objectives of the Board's funding policy are:

- To set contribution rates such that the funded ratio will reach 100% over a closed 30-year period ending June 30, 2040.
- To set contribution rates such that they remain stable over time.
- To set contribution rates such that they promote intergenerational equity.
- To provide a reasonable margin for adverse experience to help offset risks.

**Progress Toward Realization of Financing Objectives**

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a Plan's funded status. It should increase over time until it reaches 100% under the funding policy, though adverse experience could prevent this from being achieved. The funded ratio for the Plan increased by 1.1% from the preceding year to 83.9%, primarily due to the recognition of excess returns from prior years in the AVA development, but partially offset by experience losses on the liability.

**Benefit Provisions**

The benefit provisions reflected in the valuation reports are those which were in effect at June 30, 2015, as set forth in the related Missouri statutes. It is our understanding that there were no changes in benefit provisions that would impact the valuation.

**Assets and Member Data**

The valuation was based on asset values of the trust funds and member census data as of June 30, 2015. All asset information and member data were provided by PSRS. While certain checks for reasonableness were performed, the data was used unaudited. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying asset and census information.

**Actuarial Assumptions and Methods**

The majority of the actuarial assumptions used in the June 30, 2015 valuations were adopted by the Board pursuant to an experience study completed in 2011, which reflected the experience period from June 30, 2005 through June 30, 2010, and were first used in the June 30, 2011 valuation. Additional minor assumption changes were made for the June 30, 2012 valuation. For the June 30, 2013 valuation, the retirement assumption was updated to reflect the permanent extension of the Special Early Retirement ("25-and-out") benefit and the one year extension of the enhanced Normal Retirement ("2.55% formula factor") benefit for members who retire with 31 or more years of service. Also, a new assumption was made to distinguish future service credit for members working in positions covered by Social Security versus those who are not. There were no updates to the actuarial assumptions for the June 30, 2014 or June 30, 2015 valuations. The next experience study is scheduled to be completed prior to the June 30, 2016 valuation.



We believe the actuarial assumptions and methods are reasonable for the purposes of this valuation report and comply with the parameters set forth in Statements No. 67 and No. 68 of the Governmental Accounting Standards Board ("GASB"). Different assumptions and methods may be reasonable for other purposes. As such, the results presented in the valuation reports should only be relied upon for the intended purpose.

#### **Certification**

We certify that the information presented herein is accurate and fairly portrays the actuarial position of the Plan administered by PSRS as of June 30, 2015 based on the underlying census data, asset information and selected assumptions and methods.

This report contains certain accounting information required to be included in the System's Comprehensive Annual Financial Report. This information has been prepared in accordance with our understanding of GASB No.67. This report also contains employer accounting information prepared in accordance with our understanding of GASB No. 68.

To the best of our knowledge this actuarial statement is complete and accurate and has been prepared in accordance with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with our understanding of the requirements of Missouri state law. The undersigned actuaries are members of the Society of Actuaries and other professional organizations, including the American Academy of Actuaries, and meet the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States relating to pension plans. There is no relationship between the PwC practitioners involved in this engagement and PSRS that may impair our objectivity.

The content of this document is limited to the matters specifically addressed herein and does not address any other potential tax consequences, or the potential application of tax penalties, to any matter other than as set forth herein. Our conclusions are not binding upon any taxing authority or the courts and there is no assurance that any relevant taxing authority will not successfully assert a contrary position. In addition, no exceptions (including the reasonable cause exception) are available for any federal or state penalties imposed if any portion of a transaction is determined to lack economic substance or fails to satisfy any similar rule of law, and our advice will not protect you from any such penalties. This document supersedes all prior written or oral advice with respect to the issues addressed in this document and all such prior communications should not be relied upon by any person for any purpose. This document has been prepared pursuant to an engagement letter between PSRS and PwC, and is intended solely for the use and benefits of PSRS and not for reliance by any other person.

Respectfully submitted,

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Ms. Cindy Fraterrigo  
Member, American Academy of Actuaries  
Fellow of the Society of Actuaries  
Enrolled Actuary (No. 14-06229)

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Mr. Brandon Robertson  
Member, American Academy of Actuaries  
Associate of the Society of Actuaries  
Enrolled Actuary (No. 14-07568)

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## SECTION I - EXECUTIVE SUMMARY

### **HIGHLIGHTS OF THE ACTUARY'S REPORT**

This report presents the results of the actuarial valuation of the Public School Retirement System of Missouri ("PSRS") defined benefit pension plan ("Plan") as of June 30, 2015, and has been prepared to present the current funded status of the Plan, contribution requirements for fiscal year 2017 (July 1, 2016 through June 30, 2017), and certain financial statement disclosure information. The valuation was performed using census data for plan members as of June 30, 2015 provided by PSRS and summarized in Section IV of this report, asset information as of June 30, 2015 provided by PSRS, the actuarial assumptions and methods approved by the Board and summarized in Section V, and the plan provisions effective June 30, 2015 summarized in Section VI.

#### **Contributions**

The Board sets, at its discretion and subject to certain restrictions, the applicable employer and member contribution rates upon considering the results of the actuarial valuation and other analysis as appropriate. A total contribution rate of 29.00% (14.50% for employers and 14.50% for members) is recommended for fiscal year 2017, based on the objectives, assumptions, and methods summarized herein. A contribution rate of 29.00% represents no change from the rate currently in effect for fiscal year 2016. The contribution rate approved by the Board becomes effective on July 1, 2016. Therefore, the dollar cost will depend on the actual payroll during fiscal year 2017.

Members of PSRS pay half of the total contribution rate, currently 14.50% of pay. If a member terminates employment with less than 5 years of service, their accumulated contributions with interest can be withdrawn as a lump sum, or the member may direct PSRS to make a direct rollover of the distribution amount. When a member becomes vested with at least 5 years of service, the member also has the option to leave their contributions in the Plan and select from various retirement annuity options at retirement age.

#### **Funded Status**

The funded status of PSRS is measured as the ratio of assets available for benefits to a benefit liability measure for the System. While there are several such measures that could be appropriately used, the benefit liability measure that ties most closely to the funding strategy is the Actuarial Accrued Liability ("AAL").

Using the Actuarial Value of Assets ("AVA"), a smoothed asset value that recognizes 20% of the total investment gain or loss on the AVA for each of the preceding five (5) years, the PSRS AAL funded ratio increased from 82.8% at June 30, 2014 to 83.9% as of June 30, 2015. The increase is primarily due to the recognition of excess returns from prior years in the AVA development, but partially offset by experience losses on the liability.

#### **Investment Experience**

The market value of the assets available for benefits has increased from \$34.4 billion as of June 30, 2014 to \$34.8 billion as of June 30, 2015. The actuarial value of assets increased from \$31.8 billion as of June 30, 2014, to \$34.1 billion as of June 30, 2015. The actuarial value of assets is less than the market value by \$0.7 billion and the difference will be recognized over the next four years.

The assets of the Plan returned 4.3% (net of all expenses) for the year ended June 30, 2015. Based on the Actuarial Value of Assets, the approximate return for the same period was 10.2%. The return on actuarial value is different due to the smoothing of returns greater or less than expected returns over five years. For GASB accounting purposes, the money-weighted return, net of investment expenses only, was 4.3%.

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## SECTION I - EXECUTIVE SUMMARY

### **HIGHLIGHTS OF THE ACTUARY'S REPORT (CONTINUED)**

#### **Funding Policy**

The Board has adopted a formal funding policy with the objective of fully funding the system over a closed 30-year period while adhering to sound financial principles, such as maintaining contribution rate stability and intergenerational equity, and the applicable statutes of the State of Missouri. The policy sets forth certain actions, actuarial assumptions and actuarial methods that are to be utilized in executing the funding strategy. The funding policy is summarized in Section II.

#### **Governmental Accounting Standards**

This report contains certain financial statement information, including notes and required supplemental information, prepared in accordance with our understanding of Governmental Accounting Standards No. 67 and No. 68 ("GASB 67" and "GASB 68"). Information prepared in accordance with GASB 67 is intended to assist PSRS with the preparation of its Comprehensive Annual Financial Report. Information shown in this report prepared in accordance with GASB 68 are the collective amounts for all participating employers in aggregate. Further calculation is required to determine the proportionate share applicable to each participating employer.

#### **Changes in Actuarial Assumptions**

There were no assumption changes for the June 30, 2015 valuation.

However, it is noted that the mortality assumption underlying the results presented in this report was developed during the prior experience study completed in 2011. Since that time, significant new information has become available and new actuarial practices have become prevalent, including the following:

- The Society of Actuaries completed an experience study of mortality for private sector workers, which resulted in the release of several new "RP-2014" mortality tables.
- The Society of Actuaries, the Social Security Administration, and other entities have released mortality improvement scales designed for projecting improvement in the mortality rates of a mortality table on a fully generational basis.
- Computing power and actuarial valuation software improvements have resulted in fully generational mortality projection becoming the norm.

The next experience study is scheduled to be completed in 2016. At that time, the mortality assumption, including the base mortality table and mortality improvement scale, will be reassessed. It is anticipated that new base mortality tables and a fully generational approach to mortality projection will be recommended and if adopted by the Board, will increase the actuarial liabilities and actuarial determined contribution rates computed in future valuations. The actual impact will depend on the assumption ultimately selected, which will be based in part on the recent experience of plan members as well as the information noted above. For illustrative purposes, if the RP-2014 Total Data Set base mortality table with fully generational improvement using the mortality projection inherent in the 2014 Social Security Administration Trustee's Report were adopted, below is the approximate impact (all else equal):

- The Actuarial Accrued Liability would likely increase between 4% and 7%
- The Normal Cost would likely increase between 4% and 7%
- The Actuarially Determined Contribution rate would likely increase between 2% and 4%

The other actuarial assumptions currently used in the annual valuations and summarized herein will also be evaluated and changes to those assumptions may offset or increase the impact of the mortality assumption shown above.

#### **Changes in Plan Provisions**

It is our understanding that there were no changes to the Plan that impacted the pension benefits during the fiscal year.

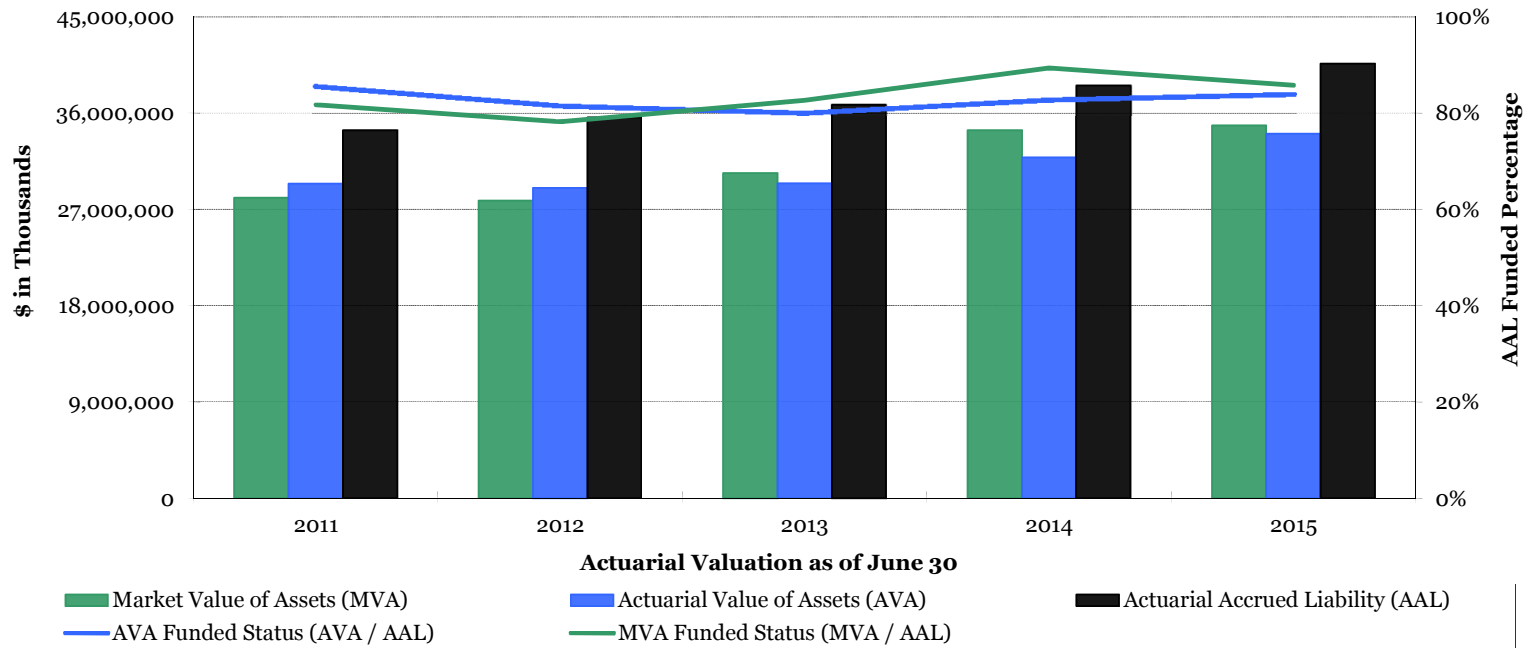
#### **Changes in Actuarial Methods**

There were no changes in the actuarial methods for the June 30, 2015 valuation.

SECTION I - EXECUTIVE SUMMARY

**HISTORICAL SUMMARY**

**PSRS – 5 Year History of Funded Status**



**Actuarial Valuation as of June 30:**

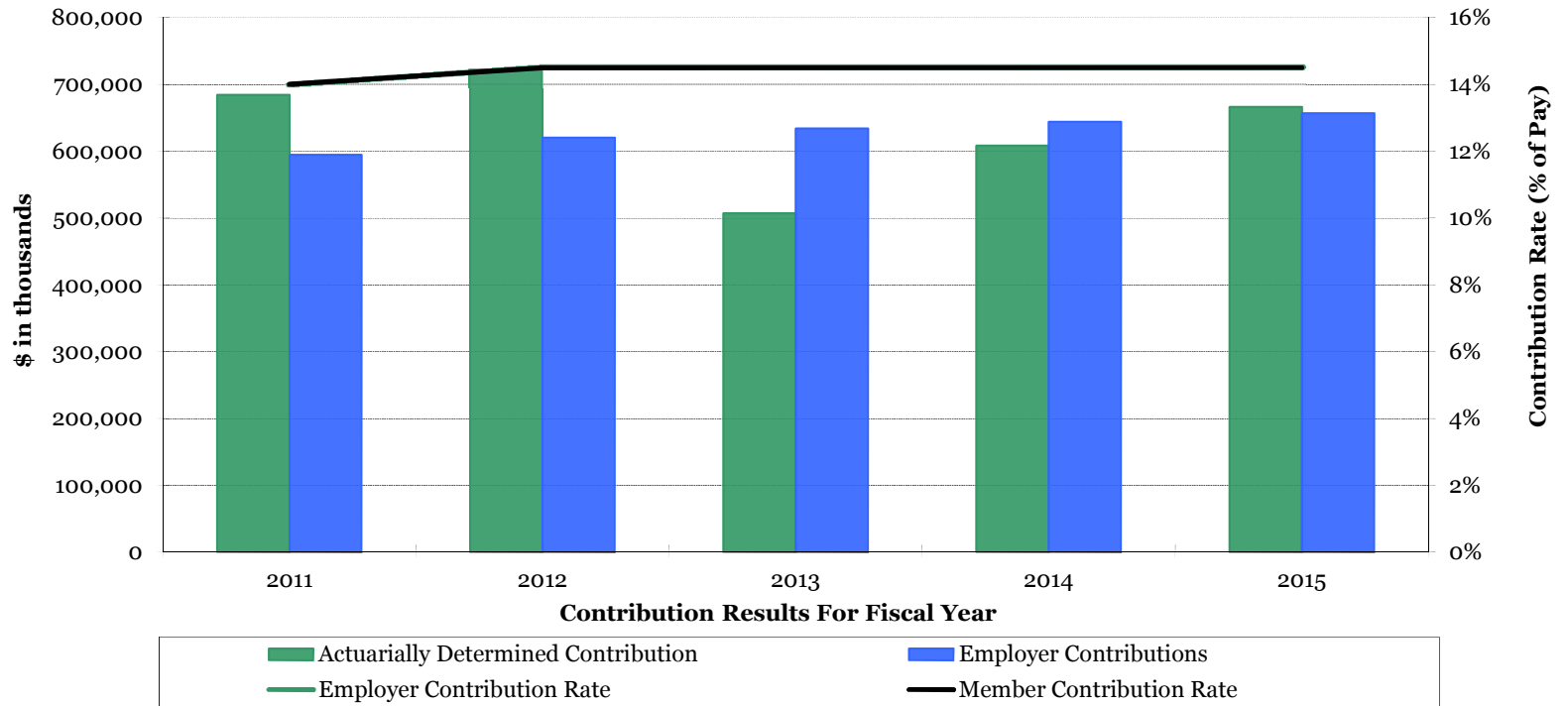
**(\$ in '000's)**

	<b><u>2011</u></b>	<b><u>2012</u></b>	<b><u>2013</u></b>	<b><u>2014</u></b>	<b><u>2015</u></b>
Actuarial Accrued Liability (AAL)	\$34,383,430	\$35,588,030	\$36,758,165	\$38,483,184	\$40,610,540
Actuarial Value of Assets (AVA)	\$29,387,486	\$29,013,002	\$29,443,147	\$31,846,599	\$34,073,415
Market Value of Assets (MVA)	\$28,100,182	\$27,816,773	\$30,375,417	\$34,380,609	\$34,837,680
Unfunded Liability (AAL - AVA)	\$4,995,944	\$6,575,028	\$7,315,018	\$6,636,585	\$6,537,124
AVA Funded Status (AVA / AAL)	85.5%	81.5%	80.1%	82.8%	83.9%
MVA Funded Status (MVA / AAL)	81.7%	78.2%	82.6%	89.3%	85.8%

SECTION I - EXECUTIVE SUMMARY

HISTORICAL SUMMARY (CONTINUED)

PSRS – 5 Year History of Contributions



**Contribution Results For Fiscal Year:**

**(\$ in '000's)**

	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Actuarially Determined Contribution	\$684,366.8	\$720,304.0	\$507,232.3	\$608,459.4	\$666,439.0
Employer Contributions	\$594,732.1	\$620,214.2	\$634,040.3	\$643,989.9	\$656,924.9
ADC % Contributed	86.9%	86.1%	125.0%	105.8%	98.6%
Employer Contribution Rate	14.00%	14.50%	14.50%	14.50%	14.50%
Member Contribution Rate	14.00%	14.50%	14.50%	14.50%	14.50%



SECTION I - EXECUTIVE SUMMARY

**HISTORICAL SUMMARY (CONTINUED)**

Summary of Valuation Results <sup>1</sup>

<u>Valuation Date</u>	<u>June 30, 2011</u>	<u>June 30, 2012</u>	<u>June 30, 2013</u>	<u>June 30, 2014</u>	<u>June 30, 2015</u>
Development of Actuarially Determined Contribution Rate:					
1. Anticipated Payroll	\$ 4,338,975,912	\$ 4,379,059,546	\$ 4,460,871,713	\$ 4,425,567,630	\$ 4,508,241,581
2. Total Normal Cost (Mid-Year):					
a. Amount	\$ 831,201,088	\$ 833,145,686	\$ 849,712,130	\$ 836,085,151	\$ 842,548,463
b. Percentage of Payroll	19.16%	19.03%	19.05%	18.89%	18.69%
3. Total Unfunded Actuarial Accrued Liability Annual Amortizations (Mid-Year):					
a. Amount	\$ 301,283,759	\$ 401,379,307	\$ 453,336,439	\$ 421,555,305	\$ 424,734,170
b. Percentage of Payroll	6.94%	9.17%	10.16%	9.53%	9.42%
4. Total Actuarially Determined Contribution Rate:					
a. Percentage of Payroll: (2)(b) + (3)(b)	<b>26.10%</b>	<b>28.20%</b>	<b>29.21%</b>	<b>28.42%</b>	<b>28.11%</b>
b. Effective UAAL Amortization Period		29.0 Years	28.2 Years	26.9 Years	25.8 Years
5. Recommended Total Contribution Rate, Member + Employer:					
a. Percentage of Payroll	<b>29.00%</b>	<b>29.00%</b>	<b>29.00%</b>	<b>29.00%</b>	<b>29.00%</b>
b. Effective UAAL Amortization Period		24.8 Years	29.4 Years	24.2 Years	22.1 Years
c. Effective Date	July 1, 2012	July 1, 2013	July 1, 2014	July 1, 2015	July 1, 2016

<sup>1</sup> The contribution rates shown were developed on a funding basis only and do not reflect accounting requirements.

SECTION I - EXECUTIVE SUMMARY

**HISTORICAL SUMMARY (CONTINUED)**

**Summary of Valuation Results (Continued)**

	<u>June 30, 2011</u>	<u>June 30, 2012</u>	<u>June 30, 2013</u>	<u>June 30, 2014</u>	<u>June 30, 2015</u>
Census Information					
Active					
Number <sup>1</sup>	77,708	77,529	78,076	75,168	78,314
Average Age	42.3	42.2	42.1	42.2	42.0
Average Years of Service	11.5	11.4	11.4	11.8	11.5
Anticipated Payroll of Actives (\$ in 000's) <sup>2</sup>	\$ 4,338,976	\$ 4,379,060	\$ 4,460,872	\$ 4,425,568	4,508,242
Inactive					
Vested					
Number <sup>3</sup>	6,645	6,891	7,203	8,884	7,656
Annual Deferred Annuities (\$ in 000's)	\$ 62,913	\$ 66,943	\$ 71,974	\$ 96,084	\$ 80,645
Non Vested					
Number	4,935	4,633	4,446	5,567	4,423
Account Balance (\$ in 000's)	\$ 51,805	\$ 50,988	\$ 50,686	\$ 64,244	\$ 46,394
Former Members					
Entitled to a Deferred Annuity					
Number			50	67	119
Annual Deferred Annuities (\$ in 000's)			\$ 905	\$ 568	\$ 1,599
Entitled to a Refund of Contributions					
Number	2,811	3,069	3,286	3,733	4,065
Account Balance (\$ in 000's)	\$ 18,267	\$ 22,335	\$ 23,205	\$ 31,549	\$ 34,683
Retiree/Beneficiary/Disabled					
Number	48,065	50,344	52,306	54,486	56,125
Annual Benefits Payable (\$ in 000's) <sup>4</sup>	\$ 1,771,699	\$ 1,893,836	\$ 2,008,069	\$ 2,134,558	\$ 2,263,957

<sup>1</sup> The number of active members as of June 30, 2015 includes 2,132 members who retired in July 2015.

<sup>2</sup> Figures shown are the anticipated pay for the one-year period following the valuation date. For the June 30, 2015 valuation, anticipated payroll excludes 2,132 members who retired in July 2015.

<sup>3</sup> The number of inactive vested members as of June 30, 2015 includes 28 members who retired in July 2015.

<sup>4</sup> Excludes \$5,000 death benefits and tax sheltered annuities; The annual benefits payable as of June 30, 2015 does not include 2,160 members who retired in July 2015.

SECTION I - EXECUTIVE SUMMARY

**HISTORICAL SUMMARY (CONTINUED)**

**Summary of Valuation Results (Continued)**

	<u>June 30, 2011</u>	<u>June 30, 2012</u>	<u>June 30, 2013</u>	<u>June 30, 2014</u>	<u>June 30, 2015</u>
<b>Present Value of Future Benefits</b>					
Member Contribution Balances	\$ 6,571,916,082	\$ 6,687,357,639	\$ 6,856,920,007	\$ 6,985,665,067	\$ 6,787,037,824
Retiree/Beneficiary	19,846,512,441	21,001,513,187	22,124,006,508	23,367,687,349	24,362,454,505
Disabled	177,188,558	189,519,113	204,788,381	212,310,218	311,715,660
Inactive	8,088,781	62,541,687	74,467,654	101,926,552	93,048,140
Active	<u>15,587,962,363</u>	<u>15,519,264,944</u>	<u>15,447,188,509</u>	<u>15,611,874,950</u>	<u>17,217,411,367</u>
Total	\$ <u>42,191,668,226</u>	\$ <u>43,460,196,569</u>	\$ <u>44,707,371,059</u>	\$ <u>46,279,464,136</u>	\$ <u>48,771,667,496</u>
<b>Actuarial Accrued Liability (AAL)</b>					
Member Contribution Balances	\$ 6,571,916,082	\$ 6,687,357,639	\$ 6,856,920,007	\$ 6,985,665,067	\$ 6,787,037,824
Retiree/Beneficiary	19,846,512,441	21,001,513,187	22,124,006,508	23,367,687,349	24,362,454,505
Disabled	177,188,558	189,519,113	204,788,381	212,310,218	311,715,660
Inactive	8,088,781	62,541,687	74,467,654	101,926,552	93,048,140
Active	<u>7,779,724,712</u>	<u>7,647,099,014</u>	<u>7,497,982,861</u>	<u>7,815,594,746</u>	<u>9,056,283,487</u>
Total	\$ <u>34,383,430,575</u>	\$ <u>35,588,030,639</u>	\$ <u>36,758,165,411</u>	\$ <u>38,483,183,932</u>	\$ <u>40,610,539,616</u>
<b>Actuarial Value of Assets (AVA)</b>					
Member Contribution Balances	\$ 6,571,916,082	\$ 6,687,357,639	\$ 6,856,920,007	\$ 6,985,665,067	\$ 6,787,037,824
Retiree/Beneficiary	19,846,512,441	21,001,513,187	22,124,006,508	23,367,687,349	24,362,454,505
Disabled	177,188,558	189,519,113	204,788,381	212,310,218	311,715,660
Inactive	8,088,781	62,541,687	74,467,654	101,926,552	93,048,140
Active	<u>2,783,780,566</u>	<u>1,072,070,617</u>	<u>182,964,322</u>	<u>1,179,010,201</u>	<u>2,519,159,101</u>
Total	\$ <u>29,387,486,429</u>	\$ <u>29,013,002,242</u>	\$ <u>29,443,146,872</u>	\$ <u>31,846,599,387</u>	\$ <u>34,073,415,230</u>
<b>Unfunded Actuarial Accrued Liability: AAL - AVA</b>					
Member Contribution Balances	\$ -	\$ -	\$ -	\$ -	\$ -
Retiree/Beneficiary	-	-	-	-	-
Disabled	-	-	-	-	-
Inactive	-	-	-	-	-
Active	<u>4,995,944,146</u>	<u>6,575,028,397</u>	<u>7,315,018,539</u>	<u>6,636,584,545</u>	<u>6,537,124,386</u>
Total	\$ <u>4,995,944,146</u>	\$ <u>6,575,028,397</u>	\$ <u>7,315,018,539</u>	\$ <u>6,636,584,545</u>	\$ <u>6,537,124,386</u>
<b>Funded Percentage: AVA / AAL <sup>1</sup></b>					
Member Contribution Balances	100.0%	100.0%	100.0%	100.0%	100.0%
Retiree/Beneficiary	100.0%	100.0%	100.0%	100.0%	100.0%
Disabled	100.0%	100.0%	100.0%	100.0%	100.0%
Inactive	100.0%	100.0%	100.0%	100.0%	100.0%
Active	<u>35.8%</u>	<u>14.0%</u>	<u>2.4%</u>	<u>15.1%</u>	<u>27.8%</u>
Total	85.5%	81.5%	80.1%	82.8%	83.9%
<b>Market Value of Assets</b>	\$ 28,100,181,499	\$ 27,816,772,561	\$ 30,375,416,792	\$ 34,380,608,561	\$ 34,837,679,504
<b>Summary of Assumptions</b>					
Valuation Interest Rate	8.0%	8.0%	8.0%	8.0%	8.0%
Salary Increases	4.0% - 10.0%	4.0% - 10.0%	4.0% - 10.0%	4.0% - 10.0%	4.0% - 10.0%
Cost-of-Living Assumption	2.0%	2.0%	2.0%	2.0%	2.0%

<sup>1</sup> In determining the funded percentage, the assets are allocated first to member contribution balances, then to the retiree/beneficiary/disabled liability, then to the inactive liability, and then to the active liability.

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## SECTION II - FUNDING

### **FUNDING**

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## SECTION II - FUNDING

### A. Summary of Funding Policy

#### Introduction

The Board of Trustees ("Board") for the Public School Retirement System of Missouri (PSRS) has adopted a funding policy to record the funding objectives and help ensure the systematic funding of future benefit payments for members of PSRS. The funding policy governs the methods used in performing the actuarial valuation, which is the basis for determining the annual contribution rate for both employers and members. The funding policy shall be updated every five years in conjunction with an experience study. Other changes to the funding policy may be considered between the five-year periods as recommended by the actuary.

The "Funding" results presented in this section of the report were prepared in accordance with the funding policy.

#### Funding Objective

The funding objective is to achieve a funded ratio of 100% over a closed 30-year period from fiscal year 2011 through fiscal year 2040. For this purpose, the funded ratio is defined as the Actuarial Value of Assets divided by the Actuarial Accrued Liability determined under the Entry Age Normal Cost Method with Normal Costs calculated as a percentage of payroll using the actuarial assumptions adopted by the Board.

#### Principles of Funding

1. Maintain adequate assets so that current plan assets plus future contributions and investment earnings should be sufficient to fund all benefits expected to be paid to members and their beneficiaries.
2. Maintain stability of contribution rates, consistent with other funding objectives.
3. Maintain public policy goals of accountability and transparency. Each policy element is clear in intent and effect, and each should allow an assessment of whether, how and when the funding requirements of the plan will be met.
4. Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring those costs to future members and employers.
5. Provide a reasonable margin for adverse experience to help offset risks.
6. Review the investment earning assumption in conjunction with the periodic asset liability study and in consideration of the Board's risk profile.
7. Review demographic and economic assumptions in conjunction with an experience study performed by an actuary.
8. Continue progress of systematic reduction of the Unfunded Actuarial Accrued Liabilities (UAAL) while keeping the member and employer contribution rates at or near those paid during 2010-2011.

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## SECTION II - FUNDING

### **A. Summary of Funding Policy (Continued)**

#### **Annual Actuarial Valuation to Set Contribution Rates**

In accordance with statute, annual actuarial valuations of the System's assets and liabilities shall be performed by an actuary. The contribution rate shall be established based on the results of these valuations. The funding policy requires that the Actuarially Determined Contribution Rate ("ADC") is equal to the sum of the employer normal cost and an amortization of the unfunded actuarial accrued liability (UAAL). The contribution rates shall be approved by the Board no later than December 31st for the upcoming school year.

The Board, at its discretion (to the extent permitted by law), may authorize a change in the member and employer contribution rates from one year to the next should the actuary determine that the target date of full funding by 2040 will not be met. The decision by the Board will be based on the number of years of the divergence from the target date and the likelihood that this divergence is permanent. The contribution rate cannot be increased by more than 1.0% (0.5% for employers and 0.5% for members) per year.

SECTION II - FUNDING

**B. Development of Funded Status**

	<b>June 30, 2014</b>	<b>June 30, 2015</b>
1. Present Value of Future Benefits		
a. Member Contribution Balances	\$ 6,985,665,067	\$ 6,787,037,824
b. Retirees, Beneficiaries, and Disableds	23,579,997,567	24,674,170,165
c. Inactives	101,926,552	93,048,140
d. Actives	15,611,874,950	17,217,411,367
e. Total: (1)(a) + (1)(b) + (1)(c) + (1)(d)	\$ 46,279,464,136	\$ 48,771,667,496
2. Actuarial Accrued Liability		
a. Member Contribution Balances	\$ 6,985,665,067	\$ 6,787,037,824
b. Retirees, Beneficiaries, and Disableds	23,579,997,567	24,674,170,165
c. Inactives	101,926,552	93,048,140
d. Actives	7,815,594,746	9,056,283,487
e. Total: (2)(a) + (2)(b) + (2)(c) + (2)(d)	\$ 38,483,183,932	\$ 40,610,539,616
3. Actuarial Value of Assets <sup>1</sup>		
a. Member Contribution Balances	\$ 6,985,665,067	\$ 6,787,037,824
b. Retirees, Beneficiaries, and Disableds	23,579,997,567	24,674,170,165
c. Inactives	101,926,552	93,048,140
d. Actives	1,179,010,201	2,519,159,101
e. Total: (3)(a) + (3)(b) + (3)(c) + (3)(d)	\$ 31,846,599,387	\$ 34,073,415,230
4. Unfunded Actuarial Accrued Liability <sup>1</sup>		
a. Member Contribution Balances: (2)(a) - (3)(a)	\$ -	\$ -
b. Retirees, Beneficiaries, and Disableds: (2)(b) - (3)(b)	-	-
c. Inactives: (2)(c) - (3)(c)	-	-
d. Actives: (2)(d) - (3)(d)	6,636,584,545	6,537,124,386
e. Total: (2)(e) - (3)(e)	6,636,584,545	6,537,124,386
5. Funded Percentage <sup>1</sup>		
a. Member Contribution Balances: (3)(a)/(2)(a)	100.0%	100.0%
b. Retirees, Beneficiaries, and Disableds: (3)(b)/(2)(b)	100.0%	100.0%
c. Inactives: (3)(c)/(2)(c)	100.0%	100.0%
d. Actives: (3)(d)/(2)(d)	15.1%	27.8%
e. Total: (3)(e)/(2)(e)	82.8%	83.9%

<sup>1</sup> In determining the funded percentage, the assets are allocated first to member contribution balances, then to the retiree/beneficiary/disabled liability, then to the inactive liability, and then to the active liability.

SECTION II - FUNDING

**C. Reconciliation of Unfunded Actuarial Accrued Liability**

	<u>June 30, 2015</u>
1. Unfunded Actuarial Accrued Liability, Prior Year	\$ 6,636,584,545
2. Changes in Unfunded Actuarial Accrued Liability	
a. Impact of Plan Changes	\$ -
b. Actuarial (Gains) / Losses	
i. Actuarial Value of Assets Experience	\$ (698,375,937)
ii. Actuarial Accrued Liability Experience Other Than Salary Experience <sup>1</sup>	877,932,447
iii. Additional Liability Due to Salary Experience	(279,515,391)
iv. Additional Liability Due to Cost-of-Living Adjustments	-
v. Additional Liability Due to Assumption Changes	-
vi. Total Unfunded Actuarial Accrued Liability (Gain)/Loss	<u>\$ (99,958,881)</u>
c. (Excess) / Shortfall of Contributions <sup>2</sup>	<u>(92,659,070)</u>
d. Total New Amortization Bases: (2)(a) + (2)(b)(vi) + (2)(c)	\$ (192,617,951)
e. Net Change in Existing Bases Due to Prior Year Contributions, Net of Interest	<u>93,157,792</u>
f. Total Changes in Unfunded Actuarial Accrued Liability: (2)(d) + (2)(e)	\$ (99,460,159)
3. Unfunded Actuarial Accrued Liability, Current Year: (1) + (2)(f)	\$ 6,537,124,386

<sup>1</sup> Includes refinements in valuation procedures concerning COLA timing, benefits payable to beneficiaries and dependents of disabled retirees, and members who retired in July 2015.

<sup>2</sup> Includes the net effect of total contributions in excess of the Actuarially Determined Contribution Rate and member contributions for service purchases being less than the resulting increase in liability.



SECTION II - FUNDING

**D. Reconciliation of Actuarial Accrued Liability**

1. June 30, 2014 Actuarial Accrued Liability	\$	38,483,183,932	
2. Normal Cost for 2014 Plan (Mid-Year)		836,085,151	
3. Benefit Payments <sup>1</sup>		2,326,196,773	
4. Interest of 8% on (1) + (2)/2 - (3)/2		3,019,050,250	
5. Expected June 30, 2015 Actuarial Accrued Liability: (1) + (2) - (3) + (4)	\$	40,012,122,560	
		Dollar Change in Liability	Percent Change in Liability
6. (Gain)/Loss Components			
a. Census and Experience Other Than Salary Experience <sup>2</sup>	\$	877,932,447	2.2%
b. Salary Experience		(279,515,391)	(0.7%)
c. Cost-of-Living Adjustment		-	0.0%
d. Assumption Changes		-	0.0%
e. Legislative Changes		-	0.0%
f. Total: (6)(a) + (6)(b) + (6)(c) + (6)(d) + (6)(e)	\$	598,417,056	1.5%
7. Actual June 30, 2015 Actuarial Accrued Liability: (5) + (6)(f)	\$	<b>40,610,539,616</b>	

<sup>1</sup> Includes refunds of accumulated member contributions.

<sup>2</sup> Includes refinements in valuation procedures concerning COLA timing, benefits payable to beneficiaries and dependents of disabled retirees, and members who retired in July 2015.

SECTION II - FUNDING

**E. Reconciliation of Market Value of Assets**

	<b>June 30, 2014</b>	<b>June 30, 2015</b>
1. Market Value of Assets, Prior June 30	\$ 30,375,416,792	\$ 34,380,608,561
2. Operating Revenues (Receipts)		
a. Employer Contributions	\$ 643,989,869	\$ 656,924,899
b. Member Contributions <sup>1</sup>	679,390,918	689,187,215
c. Interest	163,970,579	177,311,665
d. Dividends	152,739,472	165,308,030
e. Net Income from Security Lending Activities	3,375,138	3,560,672
f. Net Capital Appreciation/(Depreciation)	4,677,159,668	1,504,338,229
g. Investment Expenses	(70,052,440)	(403,375,033)
h. Other Income	6,171	25,640
i. Total Receipts:	\$ 6,250,579,375	\$ 2,793,281,317
(2)(a) + (2)(b) + (2)(c) + (2)(d) + (2)(e) + (2)(f)+(2)(g)+(2)(h)		
3. Operating Expenses (Disbursements)		
a. Benefit Payments	\$ 2,180,546,938	\$ 2,270,258,828
b. Refunds to Members	55,921,469	55,937,945
c. Administrative Expenses	8,902,611	10,011,961
d. Other Expenses	16,588	1,640
e. Total Disbursements:	\$ 2,245,387,606	\$ 2,336,210,374
(3)(a) + (3)(b) + (3)(c) + (3)(d)		
4. Excess of Revenues over Expenses: (2)(i) - (3)(e)	\$ 4,005,191,769	\$ 457,070,943
5. Market Value of Assets, Current June 30: (1) + (4)	<b>\$ 34,380,608,561</b>	<b>\$ 34,837,679,504</b>

<sup>1</sup> Includes member contributions for service purchases and reinstatements.

SECTION II - FUNDING

**F. Development of Actuarial Value of Assets**

1.	Actuarial Value of Assets June 30, 2014		\$ 31,846,599,387
2.	Activity for Fiscal Year 2015		
	a. Contributions		\$ 1,346,112,114
	b. Benefit Payments		<u>(2,326,196,773)</u>
	c. Net Cash Flow		\$ (980,084,659)
3.	Expected Returns <sup>1</sup>		\$ 2,508,524,565
4.	Assets Before Allocation of Gain/Loss: (1) + (2) + (3)		\$ 33,375,039,293
5.	Actual Returns for 2015 (Net of Expenses)		\$ 1,437,155,602
6.	Excess Returns for 2015: (5) - (3)		\$ (1,071,368,963)
7.	Recognized Excess Returns:		
	<u>Year</u>	<u>Excess Return</u>	<u>% Unrecognized</u>
	2015	(1,071,368,963)	80%
	2014	2,599,351,144	60%
	2013	1,090,287,168	40%
	2012	(1,871,830,546)	20%
	2011	2,745,440,880	0%
	Total		<u>\$ 549,088,176</u>
8.	Actuarial Value of Assets, June 30, 2015: (4) + (7)		<b>\$ 34,073,415,230</b>

<sup>1</sup> Assumes cash flows occur at mid-year.

SECTION II - FUNDING

G. Contribution Rate

<b>Development of Actuarially Determined Contribution Rate:</b>	<u>June 30, 2014</u>	<u>June 30, 2015</u>
1. Anticipated Payroll	\$ 4,425,567,630	\$ 4,508,241,581
2. Normal Cost (Mid-Year)		
a. Amount	\$ 836,085,151	\$ 842,548,463
b. Percentage of Payroll	18.89%	18.69%
3. Unfunded Actuarial Accrued Liability (UAAL) Annual Amortizations (Mid-Year)		
a. Amount	\$ 421,555,305	\$ 424,734,170
b. Percentage of Payroll	9.53%	9.42%
4. Actuarially Determined Contribution Rate		
a. Percentage of Payroll: (2)(b) + (3)(b)	<b>28.42%</b>	<b>28.11%</b>
b. Effective UAAL Amortization Period	26.9 Years	25.8 Years
5. Recommended Total Contribution Rate, Member + Employer		
a. Percentage of Payroll	<b>29.00%</b>	<b>29.00%</b>
b. Effective UAAL Amortization Period	24.2 Years	22.1 Years
c. Effective Date	July 1, 2015	July 1, 2016

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SECTION II - FUNDING

**H. Determination of the Normal Cost Rate**

	<u>Dollar (mid-year) <sup>1</sup></u>	<u>Rate</u>
1. Active Members		
a. Retirement Benefits	\$ 738,714,110	16.39%
b. Termination Benefits	82,079,196	1.82%
c. Death Benefits	11,001,200	0.24%
d. Disability Benefits	<u>10,753,957</u>	<u>0.24%</u>
e. Total Normal Cost	\$ 842,548,463	18.69%
2. Anticipated Member Payroll	\$ 4,508,241,581	

<sup>1</sup> Normal cost amounts include a 2.00% load for anticipated losses on service purchases.

SECTION II - FUNDING

**I. Determination of the Unfunded Actuarial Accrued Liability Amortization Rate**

	Date Base Established	Reason	Remaining Balance <sup>1</sup>	Remaining Period	Amortization Amount (Mid-Year)	Rate
1.	6/30/2007	Plan Amendment	\$ 31,239,788	12	\$ 3,384,870	0.08%
2.	6/30/2011	UAAL Fresh Start	5,285,578,072	26	342,209,774	7.59%
3.	6/30/2012	Experience Loss	1,567,226,226	27	99,421,766	2.20%
4.	6/30/2013	Experience Loss	716,663,799	28	44,601,537	0.99%
5.	6/30/2013	Plan Amendment <sup>2</sup>	(64,154,006)	28	(3,992,621)	-0.09%
6.	6/30/2014	Experience Gain	(806,811,542)	29	(49,315,585)	-1.09%
7.	6/30/2015	Experience Gain	(192,617,951)	30	(11,575,571)	-0.26%
	Total		<u>\$ 6,537,124,386</u>		<u>\$ 424,734,170</u>	<u>9.42%</u>
7.	Anticipated Member Payroll				\$ 4,508,241,581	

<sup>1</sup> Amortized as a level percent of payroll using the 3.50% payroll growth assumption and an 8% discount rate.

<sup>2</sup> Includes the permanent extension of the Special Early Retirement ("25-and-out") benefit and one year extension of the enhanced Normal Retirement ("2.55% formula factor") benefit for members who retire with 31 or more years of service, which reduced the Actuarial Accrued Liability and is therefore being amortized over 30 years.

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SECTION II - FUNDING

**J. History of Contribution Rates**<sup>1</sup>

<u>Valuation Date</u>	<u>Effective Date</u>	<u>Total Contribution Rate</u>
June 30, 2001	July 1, 2002	21.00%
June 30, 2002	July 1, 2003	21.00%
June 30, 2003	July 1, 2004	22.00%
June 30, 2004	July 1, 2005	23.00%
June 30, 2005	July 1, 2006	24.00%
June 30, 2006	July 1, 2007	25.00%
June 30, 2007	July 1, 2008	26.00%
June 30, 2008	July 1, 2009	27.00%
June 30, 2009	July 1, 2010	28.00%
June 30, 2010	July 1, 2011	29.00%
June 30, 2011	July 1, 2012	29.00%
June 30, 2012	July 1, 2013	29.00%
June 30, 2013	July 1, 2014	29.00%
June 30, 2014	July 1, 2015	29.00%

<sup>1</sup> Valuation results prior to June 30, 2009 were calculated by the prior actuary.

SECTION II - FUNDING

**K. Historical Investment Experience**

<u>Year Ending June 30</u>	<u>Rate of Investment Return</u>		<u>Actuarial Assumed</u>
	<u>Market Basis <sup>1</sup></u>	<u>Actuarial Basis <sup>2,3</sup></u>	<u>Interest Rate</u>
2006	9.6%	9.3%	8.00%
2007	16.4%	11.0%	8.00%
2008	(4.4%)	8.1%	8.00%
2009	(19.5%)	2.1%	8.00%
2010	12.8%	2.3%	8.00%
2011	21.6%	4.0%	8.00%
2012	1.7%	1.2%	8.00%
2013	12.4%	4.4%	8.00%
2014	16.7%	11.0%	8.00%
2015	4.3%	10.2%	8.00%

<sup>1</sup> As provided by PSRS. Net of all expenses and fees.

<sup>2</sup> Approximate return net of all expenses and fees and assuming all cash flows occurred at mid-year.

<sup>3</sup> Valuation results prior to June 30, 2009 were calculated by the prior actuary.



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SECTION III - ACCOUNTING

**ACCOUNTING**

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SECTION III - ACCOUNTING

**PLAN FINANCIAL STATEMENTS UNDER GASB #67**

**A. Statement of Fiduciary Net Position under GASB #67 as of June 30, 2015**

1. Assets		
a. Cash	\$	94,627,025
b. Receivables		
i. Contributions Receivable	\$	205,995,396
ii. Accrued Interest and Dividends		62,831,778
iii. Investment Sales		1,425,644,974
iv. Due from PEERS		103,806
v. Other		15,761
vi. Total Receivables	\$	1,694,591,715
c. Total Investments		
i. Short-Term Investments	\$	661,972,413
ii. US Treasuries and TIPS		6,060,862,509
iii. US Public Equities		10,661,524,996
iv. Global Public Equities		5,326,855,987
v. Public Debt		2,191,690,487
vi. Private Equity		2,589,918,813
vii. Private Credit		265,880,301
viii. Private Real Estate		2,494,626,713
ix. Hedged Assets		4,699,137,925
x. Total Investments	\$	34,952,470,144
d. Invested Securities Lending Collateral		373,059,810
e. Prepaid Expenses		85,515
f. Fixed Assets, Net of Depreciation		26,014,091
g. Total Assets: (1)(a) + (1)(b)(vi) + (1)(c)(x) + (1)(d) + (1)(e) + (1)(f)	\$	37,140,848,300
2. Liabilities		
a. Accounts Payable	\$	15,921,395
b. Interest Payable		108,438
c. Securities Lending Collateral		373,056,712
d. Investment Purchases		1,911,620,392
e. Due to PEERS		-
f. Lease Liability		-
g. Accrued Medical Claims <sup>1</sup>		75,000
h. OPEB Liability for System Employees <sup>1</sup>		1,051,271
i. Compensated Absences <sup>1</sup>		1,335,588
j. Total Liabilities: (2)(a) + (2)(b) + (2)(c) + (2)(d) + (2)(e) + (2)(f) + (2)(g) + (2)(h) + (2)(i)	\$	2,303,168,796
3. Fiduciary Net Position Restricted for Pensions: (1)(g) - (2)(j)	\$	<b>34,837,679,504</b>

<sup>1</sup> Compensation and benefit costs related to System employees and paid from the Trust.

SECTION III - ACCOUNTING

**PLAN FINANCIAL STATEMENTS UNDER GASB #67**

**B. Statement of Changes in Fiduciary Net Position under GASB #67 for the Year Ended June 30, 2015**

1.	Fiduciary Net Position as of June 30, 2014	\$	34,380,608,561
2.	Additions		
a.	Contributions		
	i. Member Contributions		689,187,215
	ii. Employer Contributions		656,924,899 <sup>1</sup>
	iii. Non-Employer Contributing Entity Contributions		-
	iv. Total Contributions	\$	1,346,112,114
b.	Investment Income/(Loss)		
	i. Net Appreciation/(Depreciation)	\$	1,504,338,229
	ii. Net Interest and Dividend Income		342,619,695
	iii. Net Income from Security Lending Activities		3,560,672
	iv. Other Net Investment Income		-
	v. Investment Expenses and Rebates		(403,375,033)
	vi. Total Investment Income/(Loss)	\$	1,447,143,563
c.	Other Additions		
	i. PSRS Capital Asset Change	\$	-
	ii. Miscellaneous Income		25,640
	iii. Total Other Additions	\$	25,640
d.	Total Revenue (Additions): (2)(a)(iv) + (2)(b)(vii) + (2)(c)(iii)	\$	2,793,281,317
3.	Deductions		
a.	Monthly Benefits	\$	2,270,258,828
b.	Refunds of Contributions		55,937,945
c.	Administrative Expenses		10,011,961 <sup>1</sup>
d.	Other Expenses		1,640
e.	Total Expenses (Deductions): (3)(a) + (3)(b) + (3)(c) + (3)(d)	\$	2,336,210,374
4.	Net Increase (Decrease) in Fiduciary Net Position: (2)(d) - (3)(e)	\$	457,070,943
5.	Fiduciary Net Position as of June 30, 2015: (1) + (4)	\$	<b>34,837,679,504</b>

<sup>1</sup> Includes \$24,712 of contributions for system employees.

SECTION III - ACCOUNTING

**EMPLOYER FINANCIAL STATEMENTS UNDER GASB #68**

**C. Net Pension Liability under GASB #68 for the Year Ended June 30, 2015**

1.	Total Pension Liability		
	a. Total Pension Liability - Beginning of year	\$	38,483,183,932
	b. Total service cost <sup>1</sup>		836,085,151
	c. Interest cost <sup>2</sup>		3,019,050,250
	d. Experience (gains)/losses		598,417,056
	e. Assumption changes		-
	f. Plan amendments		-
	g. Benefit payments <sup>3</sup>		(2,326,196,773)
	h. Total Pension Liability - End of year	\$	<u>40,610,539,616</u>
2.	Plan Fiduciary Net Position		
	a. Plan Fiduciary Net Position - Beginning of year	\$	34,380,608,561
	b. Employer contributions <sup>4</sup>		656,924,899
	c. Member contributions		689,187,215
	d. Non-employer contributing entity contributions		-
	e. Investment return		
	i. Expected investment return <sup>5</sup>	\$	2,711,245,299
	ii. Investment gain/(loss)		<u>(1,264,076,096)</u>
	iii. Net investment return		1,447,169,203
	f. Benefit payments <sup>3</sup>		(2,326,196,773)
	g. Administrative and Other Expenses <sup>4</sup>		<u>(10,013,601)</u>
	h. Plan Fiduciary Net Position - End of year:	\$	<u>34,837,679,504</u>
3.	Net Pension Liability		
	a. Net Pension Liability: (1)(h) - (2)(h)	\$	<b>5,772,860,112</b>
	b. Plan Fiduciary Net Position as a Percentage of the Total Pension Liability : (2)(h) / (1)(h)		85.8%

<sup>1</sup> Mid-year

<sup>2</sup> Includes interest of 4.00% on the mid-year service cost and reflects actual benefit payments.

<sup>3</sup> Includes refunds of accumulated member contributions.

<sup>4</sup> Includes \$24,712 of contributions for system employees.

<sup>5</sup> 8.00%, net of investment expenses and assuming cash flows occur at mid-year.

SECTION III - ACCOUNTING

**EMPLOYER FINANCIAL STATEMENTS UNDER GASB #68**

**D. Deferred Inflows and Outflows of Resources under GASB #68 for the Year Ended June 30, 2015 <sup>1</sup>**

Fiscal Year Established	Reason	Remaining Balance At Beginning of Year	Remaining Period <sup>2</sup>	Annual Recognition	Remaining Balance At End of Year
1. Liability experience					
a. Inflows					
None					
b. Outflows					
2014	Experience loss	\$ (191,131,438)	5.39	\$ (35,460,378)	\$ (155,671,060)
2015	Experience loss	\$ (598,417,056)	6.54	\$ (91,501,079)	\$ (506,915,977)
2. Assumption changes					
a. Inflows					
None					
b. Outflows					
None					
3. Investment experience <sup>3</sup>					
a. Inflows					
2014	Investment gain	\$ 1,973,046,686	4.00	\$ 493,261,672	\$ 1,479,785,014
b. Outflows					
2015	Investment loss	\$ (1,264,076,096)	5.00	\$ (252,815,220)	\$ (1,011,260,876)
4. Total deferred inflows / outflows: (1) + (2) + (3)					
a. Inflows					
	Total	<b>\$ 1,973,046,686</b>		<b>\$ 493,261,672</b>	<b>\$ 1,479,785,014</b>
b. Outflows					
	Total	<b>\$ (2,053,624,590)</b>		<b>\$ (379,776,677)</b>	<b>\$ (1,673,847,913)</b>

<sup>1</sup> The effort and cost to re-create financial statement information for 10 years was not practical. Information was prepared prospectively from June 30, 2013 for GASB #68 purposes.

<sup>2</sup> The initial amortization period for liability experience gains / losses and assumption change gains / losses is equal to the expected future working lifetime of all members, active and inactive. The initial amortization period for investment gains / losses is five years.

<sup>3</sup> Net of investment expenses.

SECTION III - ACCOUNTING

**EMPLOYER FINANCIAL STATEMENTS UNDER GASB #68**

**D. Deferred Inflows and Outflows of Resources under GASB #68 for the Year Ended June 30, 2015 (Continued) <sup>1</sup>**

Amounts reported as collective deferred inflows / (outflows) of resources to be recognized in pension expense:

Year Ending June 30:

2016	\$	113,484,995
2017	\$	113,484,995
2018	\$	113,484,993
2019	\$	(379,776,673)
2020	\$	(105,330,627)
Thereafter	\$	(49,410,582)

<sup>1</sup> The effort and cost to re-create financial statement information for 10 years was not practical. Information was prepared prospectively from June 30, 2013 for GASB #68 purposes.

SECTION III - ACCOUNTING

**EMPLOYER FINANCIAL STATEMENTS UNDER GASB #68**

**E. Pension Expense under GASB #68 for the Year Ended June 30, 2015**

1. Service cost	
a. Total service cost <sup>1</sup>	\$ 836,085,151
b. Member contributions	(689,187,215)
c. Administrative and other expenses <sup>2</sup>	<u>9,988,889</u>
d. Net employer service cost	\$ 156,886,825
2. Plan amendments	\$ -
3. Interest cost <sup>3</sup>	\$ 3,019,050,250
4. Expected return on assets <sup>4</sup>	\$ (2,711,245,299)
5. Recognition of deferred (inflows) / outflows of resources related to:	
a. Liability experience (gains) / losses	\$ 126,961,457
b. Assumption changes (gains) / losses	-
c. Investment (gains) / losses	<u>(240,446,452)</u>
d. Total: (5)(a) + (5)(b) + (5)(c)	\$ (113,484,995)
6. Total collective pension expense: (1)(d) + (2) + (3) + (4) + (5)(d)	<b>\$ 351,206,781</b>

<sup>1</sup> Mid-year.

<sup>2</sup> Excludes \$24,712 of contributions for system employees.

<sup>3</sup> Includes interest of 4.00% on the total mid-year service cost.

<sup>4</sup> 8.00% net of investment expenses and assuming cash flows occur at mid-year. Includes interest of 4.00% on member contributions and administrative expenses.

SECTION III - ACCOUNTING

**NOTES TO THE FINANCIAL STATEMENTS UNDER GASB #67 AND #68**

**F. Selected Notes to the Financial Statements under GASB #67 and #68**

1. The Public School Retirement System of Missouri is a cost-sharing multiple-employer plan for GASB accounting purposes.
2. Significant actuarial assumptions and other inputs used to measure the total pension liability:
  - Measurement Date                      June 30, 2015
  - Valuation Date                            June 30, 2015
  - Inflation                                    2.50%
  - Total Payroll Growth                    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.
  - Future Salary Increases                4.00% - 10.00%, depending on service and including 2.50% inflation, 0.50% additional inflation due to the inclusion of health care costs in pension earnings, and real wage growth of 1.00% to 7.00%.
  - Cost-of-Living Increases                2.0% compounded annually, beginning on the second January after retirement and capped at 80% lifetime increase.
  - Mortality Assumption
    - Actives:                                    RP 2000 Mortality Table set back one year for males and six years for females, then projected to 2016 using Scale AA
    - Non-Disabled Retirees,  
Beneficiaries and Survivors:        RP 2000 Mortality Table set back one year for both males and females, then projected to 2016 using Scale AA.
    - Disabled Retirees:                      RP 2000 Disabled Mortality Table
  - Experience Study                         The Board of Trustees shall adopt actuarial assumptions, each of which individually represents a reasonable long-term estimate of anticipated experience under the System, derived from experience studies conducted every fifth year. The most recent comprehensive experience study was completed in 2011 and was based on member experience between June 30, 2005 and June 30, 2010. With the exception of the expected return on assets assumption, which was reviewed independently by PSRS investment staff and consultants, all economic and demographic assumptions were reviewed and updated, where appropriate, based on the results of the study and effective with the June 30, 2011 valuation. Since that time, minor changes to the assumptions were made for the July 1, 2012 valuation to reflect changes in the administrative conversion factors for computing optional forms of benefit and a reduction in the assumed interest on member contribution balances. For the July 1, 2013 valuation, future retirement rates were updated to reflect the legislative changes that made the Special Early Retirement ("25-and-out") benefit a permanent feature and extended the enhanced Normal Retirement ("2.55% formula factor") benefit for members who retire with 31 or more years of service for one year. Also, a new assumption was made to distinguish future service accruals for members working in positions covered by Social Security versus those who are not. The next experience study is scheduled to be completed prior to the June 30, 2016 valuation.



SECTION III - ACCOUNTING

**NOTES TO THE FINANCIAL STATEMENTS UNDER GASB #67 AND #68**

**F. Selected Notes to the Financial Statements under GASB #67 and #68 (Continued)**

- Experience Study (Continued)                      Since the most recent experience study, significant new information has become available and new actuarial practices have become prevalent with regard to the mortality assumption. During the next experience study the mortality assumption, including the base mortality table and mortality improvement scale, will be reassessed. It is anticipated that new base mortality tables and a fully generational approach to mortality projection will be recommended and if adopted by the Board, will increase the actuarial liabilities and actuarial determined contribution rates computed in future valuations. The actual impact will depend on the assumption ultimately selected, which will be based in part on the recent experience of plan members as well as other publicly available mortality information. The other actuarial assumptions will also be evaluated and changes to those assumptions may offset or increase the impact.

- Discount Rate    The discount rate used to measure the total pension liability was 8.00% as of June, 30, 2015, and is equal to the long-term expected return on plan investments. The projection of cash flows used to determine the discount rate assumed that employer contributions would be made at the actuarially calculated rate computed in accordance with assumptions and methods stated in the funding policy adopted by the Board, which requires payment of the normal cost and amortization of the unfunded actuarially accrued liability in level percent of employee payroll installments over 30 years utilizing a closed period, layered approach. Based on this assumption, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members.

	1% Decrease (7.00%)	Current Rate (8.00%)	1% Increase (9.00%)
Discount Rate Sensitivity	\$ 10,617,339,855	\$ 5,772,860,112	\$ 1,704,037,041
Net Pension Liability			

3. Classes of plan members covered:

- Retired members, beneficiaries and disabled members receiving benefits:	56,125
- Inactive members (vested and non-vested):	12,079
- Former members:	4,184
- Active Plan Members:	78,314
- Total membership:	150,702

4. Money-weighted rate of return:

The money-weighted rate of return equals the investment performance, net of pension plan investment expenses, and adjusted for the changing amounts actually invested. For the fiscal year ending June 30, 2015, the money-weighted return on the plan assets is 4.3%.

5. The components of the Net Pension Liability for the Public School Retirement System of Missouri as of June 30, 2015, are as follows:

- Total Pension Liability	\$ 40,610,539,616
- Plan Fiduciary Net Position	34,837,679,504
- Net Pension Liability	\$ 5,772,860,112
- Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	85.8%

SECTION III - ACCOUNTING

**REQUIRED SUPPLEMENTARY INFORMATION UNDER GASB #67 AND #68**

**G. Schedule of Changes in the Net Pension Liability and Plan Fiduciary Net Position under GASB #67 and #68 <sup>1</sup>**

Year Ending June 30:	<b>2014</b>	<b>2015</b>
1. Total Pension Liability		
a. Total Pension Liability - Beginning of year	\$ 36,758,165,411	\$ 38,483,183,932
b. Total service cost <sup>2</sup>	849,712,130	836,085,151
c. Interest cost <sup>3</sup>	2,885,182,982	3,019,050,250
d. Experience (gains)/losses	226,591,816	598,417,056
e. Assumption changes	-	-
f. Plan amendments	-	-
g. Benefit payments <sup>4</sup>	(2,236,468,407)	(2,326,196,773)
h. Total Pension Liability - End of year:	\$ 38,483,183,932	\$ 40,610,539,616
2. Plan Fiduciary Net Position		
a. Plan Fiduciary Net Position - Beginning of year	\$ 30,375,416,792	\$ 34,380,608,561
b. Employer contributions <sup>5</sup>	643,989,869	656,924,899
c. Member contributions	679,390,918	689,187,215
d. Non-employer contributing entity contributions	-	-
e. Net investment return	4,927,198,588	1,447,169,203
f. Benefit payments <sup>4</sup>	(2,236,468,407)	(2,326,196,773)
g. Administrative and Other Expenses <sup>5</sup>	(8,919,199)	(10,013,601)
h. Plan Fiduciary Net Position - End of year:	\$ 34,380,608,561	\$ 34,837,679,504

<sup>1</sup> The effort and cost to re-create financial statement information for 10-years was not practical. Information was prepared prospectively from June 30, 2013 for GASB #67 and GASB #68 purposes.

<sup>2</sup> Mid-year.

<sup>3</sup> Includes interest of 4.00% on the mid-year service cost.

<sup>4</sup> Includes refunds of accumulated member contributions and other interfund transfers.

<sup>5</sup> Includes \$24,712 of contributions for system employees.

SECTION III - ACCOUNTING

**REQUIRED SUPPLEMENTARY INFORMATION UNDER GASB #67 AND #68**

**H. Schedule of Net Pension Liability and Related Ratios under GASB #67 and #68** <sup>1</sup>

1.  Year Ending	2.  Total Pension Liability	3.  Plan Fiduciary Net Position	4.  Net Pension Liability  (2) - (3)	5.  Fiduciary Net Position as a Percentage of Total Pension Liability  (3) / (2)	6.  Anticipated Covered Employee Payroll <sup>2</sup>	7.  Net Pension Liability as a Percentage of Covered Payroll  (4) / (6)
6/30/2014	\$ 38,483,183,932	\$ 34,380,608,561	\$ 4,102,575,371	89.3%	\$ 4,425,567,630	92.7%
6/30/2015	\$ 40,610,539,616	\$ 34,837,679,504	\$ 5,772,860,112	85.8%	\$ 4,508,241,581	128.1%

<sup>1</sup> The effort and cost to re-create financial statement information for 10-years was not practical. Information was prepared prospectively from June 30, 2013 for GASB #67 and GASB #68 purposes.

<sup>2</sup> Pensionable pay as provided by PSRS. Gross member compensation, which may include components of compensation not included in pensionable pay, was not made available to PwC.

SECTION III - ACCOUNTING

**REQUIRED SUPPLEMENTARY INFORMATION UNDER GASB #67 AND #68**

**I. Schedule of Contributions under GASB #67 and #68**<sup>1</sup>

1.  Year Ending	2.  Actuarially Determined Contribution <sup>1,2</sup>	3.  Actual Employer Contributions	4.  Contribution Excess / (Deficiency) (Deficiency)  (3) - (2)	5.  Actual Covered Member Payroll	6.  Contributions as a Percentage of Covered Payroll  (3) / (5)
6/30/2006	\$ 608,134,319	\$ 429,578,911	\$ (178,555,408)	\$ 3,735,468,791	11.50%
6/30/2007	644,969,214	472,216,630	(172,752,584)	3,935,138,583	12.00%
6/30/2008	656,347,298	521,241,501	(135,105,797)	4,169,932,008	12.50%
6/30/2009	669,643,988	563,454,487	(106,189,501)	4,334,265,285	13.00%
6/30/2010	658,161,150	594,326,122	(63,835,028)	4,402,415,719	13.50%
6/30/2011	684,366,766	594,732,137	(89,634,629)	4,248,086,693	14.00%
6/30/2012	720,303,976	620,214,231	(100,089,745)	4,277,339,524	14.50%
6/30/2013	507,232,268	634,040,335	126,808,067	4,372,691,966	14.50%
6/30/2014	608,459,393	643,989,869	35,530,476	4,441,309,441	14.50%
6/30/2015	666,438,984	656,924,899	(9,514,085)	4,530,516,545	14.50%

<sup>1</sup> Valuation results prior to June 30, 2009 were computed by the prior actuary.

<sup>2</sup> Employer portion of the Actuarial Determined Contribution, net of member contributions.

SECTION III - ACCOUNTING

**REQUIRED SUPPLEMENTARY INFORMATION UNDER GASB #67 AND #68**

**J. Schedule of Money-Weighted Returns under GASB #67 and #68**<sup>1</sup>

1.	2.
<u>Year Ending</u>	<u>Money-Weighted Rate of Return</u>
6/30/2014	16.7%
6/30/2015	4.3%

<sup>1</sup> The effort and cost to re-create financial statement information for 10-years was not practical. Information was prepared prospectively from June 30, 2013 for GASB #67 and GASB #68 purposes.

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## SECTION IV - CENSUS DATA

### **CENSUS DATA**

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SECTION IV - CENSUS DATA

**A. Reconciliation of Member Counts**

	Actives <sup>1</sup>	Former Members <sup>2</sup>	Inactive Members <sup>3</sup>	Disabled Retirements	Service Retirements <sup>4</sup>	Beneficiary <sup>5</sup>	Total
Total as of June 30, 2014	75,168	3,800	14,451	859	49,707	3,920	147,905
New Memberships	4,992	0	638	0	0	0	5,630
Terminated Members Reinstated	1,781	(1)	(1,780)	0	0	0	0
Refunds	(617)	(921)	(860)	0	0	0	(2,398)
Other Terminations	(670)	690	631	0	0	0	651
Service Retirements	(2,241)	0	(324)	0	2,565	0	0
Disabled Retirements	(52)	0	(14)	66	0	0	0
Death with Beneficiary	(15)	(28)	(3)	(14)	(273)	333	0
Death without Beneficiary <sup>5</sup>	(13)	(8)	(11)	(13)	(654)	(369)	(1,068)
Voided memberships	(19)	0	(5)	0	0	0	(24)
Refund Pending	0	647	(647)	0	0	0	0
Data Adjustments	0	5	3	(2)	0	0	6
Total as of June 30, 2015	78,314	4,184	12,079	896	51,345	3,884	150,702

<sup>1</sup> The number of active members as of June 30, 2015 includes 2,132 members who retired in July 2015.

<sup>2</sup> Terminated and deceased former members whose contributions had yet to be distributed as of the valuation date.

<sup>3</sup> The number of inactive members as of June 30, 2015 includes 28 members who retired in July 2015.

<sup>4</sup> Includes members with benefits on hold that will be re-started at a future date.

<sup>5</sup> The beneficiaries include 200 dependent children whose payment accounts were consolidated with a spouse survivor.

SECTION IV - CENSUS DATA

**B. Member Census Statistics as of June 30, 2015**

	<u>Male</u>	<u>Female</u>	<u>Total</u>
1. Active			
Number <sup>1</sup>	18,040	60,274	78,314
Average Age	42.0	42.0	42.0
Average Years of Service	11.6	11.5	11.5
Anticipated Payroll of Actives <sup>2</sup>	\$ 1,154,068,010	\$ 3,354,173,571	\$ 4,508,241,581
2. Inactive			
Vested			
Number <sup>3</sup>	1,371	6,285	7,656
Annual Deferred Annuities	\$ 17,488,623	\$ 63,156,204	\$ 80,644,827
Non Vested			
Number	932	3,491	4,423
Account Balance	\$ 9,648,516	\$ 36,745,171	\$ 46,393,687
Former Members Entitled to a Deferred Annuity			
Number <sup>4</sup>	22	97	119
Annual Deferred Annuities	\$ 436,032	\$ 1,162,916	\$ 1,598,948
Former Members Entitled to a Refund of Contributions			
Number	784	3,281	4,065
Account Balance	\$ 6,317,175	\$ 28,365,416	\$ 34,682,591
4. Retiree/Beneficiary/Disabled			
Number	15,649	40,476	56,125
Average Age	70.1	69.1	69.4
Annual Benefits Payable <sup>5</sup>	\$ 711,831,918	\$ 1,552,124,646	\$ 2,263,956,564

<sup>1</sup> Includes 2,132 members who retired in July 2015.

<sup>2</sup> Figures shown are the anticipated pay for the one-year period following the valuation date; excludes 2,132 members who retired in July 2015.

<sup>3</sup> Includes 28 members who retired in July 2015.

<sup>4</sup> Former members entitled to a deferred annuity without gender are assumed to be female.

<sup>5</sup> Does not include 2,160 members who retired in July 2015.



SECTION IV - CENSUS DATA

**C. History of Active Member Average Pay, Age, and Service**<sup>1</sup>

1. Valuation Date	2. Active Members	3. Covered Payroll (\$ in Thousands)	4. Average Pay (3) / (2)	5. Annual Percent Change	6. Average Attained Age	7. Average Years of Service
6/30/1995	62,854	\$ 2,137,134	\$ 34,002	3.2%	42.5	12.3
6/30/1996	64,624	2,283,994	35,343	3.9%	42.6	12.3
6/30/1997	66,456	2,427,429	36,527	3.3%	42.5	12.1
6/30/1998	68,709	2,577,594	37,515	2.7%	42.5	11.9
6/30/1999	70,092	2,690,353	38,383	2.3%	42.5	11.7
6/30/2000	71,706	2,836,062	39,551	3.1%	42.5	11.6
6/30/2001	72,688	2,982,051	41,025	3.7%	42.4	11.3
6/30/2002	73,673	3,213,461	43,618	6.3%	42.3	11.2
6/30/2003	74,347	3,373,058	45,369	4.0%	42.4	11.3
6/30/2004	73,797	3,408,230	46,184	1.8%	42.5	11.4
6/30/2005	73,850	3,540,649	47,944	3.8%	42.5	11.4
6/30/2006	75,540	3,775,752	49,983	4.3%	42.4	11.2
6/30/2007	77,121	3,980,698	51,616	3.3%	42.3	11.1
6/30/2008	78,436	4,209,417	53,667	4.0%	42.2	11.1
6/30/2009	79,335	4,439,381	55,957	4.3%	42.2	11.1
6/30/2010	79,256	4,493,865	56,701	1.3%	42.3	11.3
6/30/2011	77,708	4,338,976	55,837	-1.5%	42.3	11.5
6/30/2012	77,529	4,379,060	56,483	1.2%	42.2	11.4
6/30/2013	78,076	4,460,872	57,135	1.2%	42.1	11.4
6/30/2014	75,168	4,425,568	58,876	3.0%	42.2	11.8
6/30/2015 <sup>2</sup>	78,314	4,508,242	59,177	0.5%	42.0	11.5

<sup>1</sup> Valuation results prior to June 30, 2009 were calculated by the prior actuary.

<sup>2</sup> Covered payroll and average pay excludes 2,132 members who retired in July 2015.

SECTION IV - CENSUS DATA

**D. Distribution of Active Members by Salary <sup>1</sup>**

Annual Salary	Number	Percent
Under \$20,000	1,410	1.85%
\$20,000 - 24,999	838	1.10%
\$25,000 - 29,999	1,050	1.38%
\$30,000 - 34,999	1,704	2.24%
\$35,000 - 39,999	4,755	6.24%
\$40,000 - 44,999	9,083	11.92%
\$45,000 - 49,999	10,925	14.34%
\$50,000 - 54,999	10,117	13.27%
\$55,000 - 59,999	8,318	10.92%
\$60,000 - 64,999	6,682	8.77%
\$65,000 - 69,999	5,032	6.61%
\$70,000 - 74,999	3,993	5.24%
\$75,000 - 79,999	2,990	3.92%
\$80,000 - 84,999	2,465	3.24%
\$85,000 - 89,999	1,912	2.51%
\$90,000 - 94,999	1,310	1.72%
\$95,000 - 99,999	1,103	1.45%
\$100,000 & Over	2,495	3.28%
Total	76,182	100.00%

<sup>1</sup> Excludes 2,132 members who retired in July 2015.

SECTION IV - CENSUS DATA

**E. Distribution of Active Members by Age and Service <sup>1</sup>**

Attained Age	Distribution of Active Members by Age and Service as of June 30, 2015							Total
	0 to 4 years	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	Over 30	
<25	2,049		1					2,050
25-29	7,571	2,293						9,864
30-34	3,208	6,467	2,191					11,866
35-39	2,132	2,883	5,371	1,912				12,298
40-44	1,658	1,994	2,462	4,543	1,305			11,962
45-49	1,178	1,556	1,826	2,306	2,944	968	6	10,784
50-54	786	1,157	1,473	1,669	1,482	1,916	457	8,940
55-59	541	708	1,068	1,374	1,257	701	464	6,113
60-64	296	435	562	805	646	377	212	3,333
>=65	120	151	197	225	199	100	112	1,104
Total	19,539	17,644	15,151	12,834	7,833	4,062	1,251	78,314

<sup>1</sup> Includes 2,132 members who retired in July 2015.

SECTION IV - CENSUS DATA

**F. Distribution of Inactive Members by Age and Service <sup>1</sup>**

<b>Attained Age</b>	Distribution of Inactive Members by Age and Service as of June 30, 2015							Total
	0 to 4 years	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	Over 30	
<25	252	1						253
25-29	1,473	84						1,557
30-34	1,003	897	18					1,918
35-39	492	1,110	273	9				1,884
40-44	330	996	353	128	5			1,812
45-49	286	755	337	126	33	1		1,538
50-54	262	659	353	159	56	2		1,491
55-59	176	591	328	167	36	1		1,299
60-64	94	84	49	15	2			244
>=65	55	18	7	3				83
Total	4,423	5,195	1,718	607	132	4		12,079

<sup>1</sup> Includes 28 members who retired in July 2015.

SECTION IV - CENSUS DATA

**G. Distribution of Retired Members, Beneficiaries, and Disabled Members by Age and Number of Years Retired**

<b>Attained Age</b>	Distribution of Retired Members, Beneficiaries, and Disabled Members by Age and Number of Years Retired as of June 30, 2015							
	0 to 4 years	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	Over 30	Total
<50	235	104	56	25	8	9	5	442
50-54	910	135	19	13	7	3	5	1,092
55-59	3,163	1,398	165	25	10	9	5	4,775
60-64	4,477	4,553	1,879	244	26	18	21	11,218
65-69	2,404	5,074	4,963	2,144	53	22	14	14,674
70-74	458	1,653	3,316	3,570	554	42	23	9,616
75-79	85	256	1,007	2,537	1,671	312	51	5,919
80-84	17	42	191	953	1,733	976	184	4,096
85-89	5	10	22	146	682	1,230	543	2,638
>90	2	4	9	24	92	450	1,074	1,655
<b>Total</b>	<b>11,756</b>	<b>13,229</b>	<b>11,627</b>	<b>9,681</b>	<b>4,836</b>	<b>3,071</b>	<b>1,925</b>	<b>56,125</b>

<sup>1</sup> Does not include 2,160 members who retired in July 2015.

SECTION IV - CENSUS DATA

**H. History of Retirees, Beneficiaries, and Disabled Members** <sup>1,2</sup>

Valuation Date	Service Retirees			Disability Retirees			Beneficiaries		
	Added	Removed	End of Year	Added	Removed	End of Year	Added	Removed	End of Year
6/30/1995	1,141	680	19,424	34	32	558	152	66	1,412
6/30/1996	1,344	693	20,075	44	35	567	150	72	1,490
6/30/1997	1,797	732	21,140	30	31	566	170	74	1,586
6/30/1998	1,757	728	22,169	27	32	561	187	82	1,691
6/30/1999	1,965	748	22,386	41	33	569	182	82	1,791
6/30/2000	2,136	763	24,759	43	32	580	187	79	1,899
6/30/2001	2,639	759	26,639	45	29	596	189	89	1,999
6/30/2002	2,262	773	28,128	42	41	597	248	107	2,140
6/30/2003	2,078	783	29,423	37	30	604	197	115	2,222
6/30/2004	2,458	829	31,052	54	28	630	482	156	2,548
6/30/2005	2,639	690	33,001	59	25	664	236	128	2,656
6/30/2006	2,441	811	34,631	41	34	671	279	127	2,808
6/30/2007	2,396	770	36,257	41	29	683	241	161	2,888
6/30/2008	2,596	808	38,045	45	37	691	289	175	3,002
6/30/2009	2,711	797	39,959	39	32	698	382	139	3,245
6/30/2010	2,443	873	41,529	49	25	722	297	161	3,381
6/30/2011	3,141	891	43,779	77	36	763	336	194	3,523
6/30/2012	2,926	810	45,895	70	30	803	304	181	3,646
6/30/2013	2,642	891	47,646	68	28	843	332	161	3,817
6/30/2014	2,868	807	49,707	52	36	859	276	173	3,920
6/30/2015	2,565	927	51,345	66	29	896	333	369 <sup>3</sup>	3,884

<sup>1</sup> Valuation results prior to June 30, 2009 were calculated by the prior actuary.

<sup>2</sup> Does not include 2,160 members who retired in July 2015.

<sup>3</sup> Includes 200 dependent children whose payment accounts were consolidated with a spouse survivor.

SECTION IV - CENSUS DATA

**I. History of Cost of Living Increases to Retired Members**

Retirement In	Effective Date of First COLA	First COLA Percentage Increase	Total Increases Through January 2015 <sup>1</sup>	January 2016 Increase Based on Proposal	Total Increases Through January 2016 <sup>1</sup>	Number of Retired Members at 6/30/2015 <sup>2</sup>
1988 & Earlier	Various	Various	80.00%	0.00%	80.00%	2654
1989	Jan. 1993	3.10%	74.33%	2.00%	77.82%	500
1990	Jan. 1994	3.00%	69.11%	2.00%	72.49%	629
1991	Jan. 1995	2.50%	64.18%	2.00%	67.46%	690
1992	Jan. 1996	3.00%	60.17%	2.00%	63.37%	844
1993	Jan. 1997	2.80%	55.50%	2.00%	58.61%	739
1994	Jan. 1998	2.30%	51.25%	2.00%	54.28%	871
1995	Jan. 1999	1.70%	47.85%	2.00%	50.81%	1058
1996	Jan. 2000	2.00%	45.37%	2.00%	48.28%	1514
1997	Jan. 2001	3.70%	42.53%	2.00%	45.38%	1466
1998	Jan. 2002	3.30%	37.45%	2.00%	40.20%	1698
1999-2001 <sup>3</sup>	Jan. 2003	1.10%	33.07%	2.00%	35.73%	6208
2000-2002 <sup>4</sup>	Jan. 2004	2.10%	31.61%	2.00%	34.24%	2154
2003	Jan. 2005	3.30%	28.90%	2.00%	31.48%	2239
2004	Jan. 2006	2.50%	24.80%	2.00%	27.30%	2526
2005	Jan. 2007	4.30%	21.75%	2.00%	24.19%	2342
2006	Jan. 2008	2.70%	16.73%	2.00%	19.06%	2293
2007	Jan. 2009	5.00%	13.65%	2.00%	15.92%	2446
2008	Jan. 2010	0.00%	8.24%	2.00%	10.40%	2652
2009	Jan. 2011	0.00%	8.24%	2.00%	10.40%	2210
2010	Jan. 2012	2.00%	8.24%	2.00%	10.40%	3118
2011	Jan. 2013	2.00%	6.12%	2.00%	8.24%	2978
2012	Jan. 2014	2.00%	4.04%	2.00%	6.12%	2684
2013	Jan. 2015	2.00%	2.00%	2.00%	4.04%	2891
2014	Jan. 2016	2.00%		2.00%	2.00%	2620
2015						217
<b>Total</b>						<b>52,241</b>

<sup>1</sup> Cumulative lifetime COLA increases are limited to 80%.

<sup>2</sup> Includes Service Retirees and Disabled Retirees as of June 30, 2015; Does not include 2,160 members who retired during July 2015.

<sup>3</sup> Includes all retirements in 1999, and, because of legislation in 2000 and 2001, all persons retiring between July 1, 2000 and December 31, 2000, and between July 1, 2001 and December 31, 2001.

<sup>4</sup> Includes all retirements in 2002, and, because of legislation in 2000 and 2001, all persons retiring between January 1, 2000 and June 30, 2000, and between January 1, 2001 and June 30, 2001.

SECTION IV - CENSUS DATA

**J. Distribution of Retired Members by Type and Monthly Amount**

<u>Monthly</u>	<u>Service</u>	<u>Disability</u>	<u>Retirement Based Survivor</u>	<u>Dependent Based Survivor</u>	<u>Total</u>
Less than \$500	1,365	1	157	16	1,539
\$500-999	3,003	28	338	409	3,778
\$1,000 - 1,499	2,934	109	445	46	3,534
\$1,500 - 1,999	3,161	248	414	26	3,849
\$2,000 - 2,499	4,483	228	411	2	5,124
\$2,500 - 2,999	5,907	152	421	0	6,480
\$3,000 - 3,499	6,393	73	319	0	6,785
\$3,500 - 3,999	6,244	41	246	0	6,531
\$4,000 - 4,499	5,375	10	214	0	5,599
\$4,500 - 4,999	4,150	4	159	0	4,313
\$5,000 -5,499	3,148	1	93	0	3,242
\$5,500 - 5,999	1,948	0	64	0	2,012
\$6,000 & Over	3,234	1	104	0	3,339
Total	51,345	896	3,385	499	56,125

<sup>1</sup> Does not include 2,160 members who retired in July 2015.



SECTION IV - CENSUS DATA

**K. Distribution of Retired Members by Type of Benefit**<sup>1,2</sup>

<u>Type of Benefit</u>	<u>Number</u>	<u>Annual Benefit</u>
Service Retirees		
Options 1 & 10 (Life Only)	27,181	\$ 1,082,378,215
Options 2 & 21 (100% J&S with Pop-Up)	13,504	570,046,719
Options 3 & 31 (75% J&S with Pop-Up)	3,004	138,631,279
Options 4 & 41 (50% J&S with Pop-Up)	5,147	233,758,935
Option 5 (10 Years Certain & Life)	1,516	61,271,602
Option 6 (5 Years Certain & Life)	333	14,313,364
Options 20 (100% J&S)	489	20,401,125
Options 30 (75% J&S)	18	1,097,163
Options 40 (50% J&S)	153	6,550,536
Total	51,345	\$ 2,128,448,938
Disability Retirees	896	\$ 23,984,605
Beneficiaries	3,884	\$ 111,523,020

<sup>1</sup> Does not include 2,160 members who retired in July 2015.

<sup>2</sup> Excludes \$5,000 death benefits and tax sheltered annuities

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SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

**ACTUARIAL ASSUMPTIONS AND METHODS**

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SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

**A. Actuarial Assumptions**

The assumptions used in the valuation were selected and approved by the PSRS Board of Trustees. The demographic assumptions are reviewed every five years through a study of actual experience. In this way, the actuary provides guidance to the Board in selecting the assumptions. The actuary and other economic and investment professionals also provide advice for selecting the economic assumptions. The most recent comprehensive experience study was completed in 2011 and was based on member experience between June 30, 2005 and June 30, 2010.

Since the prior experience study, significant new information has become available and new actuarial practices have become prevalent with regard to the mortality assumption. During the next experience study the mortality assumption, including the base mortality table and mortality improvement scale, will be reassessed. It is anticipated that new base mortality tables and a fully generational approach to mortality projection will be recommended and if adopted by the Board, will increase the actuarial liabilities and actuarial determined contribution rates computed in future valuations. The actual impact will depend on the assumption ultimately selected, which will be based in part on the recent experience of plan members as well as other publicly available mortality information. The other actuarial assumptions will also be evaluated and changes to those assumptions may offset or increase the impact.

Inflation 2.50% per annum

Total Payroll Growth 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

Salary Increases

Service	General Inflation	Health Care Inflation	Longevity	Total 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%
14-15	2.50%	0.50%	2.00%	5.00%
16-17	2.50%	0.50%	1.90%	4.90%
18-19	2.50%	0.50%	1.80%	4.80%
20-21	2.50%	0.50%	1.70%	4.70%
22-23	2.50%	0.50%	1.60%	4.60%
24-25	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%

SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

**A. Actuarial Assumptions (Continued)**

Investment Returns

Funding: 8% per annum (net of investment and administrative expenses).

Accounting: 8% per annum (net of investment expenses).

Cost of Living Adjustments

2.00% per year, 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 applies to service retirements and beneficiary annuities. 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. Members begin receiving COLAs on the second January after benefit commencement. 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

For actives, rates 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:

<u>Age</u>	<u>Male</u>	<u>Female</u>
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

For non-disabled retirees, beneficiaries, and survivors, rates 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:

<u>Age</u>	<u>Male</u>	<u>Female</u>
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	400.000	351.544

SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

**A. Actuarial Assumptions (Continued)**

Mortality Rates (Continued)

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

<u>Age</u>	<u>Male</u>	<u>Female</u>
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

Withdrawal Rates

Termination of membership prior to eligibility for retirement from all causes other than death, disability or retirement, whether resulting in a refund or a deferred benefit, is assumed in accordance with the following illustrative rates per 1,000 members:

<u>Years of Service</u>	<u>Rate</u>
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:

<u>Age</u>	<u>Male and Female Rates</u>
25	0.017
30	0.080
35	0.160
40	0.320
45	0.610
50	0.960
55	1.310

SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

**A. Actuarial Assumptions (Continued)**

Retirement Rates      Retirement is assumed in accordance with the following rates per 1,000 eligible members:

<u>Age</u>	<u>Service</u>											
	<u>&lt;=20</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>&gt;=31</u>
<50	0	0	0	0	0	50	50	50	50	50	450	450
50	0	0	0	0	0	50	50	50	50	50	450	450
51	0	0	0	0	0	50	50	50	50	200	450	450
52	0	0	0	0	0	50	50	50	200	200	450	450
53	0	0	0	0	0	50	50	300	200	200	450	450
54	0	0	0	0	0	50	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

## SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

### A. Actuarial Assumptions (Continued)

Refund of Contributions	<p>It is assumed that 88% of those leaving after earning 5 years of service, but before retirement age, leave their contributions in the fund and receive a vested benefit. The remaining 12% are assumed to take an immediate refund of their contributions, thus forfeiting their vested retirement benefit. For the 88%, if the present value of the deferred benefit is less than the member account balance, the member's account balance is valued.</p> <p>It is assumed that 100% of those leaving prior to earning 5 years of service will take an immediate refund of their contributions.</p>
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 for funding purposes is that investment and administrative expenses are paid from investment income in excess of 8.00% per annum. For accounting purposes the expected return is assumed to be net of investment expenses. Administrative expenses are included in the current year expense.
Dependent Assumptions	<p>80% of male members and 70% of female members are assumed to be married.</p> <p>Beneficiaries are assumed to be of the opposite sex from the member.</p> <p>Male and Female members are assumed to be 4 years older than their beneficiary.</p>
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.
Form of Payment:	For active members, benefits are assumed to be paid in the form of a single life annuity since all optional forms are actuarially equivalent using the same interest and mortality assumptions used in the valuation.
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.

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SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

**A. Actuarial Assumptions (Continued)**

Social Security Coverage

It is assumed that members who are currently employed in positions covered by Social Security will continue to be employed in Social Security covered positions for the remainder of their PSRS tenure. All others are assumed to immediately switch to a position that is not covered by Social Security and receive full PSRS membership credit for future service.

Assumption Changes  
Since the Prior Valuation

There have been no changes in the actuarial assumptions since the June 30, 2014 valuation.



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## SECTION V - ACTUARIAL ASSUMPTIONS AND METHODS

### **B. Actuarial Methods**

The actuarial methods used in the valuation for funding purposes and noted below were selected and approved by the PSRS Board of Trustees. The actuarial methods are generally reviewed in conjunction with experience studies of the assumptions. In this way, the actuary provides guidance to the Board in selecting the methods. The actuarial methods used for financial reporting purposes and noted below are prescribed by GASB 67 and 68.

#### 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.

#### Amortization of Unfunded Actuarial Accrued Liability

For funding, 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 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.

For accounting, gains and losses occurring from census experience different than assumed and assumption changes are amortized into expense over the average expected future service of all plan participants (actives and inactive). Gains and losses occurring from investment experience different than assumed are amortized into expense over a 5-year period. The effect of plan changes on the plan liability are fully recognized in expense in the year in which they occur.

#### Asset Valuation Method

The Actuarial Value of Assets is a smoothed value of assets. The actuarial value at June 30 of the prior year is projected by increasing the amount by 8% interest, adding contributions with 8% interest for half the year, and subtracting benefit payments with 8% interest for half the year. 20% of the difference between the actual returns on market value for the year and the expected return from the projection of the prior year actuarial value, along with corresponding amounts from each of the prior four years, is added to the actuarial value.

For accounting purposes, market value was used.

#### Changes Since the Prior Valuation

There have been no changes in the actuarial methods since the June 30, 2014 valuation.

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SECTION VI - SUMMARY OF PLAN PROVISIONS

**SUMMARY OF BENEFIT PROVISIONS**

Page

A. Summary of Benefit Provisions

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SECTION VI - SUMMARY OF PLAN PROVISIONS

**A. Summary of Benefit Provisions**

Member Contributions	Half the total PSRS contribution rate. For fiscal year 2015, the total PSRS contribution rate is 29.00%.
Normal (Unreduced) Retirement	
Eligibility	Attainment of age 60 with at least five years of Creditable Service, or Completion of 30 years of Creditable Service at any age, or Age plus Creditable Service is at least 80.
Benefit	2.50% of Final Average Salary for each year of Membership Service. A minimum benefit applies for Members with at least 15 years of Creditable Service and varies from \$600/month at 15 years of Creditable Service to \$1,200/month at 30 years of Creditable Service. Benefits are also subject to a maximum equal to 100% of the Member's Final Average Salary at the time of retirement.
Compensation	All regular earnings as an employee of a PSRS-covered employer. Compensation or salary includes, but is not limited to, payments for extra duties, overtime payments, career ladder payments, payments for overloads (e.g. extra hours taught) and additional courses, and employer-paid medical, dental and vision insurance premiums for the member.
Final Average Salary	Average monthly salary over the Member's three highest consecutive years of service. Effective August 28, 2007, the maximum increase in the annual compensation used for the final average salary shall not exceed ten percent.
Membership Service	Service while a participating member of PSRS. Service is measured each year in relation to full contract salary for that year. Members employed in position that are covered by Social Security receives two-thirds for each year of Membership Service earned in those positions.
Prior Service	Service in a covered position prior to July 1, 1946. A year of Prior Service is the equivalent of 0.6 years of Membership Service.
Creditable Service	Membership Service plus any service rendered prior to PSRS inception.

SECTION VI - SUMMARY OF PLAN PROVISIONS

**A. Summary of Benefit Provisions (Continued)**

Normal Form of Benefit	Single Life Annuity												
	Options available include joint and survivor (50%, 75%, or 100%), term certain (60 or 120 months) and life thereafter, and partial lump sum option (PLSO).												
Early (Age Reduced) Retirement													
Eligibility	Attainment of age 55 and under age 60 with at least five years of creditable service.												
Benefit	Normal retirement benefit accrued to the date of early retirement, actuarially reduced from age 60.												
Special Early Retirement Under Modified Formula													
Eligibility	Retirement at an age under 55 and with at least 25 years of creditable service but not eligible for the Rule of 80.												
Benefit	Based on a percentage of final average salary per year of creditable service. Percentages are as follows:												
	<table><thead><tr><th style="text-align: center;"><u>Years of Service</u></th><th style="text-align: center;"><u>Benefit Percentage</u></th></tr></thead><tbody><tr><td style="text-align: center;">25-25.9</td><td style="text-align: center;">2.20%</td></tr><tr><td style="text-align: center;">26-26.9</td><td style="text-align: center;">2.25%</td></tr><tr><td style="text-align: center;">27-27.9</td><td style="text-align: center;">2.30%</td></tr><tr><td style="text-align: center;">28-28.9</td><td style="text-align: center;">2.35%</td></tr><tr><td style="text-align: center;">29-29.9</td><td style="text-align: center;">2.40%</td></tr></tbody></table>	<u>Years of Service</u>	<u>Benefit Percentage</u>	25-25.9	2.20%	26-26.9	2.25%	27-27.9	2.30%	28-28.9	2.35%	29-29.9	2.40%
<u>Years of Service</u>	<u>Benefit Percentage</u>												
25-25.9	2.20%												
26-26.9	2.25%												
27-27.9	2.30%												
28-28.9	2.35%												
29-29.9	2.40%												
Post-Retirement Death Benefit	Regardless of the form of benefit selected, a lump sum benefit of \$5,000 is paid at the death of the retiree.												
COLA Adjustments	<p>The Board has established a policy of providing a 2.00% COLA for years in which the CPI increases between 0.00% and 5.00%. If the CPI increase is greater than 5.00%, the Board will provide a COLA of 5.00%. If the CPI decreases, no COLA is provided.</p> <p>For any member retiring on or after July 1, 2001, such adjustments commence in the second January after commencement of benefits. The total of such increases may not exceed 80% of the original benefit for any member.</p>												

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SECTION VI - SUMMARY OF PLAN PROVISIONS

**A. Summary of Benefit Provisions (Continued)**

Disability Benefits

Definition of Disability	Incapacity for performance of gainful employment after completion of five years of creditable service and before age 60.
Benefit	Lifetime benefit equal to 90% of accrued normal retirement benefit. This benefit level is subject to a minimum of 50% salary in the last full year of membership but not greater than the member's accrued normal retirement benefit assuming continuous employment to age 60 at current pay. COLA adjustments similar to those provided to retirees are provided on this benefit.
Form of Benefit	If eligible, surviving designated spouse or dependent child or parent may elect a monthly survivor benefit.

Vesting

Eligibility	Accrual of five years of creditable service.
Benefit	Accrued normal retirement benefit payable at earliest retirement age based on service at date of termination. Benefit is based on formula in effect at commencement of benefit.

Death/Survivor Benefits

Refund	Refund of accumulated member contributions with interest.
Dependent-Based Survivor Benefits	<p>In lieu of the refund, survivors of a member with at least 2 years of service at death may elect the following survivor benefit package:</p> <ol style="list-style-type: none"><li>1. Spouse who was married to the deceased member for at least three years and with no dependent children - up to \$860 per month payable after spouse age 60 (immediately if spouse is disabled) and prior to remarriage.</li><li>2. Spouse with dependent children<ol style="list-style-type: none"><li>a. Up to \$860 per month payable to spouse with at least one dependent child under age 18.</li><li>b. Up to an additional \$430 per month payable for each child under age 18. Benefits continue to the spouse after the child reaches age 18, up to age 24, if the child is a full-time student.</li><li>c. Family maximum - \$2,160 per month.</li></ol></li></ol>

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SECTION VI - SUMMARY OF PLAN PROVISIONS

**A. Summary of Benefit Provisions (Continued)**

Death/Survivor Benefits  
(continued)

- Dependent-Based Survivor Benefits (continued)
3. If no surviving spouse, each eligible child receives up to \$720 per month payable as in 2.b. above, subject to a family maximum of \$2,160.
  4. If no surviving spouse or children, a benefit of up to \$720 per month is payable to a dependent parent over age 65, subject to a maximum of \$1,440.

No COLA adjustments apply to this benefit.

Retirement-Based Survivor Benefits

In lieu of the benefits described above, if the member has at least 5 years of membership service at date of death, the designated spouse may receive a survivor benefit based on 100% J&S equivalent of the benefit accrued to date of death. The benefit may commence:

1. immediately if member is eligible to retire at date of death, or
2. at a future retirement date of the deceased member.

The benefit may be reduced for early commencement if the deceased member would not have been eligible for unreduced retirement at that date based on service to date of death.

COLA adjustments similar to those provided to retirees are provided on these benefits.

Changes in Benefit Provisions

There have been no changes since the June 30, 2014 valuation.