

**PEERS**

**ACTUARIAL  
VALUATION**

**JUNE 30, 2012**

**Public Education Employee Retirement System of Missouri**

Actuarial Valuation  
as of June 30, 2012





October 19, 2012

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

Dear Members of the Board:

Pursuant to the engagement letter dated October 27, 2008, between PricewaterhouseCoopers LLP ("PwC") and the Public Education Employee Retirement System of Missouri ("PEERS"), we have completed the June 30, 2012 PSRS valuation, based upon the data supplied by PEERS and the benefit provisions currently defined by law.

This valuation provides data on the funding status of PEERS. This valuation is based on the provisions of PEERS in effect as of June 30, 2012, data on the PEERS membership, and information on the asset value of the trust fund. All member data and asset information were provided by PEERS staff. 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 information.

The actuarial assumptions and actuarial cost methods used in this valuation have been approved by the Board and are summarized in Appendix E.

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

The undersigned actuaries are members of the Society of Actuaries and the American Academy of Actuaries, are Enrolled Actuaries, and meet the "General Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States" relating to pension plans. To the best of our knowledge, the individuals involved in this engagement have no relationship that may impair or appear to impair the objectivity of our work.

Respectfully submitted,

PricewaterhouseCoopers LLP

A handwritten signature in black ink that reads "Sheldon A. Gamzon".

Sheldon Gamzon, FSA, EA, MAAA  
Principal

A handwritten signature in black ink that reads "Brandon A. Robertson".

Brandon Robertson, ASA, EA, MAAA  
Director

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## **SUMMARY OF THE VALUATION**

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## PURPOSES OF THE ACTUARIAL VALUATION

At your request, we have performed the actuarial valuation of the Public Education Employee Retirement System of Missouri ("PEERS") as of June 30, 2012.

The purposes of an actuarial valuation are as follows:

- To determine the funding status of PEERS as of the valuation date,
- To determine the contribution rate which would provide for the normal cost of the system plus an amount which will amortize the unfunded actuarial accrued liability within 30 years, and if different, the contribution for the fiscal year ending June 30, 2014, under the statute, and
- To provide accounting and other data required by PEERS.

## REPORT HIGHLIGHTS

The key results of the valuation are summarized in the following table along with comparable values from the prior valuation report:

	<u>June 30, 2011</u>	<u>June 30, 2012</u>
	<u>(\$ in Millions)</u>	
<b>A. Summary of Results</b>		
(1) Present Value of Future Benefits for:		
(a) Active Members	\$ 3,241.2	\$ 3,296.5
(b) Retired Members	1,398.6	1,541.6
(c) Inactive Members	122.4	128.7
(d) Total	\$ 4,762.2	\$ 4,966.8
(2) Present Value of Future Normal Costs	1,212.9	1,220.5
(3) Actuarial Accrued Liability: (1) – (2)	\$ 3,549.3	\$ 3,746.3
(4) Actuarial Value of Assets	3,028.7	3,090.9
(5) Unfunded Actuarial Accrued Liability: (3) – (4)	\$ 520.6	\$ 655.4
(6) Normal Cost Rate	10.80%	10.79%
(7) Unfunded Actuarial Accrued Liability Rate	2.21%	2.78%
(8) Benchmark Contribution Rate for Following Fiscal Year	13.01%	13.57%
(9) Current Contribution Rate, Member + Employer	13.72%	13.72%
(10) Recommended Contribution Rate for Fiscal Year End 2013 and 2014	13.72%	13.72%

	<u>June 30, 2011</u>	<u>June 30, 2012</u>
<b>B. Highlights of Report</b>		
(1) Actuarial Accrued Liability Funding Ratio:		
(a) Actuarial Value of Assets (millions)	\$ 3,028.7	\$ 3,090.9
(b) Actuarial Accrued Liability (millions)	3,549.3	3,746.3
(c) Funding Ratio: (a) / (b)	85.3%	82.5%
(2) Active Members:		
(a) Number:		
Male	12,470	12,615
Female	<u>36,330</u>	<u>35,990</u>
Total	48,800	48,605
(b) Compensation for Fiscal Year (millions):		
Male	\$ 437.1	\$ 446.3
Female	<u>977.3</u>	<u>991.0</u>
Total	\$ 1,414.4	\$ 1,437.3
(c) Average Age:		
Male	48.2	48.3
Female	47.8	48.0
Total	47.9	48.1
(d) Average Service:		
Male	7.6	7.6
Female	8.6	8.7
Total	8.3	8.4
(e) Average Compensation for Fiscal Year:		
Male	\$ 35,055	\$ 35,382
Female	\$ 26,901	\$ 27,534
Total	\$ 28,984	\$ 29,571
(f) Average Amount of Assets per Active Member (based on actuarial value):	\$ 31,166	\$ 29,601
(3) Retired Members and Beneficiaries:		
(a) Number Service Retired:		
Life Annuities	13,671	14,327
Options	<u>5,773</u>	<u>6,210</u>
Total	19,444	20,537
(b) Number Disability Retired:	620	668
(c) Number Survivors, Beneficiaries:	<u>1,264</u>	<u>1,357</u>
(d) Total Persons Receiving Benefits:	21,328	22,562
(e) Average Monthly Pension Being Paid at Valuation Date for New Service Retired <sup>1</sup> :	\$ 767	\$ 753
(f) Average Amount of Assets per Service Retired (based on actuarial value):	\$ 67,874	\$ 70,743
(g) Average Amount of Assets per New Service Retired (based on actuarial value):	\$ 115,227	\$ 101,895

<sup>1</sup>Average New Benefit is Original Option 1 benefit prior to conversion to alternate payment plans, including the Accelerated Payment Plan.

## MEMBERSHIP CHARACTERISTICS

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### Active and Inactive Membership

A total of 76,797 active and inactive members of PEERS are included in the 2012 actuarial valuation.

Active members	48,605
Inactive members <sup>1</sup>	<u>28,192</u>
Total active and inactive members	76,797

Between the 2011 and 2012 actuarial valuations, the number of active employees decreased by 195, or 0.4%, from 48,800 to 48,605. The average annual salaries of employees increased by 2.0% to \$29,571.

### Summary of Changes in Membership

	<u>Male</u>	<u>Female</u>	<u>Total</u>
Active and Inactive Members 6/30/2011	15,772	48,430	64,202
Additions:			
New Memberships	1,959	4,104	6,063
Terminated Members Reinstated	<u>0</u>	<u>0</u>	<u>0</u>
Total Additions	1,959	4,104	6,063
Decreases:			
Service Retirements	462	1,244	1,706
Disability Retirements	23	44	67
Withdrawals	1,012	2,431	3,443
Deaths	49	59	108
Other Terminations	459	1,324	1,783
Reciprocity	<u>0</u>	<u>1</u>	<u>1</u>
Total Decreases	2,005	5,103	7,108
Adjustments <sup>1</sup>	<u>(6)</u>	<u>6</u>	<u>0</u>
Active and Inactive Members 6/30/2012	15,720	47,437	63,157
Additional Members Valued <sup>2</sup>	5,149	8,491	13,640
Total Valuation Membership at 6/30/2012	20,869	55,928	76,797

<sup>1</sup>Gender was corrected for six members.

<sup>2</sup>Includes 1,356 deceased members and 12,284 terminated members whose contributions had yet to be distributed as of the valuation date.



## Benefit Recipients

On June 30, 2012, PEERS was paying benefits to 22,475 retired members, beneficiaries and survivors. In addition, 87 members had benefits that were on hold due to returning to work. The headcount for current benefit recipients for valuation purposes increased 5.8% from 21,328 on June 30, 2011, to 22,562 on June 30, 2012. The June 30, 2012 headcount consists of 20,537 service retirees, 668 disability retirees, and 1,357 beneficiaries and survivors.

There are two classes of retired members – members retired because of service and members retired because of disability.

The changes among the retired group of members during the prior year were as follows:

	<u>Service Retirements</u>	<u>Disability Retirements</u>	<u>Beneficiaries</u>	<u>Total</u>
Retired Members 6/30/2011	19,354	617	1,263	21,234
Additions:				
New Retirees/Beneficiaries	1,680	65	152	1,897
Benefits Taken Off Hold	<u>32</u>	<u>2</u>	<u>0</u>	<u>34</u>
Total Additions	1,712	67	152	1,931
Decreases:				
Died During Year	586	17	59	662
Benefits Placed On Hold	<u>26</u>	<u>2</u>	<u>0</u>	<u>28</u>
Total Decreases	<u>612</u>	<u>19</u>	<u>59</u>	<u>690</u>
Retired Members 6/30/2012	20,454	665	1,356	22,475
Additional Members Valued <sup>1</sup>	83	3	1	87
Total Valuation Membership at 6/30/2012	20,537	668	1,357	22,562

<sup>1</sup> Includes retired members with benefits on hold that earned additional retirement benefits.

As of June 30, 2012, the average monthly benefit payable to new service retirees was \$753 compared to \$767 as of June 30, 2011. These average benefit amounts and the amounts shown in the tables that follow include all post-retirement benefit increases.

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## ACTUARIAL ASSUMPTIONS AND METHODS

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An experience study was completed during 2011 in order to review and update (as needed) the actuarial assumptions and methods. As a result, some of the assumptions and methods were updated for the June 30, 2011 valuation. The only assumption changes for the June 30, 2012 valuation were a reduction in the assumed interest credited to member contributions from 2.00% to 1.00% and removal of a 0.75% liability load due to implementation of new actuarial operating factors for annuity conversion and age-reduced retirement that incorporate an assumed post-retirement COLA of 2.00% per year. These changes had a very minor impact on the liability of the system. All significant assumptions are the same as those used in the June 30, 2011 valuation.

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### EXPERIENCE DURING FY 2012

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Overall, the system experienced a net actuarial loss of \$132.0 million.

The total net actuarial loss for the year ending June 30, 2012, is shown below and is broken out further in Table 18:

	<u>(\$ in millions)</u>
1. Actuarial (Gain)/Loss on Assets (at actuarial value)	\$ 186.5
2. Actuarial (Gain)/Loss on Liabilities Due to Legislative Changes	0.0
3. Actuarial (Gain)/Loss on Liabilities Due to Assumption Changes	0.0
4. Actuarial (Gain)/Loss on Unfunded Liabilities Due to Reinstated and Purchased Service	1.7
5. Actuarial (Gain)/Loss on Liabilities Due to Salary, Demographic, Other Experience	<u>(56.2)</u>
6. Total Actuarial (Gain)/Loss (Sum 1-5)	\$ 132.0

For the plan year ending June 30, 2012, the funds experienced an asset loss of \$186.5 million; based on actuarial value of assets. The use of the five year smoothing method to determine the actuarial value of assets recognizes 20% of the total gain or loss for each of the preceding five years.

The reinstatement of forfeited service generated a liability loss of approximately \$0.7 million. The purchase of service other than reinstated service generated a liability loss of approximately \$1.1 million.

Demographic experience was a gain of \$56.2 million, primarily due to salary increases being less than assumed.

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## **PEERS BENEFITS**

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A summary of the current benefit provisions appears in Appendix F. There were no changes to the benefit provisions of PEERS during the 2012 session of the Legislature which impact the results of this valuation.

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## **ASSET INFORMATION**

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The market value of the assets available for benefits has increased from \$2.92 billion as of June 30, 2011 to \$2.96 billion as of June 30, 2012. The actuarial value of assets increased from \$3.03 billion as of June 30, 2011, to \$3.09 billion as of June 30, 2012. Actuarial value of assets exceeds the market value by \$0.13 billion.

Based on the actuarial value, the assets of the fund returned approximately 1.9% which compares to the market value return of 1.4%. The difference is due to the recognition of investment losses from prior years under the asset smoothing method used to determine the actuarial value of assets.

The detailed determinations of asset values utilized in this valuation and asset growth in the last year are set forth in Appendix B.

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## **FUNDING STATUS**

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The funding status of PEERS 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 (smoothed) value of assets, the funding ratio increased from 79.1% at June 30, 2010 to 85.3% at June 30, 2011, and then decreased to 82.5% as of June 30, 2012.

Using the market value of assets, the funding ratio increased from 65.7% at June 30, 2010 to 82.2% at June 30, 2011, and then decreased to 79.1% as of June 30, 2012.

## **GASB DISCLOSURE**

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PEERS produces its accounting statements under GASB Statement Number 25. In Table 16, you will find Required Supplemental Information mandated by that statement.

This information is presented in draft form for review by the System's auditor. Please let us know if there are any changes so that we may maintain consistency with the System's financial statements.

## **FUNDING PROCESS**

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In the 2003 session of the Legislature, the funding provisions of PEERS were amended. The following changes were adopted:

1. The limitation on the total contribution rate (10% of pay) was eliminated.
2. Contribution rates will now be established by actuarial valuation.
3. The annual increase in the total contribution rate may not exceed 0.5% of pay.

In the 2007 session of the Legislature, it was determined that the unfunded actuarial accrued liabilities associated with benefit changes shall be amortized over a twenty-year period.

During Fiscal 2011, the Board adopted a funding policy, which identified a number of goals and actions that the Board would take to stabilize the contribution rate and improve the funded position of the plan. The funding policy as we understand it is presented in Appendix E.

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## **APPENDICES**

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**APPENDIX A**  
**MEMBERSHIP DATA**

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**Table 1****Number, Average Age-Service-Salary, and Total Payroll  
of Active Members Included in Actuarial Valuations****Male**

<b>Item</b>	<b>Actuarial Valuation as of June 30</b>				
	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Number	12,481	12,600	12,511	12,470	12,615
Average Age	47.6	47.8	48.0	48.2	48.3
Average Years of Service	7.0	7.1	7.6	7.6	7.6
Average Annual Salary	\$ 33,447	\$ 33,932	\$ 34,622	\$ 35,055	\$ 35,382
Total Payroll (000's)	\$ 417,454	\$ 427,538	\$ 433,160	\$ 437,135	\$ 446,345

**Female**

<b>Item</b>	<b>Actuarial Valuation as of June 30</b>				
	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Number	38,384	38,634	37,852	36,330	35,990
Average Age	46.5	46.8	47.4	47.8	48.0
Average Years of Service	7.4	7.6	8.2	8.6	8.7
Average Annual Salary	\$ 25,012	\$ 25,624	\$ 26,433	\$ 26,901	\$ 27,534
Total Payroll (000's)	\$ 960,052	\$ 989,947	\$ 1,000,531	\$ 977,307	\$ 990,965

**Total**

<b>Item</b>	<b>Actuarial Valuation as of June 30</b>				
	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Number	50,865	51,234	50,363	48,800	48,605
Average Age	46.8	47.1	47.5	47.9	48.1
Average Years of Service	7.3	7.5	8.0	8.3	8.4
Average Annual Salary	\$ 27,082	\$ 27,667	\$ 28,467	\$ 28,984	\$ 29,571
Total Payroll (000's)	\$ 1,377,506	\$ 1,417,485	\$ 1,433,691	\$ 1,414,442	\$ 1,437,310

**Table 2**

**Employee Distribution by Age and Years of Service  
June 30, 2012**

<b>Age</b>	<b>Years of Service</b>							<b>Total</b>
	<b>0-4</b>	<b>5-9</b>	<b>10-14</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>30 &amp; Over</b>	
Under 25	1,291	28	0	0	0	0	0	1,319
25-29	2,358	555	10	0	0	0	0	2,923
30-34	1,946	999	286	16	0	0	0	3,247
35-39	2,120	1,215	577	120	4	0	0	4,036
40-44	2,466	1,825	923	308	96	5	0	5,623
45-49	2,298	2,244	1,653	702	236	112	18	7,263
50-54	2,110	2,225	2,059	1,277	458	232	115	8,476
55-59	1,736	1,714	1,721	1,337	770	280	125	7,683
60-64	1,039	1,221	977	786	544	242	140	4,949
65 & Over	664	894	612	356	222	149	189	3,086
<b>Total</b>	<b>18,028</b>	<b>12,920</b>	<b>8,818</b>	<b>4,902</b>	<b>2,330</b>	<b>1,020</b>	<b>587</b>	<b>48,605</b>



**Table 3**  
**Salary Distribution**  
**Employees in Active Service**  
**on June 30, 2012**

Annual Salary	Number	Percent
Under \$5,000	1,747	3.5%
\$5,000 - 9,999	2,701	5.6%
\$10,000 - 14,999	4,528	9.3%
\$15,000 - 19,999	7,088	14.6%
\$20,000 - 24,999	7,688	15.8%
\$25,000 - 29,999	6,496	13.4%
\$30,000 - 34,999	5,235	10.8%
\$35,000 - 39,999	4,033	8.3%
\$40,000 - 44,999	2,947	6.1%
\$45,000 - 49,999	2,096	4.3%
\$50,000 - 54,999	1,257	2.6%
\$55,000 - 59,999	879	1.8%
\$60,000 - 64,999	535	1.1%
\$65,000 - 69,999	404	0.8%
\$70,000 - 74,000	264	0.5%
\$75,000 & Over	<u>707</u>	<u>1.5%</u>
<b>Total</b>	<b>48,605</b>	<b>100.0%</b>

**Table 4**

**Salary Increase Rates by Service Group  
Employees Earning a Full Year of Service in Fiscal 2011 and 2012**

<b>Service as of June 30, 2012</b>	<b>Number</b>	<b>Average Percent Increase In Salary</b>	
		<b>Expected</b>	<b>Actual</b>
Under 5	13,150	6.8%	2.2%
5-9	10,496	6.0%	2.8%
10-14	7,765	5.5%	3.0%
15-19	3,758	5.1%	2.7%
20 & Over	<u>3,195</u>	<u>5.0%</u>	<u>2.4%</u>
<b>Total</b>	<b>38,364</b>	<b>5.9%</b>	<b>2.5%</b>

**Table 5**

**Pensions in Force on June 30, 2012  
by Type and Monthly Amount**

<b>Monthly</b>	<b>Service</b>	<b>Disability</b>	<b>Beneficiary</b>	<b>Total</b>
Less than \$100	1,431	29	166	1,626
\$100 - 199	3,637	141	294	4,072
\$200 - 299	3,001	134	249	3,384
\$300 - 399	2,264	114	166	2,544
\$400 - 499	1,656	66	126	1,848
\$500 - 999	4,830	158	258	5,246
\$1,000 - 1,499	2,068	23	66	2,157
\$1,500 & Over	<u>1,650</u>	<u>3</u>	<u>32</u>	<u>1,685</u>
<b>Total</b>	<b>20,537</b>	<b>668</b>	<b>1,357</b>	<b>22,562</b>

**Table 6**

**Pensions in Force on June 30, 2012  
by Type and Age**

<b>Age</b>	<b>Service</b>	<b>Disability</b>	<b>Beneficiary</b>	<b>Total</b>
Under 55	191	154	125	470
55-59	778	169	82	1,029
60-64	3,072	129	126	3,327
65-69	4,682	103	152	4,937
70-74	4,170	59	201	4,430
75-79	3,119	38	220	3,377
80-84	2,347	12	202	2,561
85-89	1,386	3	171	1,560
90 & Over	<u>792</u>	<u>1</u>	<u>78</u>	<u>871</u>
<b>Total</b>	<b>20,537</b>	<b>668</b>	<b>1,357</b>	<b>22,562</b>

**Table 7**

**Cost of Living Increases to Retired Members  
June 30, 2012**

<b>Retirement In</b>	<b>Effective Date of First COLA</b>	<b>First COLA Percentage Increase</b>	<b>Total Increases Through January 2012</b>	<b>January 2013 Increase</b>	<b>Total Increases Through January 2013</b>	<b>Number of Retired Members at 6/30/12<sup>1</sup></b>
1986 & Earlier	Various	Various	80.00%	0.00%	80.00%	808
1987	Jan. 1991	4.00%	78.90%	0.62%	80.00%	209
1988	Jan. 1992	4.70%	72.01%	2.00%	75.45%	301
1989	Jan. 1993	3.10%	64.27%	2.00%	67.56%	299
1990	Jan. 1994	3.00%	59.35%	2.00%	62.54%	368
1991	Jan. 1995	2.50%	54.71%	2.00%	57.80%	379
1992	Jan. 1996	3.00%	50.93%	2.00%	53.95%	418
1993	Jan. 1997	2.80%	46.53%	2.00%	49.46%	441
1994	Jan. 1998	2.30%	42.52%	2.00%	45.37%	496
1995	Jan. 1999	1.70%	39.32%	2.00%	42.11%	563
1996	Jan. 2000	2.00%	36.99%	2.00%	39.73%	600
1997	Jan. 2001	3.70%	34.31%	2.00%	37.00%	671
1998	Jan. 2002	3.30%	29.52%	2.00%	32.11%	666
1999	Jan. 2003	1.10%	25.39%	2.00%	27.90%	770
2000	Jan. 2004	2.10%	24.02%	2.00%	26.50%	823
2001	Jan. 2005	3.30%	21.46%	2.00%	23.89%	819
2002	Jan. 2006	2.50%	17.60%	2.00%	19.95%	868
2003	Jan. 2007	4.30%	14.73%	2.00%	17.02%	950
2004	Jan. 2008	2.70%	10.00%	2.00%	12.20%	996
2005	Jan. 2009	5.00%	7.10%	2.00%	9.24%	1,039
2006	Jan. 2010	0.00%	2.00%	2.00%	4.04%	1,069
2007	Jan. 2011	0.00%	2.00%	2.00%	4.04%	1,223
2008	Jan. 2012	2.00%	2.00%	2.00%	4.04%	1,238
2009	Jan. 2013	2.00%		2.00%	2.00%	1,325
2010						1,711
2011						1,712
2012						<u>443</u>
<b>Total</b>						<b>21,205</b>

<sup>1</sup> Includes Service Retirees and Disabled Retirees as of June 30, 2012.

**Table 8****Analysis of Retired Membership by Type of Benefit  
(Dollar Amounts in Millions)  
June 30, 2012**

<b>Type of Benefit</b>	<b>Number</b>	<b>Annual Benefit</b>	<b>Total Liability</b>
Service Retirees			
Options 1 & 10 (Life Only)	14,327	\$105.1	\$864.0
Options 2 & 21 (100% J&S with Pop-Up)	3,407	33.7	321.7
Option 3 & 31 (75% J&S with Pop-Up)	479	6.7	62.6
Option 4 & 41 (50% J&S with Pop-Up)	868	12.6	109.6
Option 5 (10 Years Certain & Life)	668	4.9	42.3
Option 6 (5 Years Certain & Life)	207	1.6	13.9
Option 20 (100% J&S)	115	0.6	4.8
Option 30 (75% J&S)	1	0.0	0.0
Option 40 (50% J&S)	15	0.1	0.8
Accelerated Payment	<u>450</u>	<u>3.8</u>	<u>33.1</u>
<b>Total</b>	<b>20,537</b>	<b>\$169.1</b>	<b>\$1,452.8</b>
Disability Retirees	668	\$3.2	\$30.1
Beneficiaries	1,357	\$6.6	\$58.6

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**APPENDIX B**  
**ASSET INFORMATION**

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**Table 9****Market Value of Assets  
Balance Sheet**

	<b>June 30, 2011</b>	<b>June 30, 2012</b>
<b>Assets:</b>		
Cash	\$ 8,654,593	\$ 13,481,385
Contribution Receivable	15,933,372	17,250,538
Accrued Interest and Dividends	7,233,238	9,425,579
Investments	3,084,593,038	3,255,560,165
Trades Pending	209,549,831	158,184,669
Other Assets	69,489	32,783
Capital Assets	0	0
Prepaid Expenses	0	0
Due from PSRS	<u>0</u>	<u>0</u>
Total	\$ 3,326,033,561	\$ 3,453,935,119
<b>Liabilities:</b>		
Accounts Payable	\$ 1,878,174	\$ 1,698,340
Employer Pay Liability	521,598	558,276
Interest Payable	142,035	55,051
Trades Pending	401,631,910	484,249,817
Net OPEB Obligation	299,092	375,649
Other Liabilities	2,290,236	2,092,307
Due to PSRS	<u>506,898</u>	<u>348,642</u>
Total	\$ 407,269,943	\$ 489,378,082
<b>Net Assets</b>	<b>\$ 2,918,763,618</b>	<b>\$ 2,964,557,037</b>



Table 10

**Statement of Revenue and Expenses  
Market Value Reconciliation For Fiscal Year Ended June 30, 2012**

<b>Operating Revenues</b>	<b>Amount</b>
Contributions:	
Employers	\$ 95,094,785
Members	<u>101,930,717</u>
Total Contributions	197,025,502
Net Investment Income:	
Interest	20,722,903
Dividends	16,788,336
Net Income from Security Lending Activities	<u>948,152</u>
Total Investment Income	38,459,391
Investment Return	
Net Capital Appreciation / (Depreciation)	7,946,323
Investment Expenses	<u>(6,631,919)</u>
Total Investment Return	1,314,404
Other Income	0
Total Operating Revenues	236,799,297
<b>Operating Expenses</b>	
Benefit Payments	166,945,359
Refunds to Members	18,469,530
Administrative Expenses	5,590,988
Other Expenses	<u>0</u>
Total Operating Expenses	191,005,877
<b>Excess of Revenues over Expenses</b>	<b>\$ 45,793,420</b>
<b>Fund Balance, June 30, 2011</b>	<b><u>2,918,763,618</u></b>
<b>Fund Balance, June 30, 2012</b>	<b>\$ 2,964,557,038</b>

Table 11

Growth of Cash Flow  
(In Thousands)

Year Ending June 30	Contributions for the Year	Payments During the Year			External Cash Flow for the Year	Covered Payroll	Payments as Percent of Covered Payroll
		Benefit Payments and Refund of Contributions	Expenses	Total			
1987	\$ 21,986	\$ (9,641)	\$ (500)	\$ (10,141)	\$ 11,845	\$ 268,173	3.8%
1988	23,927	(10,886)	(538)	(11,424)	12,503	304,029	3.8
1989	26,110	(12,567)	(585)	(13,152)	12,958	331,352	4.0
1990	28,176	(14,643)	(712)	(15,355)	12,821	359,577	4.3
1991	30,505	(16,634)	(721)	(17,355)	13,150	389,080	4.5
1992	31,470	(18,858)	(813)	(19,671)	11,799	398,147	4.9
1993	32,640	(21,025)	(821)	(21,846)	10,794	415,672	5.3
1994	35,298	(23,772)	(901)	(24,673)	10,625	452,339	5.5
1995	38,706	(27,067)	(905)	(27,972)	10,734	495,449	5.6
1996	42,122	(30,338)	(1,233)	(31,571)	10,551	538,022	5.9
1997	49,009	(34,425)	(1,950)	(36,375)	12,634	556,534	6.5
1998	54,844	(38,460)	(2,652)	(41,112)	13,732	616,303	6.7
1999	60,385	(41,813)	(1,604)	(43,417)	16,967	685,272	6.3
2000	68,684	(51,432)	(1,920)	(53,352)	15,332	735,362	7.3
2001	75,434	(58,239)	(2,246)	(60,485)	14,949	814,158	7.4
2002	91,990	(67,737)	(2,574)	(70,311)	21,679	895,420	7.8
2003	97,927	(75,432)	(2,946)	(78,378)	19,549	971,177	8.1
2004	100,602	(85,290)	(3,210)	(88,500)	12,102	984,866	9.0
2005	108,809	(95,798)	(3,564)	(99,362)	9,447	1,055,204	9.4
2006	129,763	(104,704)	(4,358)	(109,062)	20,701	1,190,989	9.2
2007	142,306	(116,880)	(4,427)	(121,307)	20,999	1,275,199	9.5
2008	159,359	(129,573)	(4,681)	(134,254)	25,105	1,377,506	9.7
2009	175,343	(142,340)	(5,440)	(147,780)	27,563	1,417,485	10.4
2010	187,403	(152,508)	(5,280)	(177,787)	29,615	1,433,691	11.0
2011	186,608	(169,592)	(5,611)	(175,203)	11,405	1,414,442	12.4
2012	197,026	(185,415)	(5,591)	(191,006)	6,020	1,437,310	13.3

**Table 12**

**Development of the Actuarial Value of Assets**

1. Actuarial Value of Assets June 30, 2011		\$ 3,028,757,171
2. Activity for FY 2012		
a. Contributions	\$ 197,025,502	
b. Benefits and Expenses	<u>(191,005,877)</u>	
c. Net Cash Flow	6,019,625	
3. Expected Returns	242,541,359	
4. Assets Before Allocation of G/L (1+2+3)		3,277,318,155
5. Actual Returns for 2012	39,773,795	
6. Excess Returns for 2012 (5-3)	(202,767,564)	
7. Recognized Excess Returns		
2012	(40,553,513)	
2011	54,216,915	
2010	7,315,249	
2009	(141,391,162)	
2008	<u>(66,025,676)</u>	
Total		<u>(186,438,187)</u>
8. Actuarial Value of Assets June 30, 2012		\$ 3,090,879,968

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**APPENDIX C**  
**ACTUARIAL DETERMINATIONS**

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**Table 13**

**Ten Year Historical Summary  
(All Dollar Figures in Thousands)**

	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Active Members	46,863	45,880	46,598	48,188	49,281	50,865	51,234	50,363	48,800	48,605
Retired Members	14,837	15,445	16,142	16,760	17,539	18,288	19,248	20,158	21,328	22,562
Actuarial Assets	\$ 1,677,770	\$ 1,837,308	\$ 2,011,566	\$ 2,218,638	\$ 2,481,562	\$ 2,703,762	\$ 2,792,182	\$ 2,892,411	\$ 3,028,757	\$ 3,090,880
UAAL	\$ 371,946	\$ 383,902	\$ 402,928	\$ 538,195	\$ 501,250	\$ 574,840	\$ 665,862	\$ 766,302	\$ 520,591	\$ 655,467
Benefit Payments and Refunds	\$ 75,432	\$ 85,290	\$ 95,798	\$ 104,704	\$ 116,880	\$ 129,573	\$ 142,340	\$ 152,508	\$ 169,592	\$ 185,415
Accumulated Members' Contributions	\$ 394,925	\$ 444,318	\$ 466,259	\$ 524,014	\$ 580,853	\$ 650,970	\$ 693,962	\$ 743,146	\$ 783,112	\$ 822,485
APV of Retirees' Benefits	\$ 731,059	\$ 804,864	\$ 904,292	\$ 1,020,486	\$ 1,093,650	\$ 1,215,036	\$ 1,305,025	\$ 1,392,753	\$ 1,398,620	\$ 1,541,541

**Table 14**

**Determination of Normal Cost  
For the 2012 - 2013 Plan Year**

	<b>Dollar (mid-year)<sup>1</sup></b>	<b>Rate<sup>2</sup></b>
<b>Active Members</b>		
Retirement Benefits	\$ 121,714,364	8.46%
Termination Benefits	28,262,821	1.97%
Death Benefits	3,698,228	0.26%
Disability Benefits	<u>1,391,747</u>	<u>0.10%</u>
<b>Total Normal Cost</b>	\$ 155,067,160	10.79%
Estimated Employee Payroll	\$1,437,310,138	
Employee Contribution Rate	6.86%	
<b>Estimated Employee Contributions</b>	<u>98,599,475</u>	
<b>Employer Normal Cost</b> (Total Normal Cost less Employee Contributions)	\$ 56,467,685	

<sup>1</sup> Normal cost amounts include a 1.50% load for anticipated losses on service purchases.

<sup>2</sup> Normal cost rate was determined using an expected payroll of \$1,437,310,138.

**Table 15**

**Determination of the Unfunded Actuarial Accrued Liability  
June 30, 2012**

**Active Members:**

Service Retirement	\$ 2,077,412,521
Death Benefits	46,798,096
Disability Benefits	11,563,338
Termination Benefits	(59,688,275)
Inactives	<u>128,720,349</u>
Total for Active and Inactive Members	\$ 2,204,806,029

**Pay Status Members:**

Service Retirees	\$ 1,452,845,692
Disability Retirees	30,103,316
Survivors	<u>58,592,269</u>
Total for Pay Status Members	\$ 1,541,541,277

Total Actuarial Accrued Liability \$ 3,746,347,306

Actuarial Value of Assets 3,090,879,968

**Total Unfunded Actuarial Accrued Liability** \$ 655,467,338

Table 16

GASB 25 Exhibits

Schedule of Funding Progress  
(\$ In Thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a)/c)
6/30/2003	1,677,770	2,049,716	371,946	81.9%	971,177	38.3%
6/30/2004	1,837,308	2,221,210	383,902	82.7%	984,866	39.0%
6/30/2005	2,011,566	2,414,494	402,928	83.3%	1,055,204	38.2%
6/30/2006	2,218,638	2,756,833	538,195	80.5%	1,190,994	45.2%
6/30/2007	2,481,562	2,982,813	501,250	83.2%	1,275,199	39.3%
6/30/2008	2,703,762	3,278,602	574,840	82.5%	1,377,506	41.7%
6/30/2009	2,792,182	3,458,044	665,862	80.7%	1,417,485	47.0%
6/30/2010	2,892,411	3,658,713	766,302	79.1%	1,433,691	53.4%
6/30/2011	3,028,757	3,549,348	520,591	85.3%	1,414,442	36.8%
6/30/2012	3,090,880	3,746,347	655,467	82.5%	1,437,310	45.6%

Schedule of Employer Contributions

Fiscal Year Ending	Annual Required Contribution	Employer Contribution	Percentage Contributed
6/30/2003	52,847,992	48,933,326	92.6%
6/30/2004	62,315,910	49,976,898	80.2%
6/30/2005	73,948,917	53,109,687	71.8%
6/30/2006	79,707,834	61,745,505	77.5%
6/30/2007	89,945,503	69,235,160	77.0%
6/30/2008	90,727,016	77,988,839	86.0%
6/30/2009	96,775,289	85,915,562	88.8%
6/30/2010	95,821,957	91,478,725	95.5%
6/30/2011 <sup>1</sup>	90,816,155	90,816,155	100.0%
6/30/2012 <sup>1</sup>	95,094,785	95,094,785	100.0%

<sup>1</sup> Annual Required Contribution determined by applying the benchmark contribution rate (13.72%), net of the employee contribution rate (6.86%), to the estimated payroll on which contributions were made (\$1,386,221,356).

Notes in Trend Data

Information:

Valuation Date  
Actuarial Cost Method  
Amortization Method  
  
Asset Valuation Method

Data

6/30/2012  
Entry Age Normal  
Level Percent for 30 years, Open prior to June 30, 2011,  
Closed Beginning June 30, 2011  
5-Year Smoothing of Actual Returns  
Less Expected Returns on Actuarial Value,  
Marked to Market as of June 30, 2003

Actuarial

Investment rate of return  
Projected salary increases  
Cost-of-living adjustments

8.00%  
5.00% - 12.00%  
2.00%



**Table 17**

**Unfunded Actuarial Accrued Liability  
June 30, 2012**

	<u>Amount</u>
(1) Present Value of Future Benefits for:	
Active Members	\$ 3,296,489,574
Service Retirees	1,452,845,692
Disability Retirees	30,103,316
Beneficiaries and Survivors	58,592,269
Inactive Members	<u>128,720,349</u>
Total	\$ 4,966,751,200
(2) Present Value of Future Normal Costs	<u>1,220,403,894</u>
(3) Actuarial Accrued Liability ((1)-(2))	\$ 3,746,347,306
(4) Actuarial Value of Assets	<u>3,090,879,968</u>
(5) Unfunded Actuarial Accrued Liability ((3)-(4))	\$ 655,467,338

**Required Contribution Rate and Amortization of Unfunded Liability  
for the Fiscal Year Ending 2014**

	<u>Percentage of Payroll</u>
(1) Normal Cost Rate <sup>1</sup>	10.79%
(2) Unfunded Actuarial Accrued Liability Rate	<u>2.78%</u>
(3) Benchmark Contribution Rate - Normal Cost Plus a Rate to fund UAAL over 30 Years <sup>2</sup> [(1)+(2)]	13.57%
(4) Total Contribution Rate, Member + Employer, for Fiscal Year 2013	13.72%
(5) Recommended Total Contribution Rate, Member + Employer, for Fiscal Year 2014	13.72%

<sup>1</sup> Normal cost rate was determined at mid-year using an expected payroll of \$1,437,310,138.

<sup>2</sup> Contribution rate to amortize the UAAL was determined using expected payroll of \$1,437,310,138. The benchmark contribution shown here reflects a 20-year amortization of additional liabilities resulting from changes in benefit provisions as amended in the 2007 legislative session. This resulted in an increase in UAAL of \$1,120,898 as of June 30, 2007.

**Table 18**

**Analysis of Actuarial Gains and Losses**

	<u>Amount</u>
1. Unfunded Actuarial Liability as of June 30, 2011	\$ 520,591,292
2. Normal Cost for 2012 Plan Year (Mid-year)	152,693,840
3. Contribution Expected to be Received During Year (Benchmark Rate)	(184,018,923)
4. Interest to Year End @ 8.00% on 1., 2., and 3.	<u>40,394,300</u>
5. Expected Unfunded Actuarial Liability as of June 30, 2012	\$ 529,660,509
6. Contribution (Excess)/Shortfall	(6,170,647)
7. Actuarial (Gain)/Loss During the Year	
a. From Investment	186,438,187
b. From Actuarial Liabilities Due to Legislative Changes	0
c. From Actuarial Liabilities Due to Assumption Changes	0
d. From Unfunded Actuarial Liabilities Due to Reinstated Service	666,555
e. From Unfunded Actuarial Liabilities Due to Other Purchased Service	1,078,152
f. From Actuarial Liabilities Due to Actual vs. Expected COLA <sup>1</sup>	
g. From Actuarial Liabilities Due to Actual vs. Expected Salary Changes	(46,592,366)
h. From Actuarial Liabilities Due to Demographic and Other Experience <sup>2</sup>	<u>(9,613,052)</u>
i. Total	131,977,476
8. Actual Unfunded Actuarial Liability as of June 30, 2012	\$ 655,467,338

<sup>1</sup> For COLA granted January 1, 2013 (2.0%).

<sup>2</sup> Includes Actuarial Liabilities for new members and data corrections.

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**APPENDIX D**  
**ADDITIONAL MEMBERSHIP DATA**

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**Table 19****Schedule of Active Member Valuation Data**

<b>Actuarial Valuation Date</b>	<b>Number of Members</b>	<b>Covered Annual Payroll (000)</b>	<b>Average Annual Salary</b>	<b>% Increase in Average Salary</b>	<b>Average Attained Age</b>	<b>Average Years of Service</b>
6/30/1992	28,410	\$ 398,147	\$ 14,014	2.8%	45.7	7.6
6/30/1993	29,055	415,672	14,306	2.1%	45.7	7.7
6/30/1994	30,662	452,339	14,752	3.1%	45.5	7.6
6/30/1995	32,598	495,449	15,199	3.0%	45.3	7.3
6/30/1996	34,153	538,022	15,753	3.6%	45.2	7.2
6/30/1997	35,982	556,534	15,467	-1.8%	45.1	7.1
6/30/1998	38,672	616,303	15,937	3.0%	44.8	6.7
6/30/1999	41,599	685,272	16,473	3.4%	44.6	6.5
6/30/2000	43,533	735,400	16,893	2.5%	44.5	6.4
6/30/2001	45,517	814,158	17,887	5.9%	44.6	6.3
6/30/2002	46,728	895,420	19,162	7.1%	44.8	6.4
6/30/2003	46,863	971,177	20,724	8.2%	45.3	6.6
6/30/2004	45,880	984,866	21,466	3.6%	46.2	7.0
6/30/2005	46,598	1,055,204	22,645	5.5%	46.6	7.1
6/30/2006	48,188	1,190,994	24,716	9.1%	46.4	7.1
6/30/2007	49,281	1,275,199	25,876	4.7%	46.6	7.2
6/30/2008	50,865	1,377,506	27,082	4.7%	46.8	7.3
6/30/2009	51,234	1,417,485	27,667	2.2%	47.1	7.5
6/30/2010	50,363	1,433,691	28,467	2.9%	47.5	8.0
6/30/2011	48,800	1,414,442	28,984	1.8%	47.9	8.3
6/30/2012	48,605	1,437,310	29,571	2.0%	48.1	8.4

Table 20

Solvency Test  
(\$ in 000's)

Actuarial Valuation Date	Actuarial Accrued Liability				Percentage of Actuarial Liabilities Covered by Net Assets for:		
	Member Contributions (1)	Current Retirees & Beneficiaries (2)	Active & Inactive Members Employer Financed Portion (3)	Net Assets Available for Benefits	(1)	(2)	(3)
6/30/1995	169,846	252,034	364,519	778,325	100.0%	100.0%	97.8%
6/30/1996	185,763	293,937	399,861	876,886	100.0%	100.0%	99.3%
6/30/1997	204,757	312,390	447,065	1,001,035	100.0%	100.0%	108.2%
6/30/1998	225,454	350,860	460,033	1,150,311	100.0%	100.0%	124.8%
6/30/1999	231,252	396,846	540,413	1,335,308	100.0%	100.0%	130.9%
6/30/2000	274,167	467,653	653,480	1,522,660	100.0%	100.0%	119.5%
6/30/2001	301,936	565,126	769,014	1,686,242	100.0%	100.0%	106.5%
6/30/2002	354,296	651,295	850,391	1,810,619	100.0%	100.0%	94.7%
6/30/2003	394,925	731,059	923,732	1,677,770	100.0%	100.0%	59.7%
6/30/2004	444,318	804,864	972,028	1,837,308	100.0%	100.0%	60.5%
6/30/2005	466,259	904,292	1,043,943	2,011,566	100.0%	100.0%	61.4%
6/30/2006	524,014	1,020,486	1,212,333	2,218,638	100.0%	100.0%	55.6%
6/30/2007	580,853	1,093,650	1,308,310	2,481,562	100.0%	100.0%	61.7%
6/30/2008	650,970	1,215,036	1,412,596	2,703,762	100.0%	100.0%	59.3%
6/30/2009	693,962	1,305,025	1,459,057	2,792,182	100.0%	100.0%	54.4%
6/30/2010	743,146	1,392,753	1,522,813	2,892,411	100.0%	100.0%	49.7%
6/30/2011	783,112	1,398,620	1,367,616	3,028,757	100.0%	100.0%	61.9%
6/30/2012	822,485	1,541,541	1,382,321	3,090,880	100.0%	100.0%	52.6%

**Table 21**

**Schedule of Retirees and Beneficiaries Added to  
and Removed From Valuation Headcount**

Actuarial Valuation Date	Service Retirees			Disability Retirees			Beneficiaries		
	Added	Removed	End of Year	Added	Removed	End of Year	Added	Removed	End of Year
6/30/1992	715	316	8,904	28	7	196	46	5	260
6/30/1993	689	336	9,257	26	10	215	40	7	293
6/30/1994	658	358	9,557	29	9	235	60	9	344
6/30/1995	782	372	9,967	33	19	249	54	12	386
6/30/1996	799	390	10,376	26	8	267	47	18	415
6/30/1997	823	388	10,811	22	13	276	63	18	460
6/30/1998	841	424	11,218	29	17	288	59	22	497
6/30/1999	813	431	11,600	35	7	316	67	19	545
6/30/2000	945	432	12,113	45	14	347	76	20	601
6/30/2001	987	468	12,632	53	22	378	76	14	663
6/30/2002	980	471	13,141	30	21	387	97	18	742
6/30/2003	979	501	13,619	31	13	405	96	25	813
6/30/2004	1,081	541	14,159	44	18	431	86	44	855
6/30/2005	1,116	505	14,770	43	26	448	98	29	924
6/30/2006	1,080	528	15,322	53	23	478	86	50	960
6/30/2007	1,250	563	16,009	29	18	489	120	39	1,041
6/30/2008	1,256	569	16,696	46	21	514	99	62	1,078
6/30/2009	1,439	578	17,557	45	18	541	113	41	1,150
6/30/2010	1,471	670	18,358	51	15	577	140	67	1,223
6/30/2011	1,681	595	19,444	74	31	620	114	73	1,264
6/30/2012	1,680	587	20,537	65	17	668	152	59	1,357

Table 22

Schedule of Retirees by Type  
(\$ in 000's)

Actuarial Valuation Date	Service Retirees		Disability		Beneficiaries	
	Number	Benefits	Number	Benefits	Number	Benefits
6/30/1997	10,811	27,250	276	616	460	1007
6/30/1998	11,218	30,240	288	672	497	1,126
6/30/1999	11,600	35,395	316	826	545	1,384
6/30/2000	12,113	41,091	347	1002	601	1,653
6/30/2001	12,632	50,512	378	1,232	663	2,038
6/30/2002	13,141	57,697	387	1,346	742	2,413
6/30/2003	13,619	63,860	405	1,449	813	2,752
6/30/2004	14,159	70,710	431	1,558	855	3,076
6/30/2005	14,770	78,435	448	1,709	924	3,569
6/30/2006	15,322	85,639	478	1,873	960	3,736
6/30/2007	16,009	95,809	489	2,011	1,041	4,277
6/30/2008	16,696	105,791	514	2,177	1,078	4,582
6/30/2009	17,557	118,462	541	2,406	1,150	4,998
6/30/2010	18,358	125,648	577	2,595	1,223	5,474
6/30/2011	19,444	138,045	620	2,848	1,264	5,842
6/30/2012	20,537	169,146	668	3,206	1,357	6,581

Average New Retiree Statistics

Actuarial Valuation Date	New Service Retirees	Average New Benefit <sup>1</sup>	% Change From Previous Year
6/30/1997	823	327.16	(1)
6/30/1998	805	324.82	(1)
6/30/1999	813	366.42	13
6/30/2000	945	431.89	18
6/30/2001	987	565.29	31
6/30/2002	980	660.51	17
6/30/2003	979	676.19	2
6/30/2004	1,081	665.97	(2)
6/30/2005	1,116	652.87	(2)
6/30/2006	1,080	676.06	4
6/30/2007	1,250	717.59	6
6/30/2008	1,256	760.85	6
6/30/2009	1,282	781.95	3
6/30/2010	1,359	710.30	(9)
6/30/2011	1,371	767.06	8
6/30/2012	1,662	752.68	(11)

<sup>1</sup>Average New Benefit is Original Option 1 benefit prior to conversion to alternate payment plans, including the Accelerated Payment Plan.

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**APPENDIX E**  
**ACTUARIAL ASSUMPTIONS AND METHODS**

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## **STATEMENT OF FUNDING POLICY**

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In order to establish long-term, consistent methods in the funding of the System, the Board of Trustees has adopted a funding policy. The funding of the System shall be carried out in such a way that the burden of paying retirement costs shall be shared equitably by present and succeeding generations of members and taxpayers. To this end, the following principles shall apply:

1. 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.
2. The actuarial funding method used shall be the Entry Age Normal Method with normal costs calculated as a percentage of payroll.
3. It shall be the general objective to maintain an amortization period of 30 years or less in the funding of the Unfunded Actuarial Accrued Liability. Whenever a change is made in the System's benefit and contribution rate structures, the amortization period for the System after this change should not exceed 30 years initially. The benchmark contribution shown has been adjusted for the 20 year amortization of unfunded liabilities due to changes in benefit provisions as amended in the 2007 legislative session.
4. If an escalation in future payroll is assumed in determining the amortization payments toward the Unfunded Actuarial Accrued Liability, then the annual rate of such escalation shall not exceed the expected rate of expansion in total System payroll based upon the actuarial assumptions.
5. Assets used in the actuarial valuation shall be valued by smoothing investment gains and losses over a period of five years.
6. Annual actuarial valuations shall be made of the System's assets and liabilities. The contribution rate shall be established based on the results of these valuations.

It is the Board's intent to maintain a contribution rate of 13.72% until the unfunded actuarial accrued liability is fully amortized to the extent the rate remains sufficient to do so.

The actuarial assumptions and methods used in this valuation were selected and approved by the Board. In general, the methods provide orderly funding of all benefits being accrued, as well as unfunded past-service benefit liabilities, over a period of thirty years. However, the smoothing method employed in determining the Actuarial Value of Assets may accelerate or lengthen the effective funding period, depending on whether gains or losses are experienced. In our opinion, the actuarial methods are reasonable for the purposes of this valuation. A summary of the actuarial assumptions and methods is provided on the following pages.

## ACTUARIAL ASSUMPTIONS

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### Inflation

Inflation is assumed to be 2.50% per annum.

### Payroll Growth

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

### Salary and Payroll Increases

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

### Investment Return

It is assumed that investments of the System will return, on average, a yield of 8% per annum compound, net of system expenses (investment and administrative expenses).

## Cost of Living Adjustments

The cost of living adjustment assumed in the valuation is 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. The total lifetime COLA cannot exceed 80% of the original benefit. Future COLAs for current benefit recipients reflect actual cumulative adjustments granted at the time of valuation.

## Mortality Rates

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

### Active Member Mortality

<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
80	49.322	22.752
90	156.083	66.254
100	324.963	179.896
110	400.000	279.055

### Mortality Rates (cont.)

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

<b>Service Retiree, Beneficiary and Survivor Mortality</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
20	0.263	0.148
30	0.461	0.225
40	1.004	0.554
50	1.831	1.274
60	5.930	4.665
70	19.292	15.452
80	61.340	41.002
90	187.360	125.502
100	352.933	233.696
110	400.000	364.617

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

<b>Disability Retiree Mortality</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
40	22.571	7.450
50	28.975	11.535
60	42.042	21.839
70	62.583	37.635
80	109.372	72.312
90	183.408	140.049
100	344.556	237.467

## Retirement Rates

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

### Active Member Retirement Prior to July 1, 2013

Age	Service										
	<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>&gt;=30</u>
<50	0	0	0	0	0	50	50	50	50	50	150
50	0	0	0	0	0	50	50	50	50	50	250
51	0	0	0	0	0	50	50	50	50	250	150
52	0	0	0	0	0	50	50	50	250	150	150
53	0	0	0	0	0	50	50	250	150	150	150
54	0	0	0	0	0	50	250	150	150	150	150
55	30	30	30	30	30	270	170	170	170	170	170
56	30	30	30	30	130	170	170	170	170	170	170
57	30	30	30	130	30	170	170	170	170	170	170
58	30	30	130	30	30	170	170	170	170	170	170
59	30	130	30	30	30	170	170	170	170	170	170
60	160	160	160	160	160	160	160	160	160	160	160
61	100	100	100	100	100	100	100	100	100	100	100
62	240	240	240	240	240	240	240	240	240	240	240
63	200	200	200	200	200	200	200	200	200	200	200
64	140	140	140	140	140	140	140	140	140	140	140
65	260	260	260	260	260	260	260	260	260	260	260
66	200	200	200	200	200	200	200	200	200	200	200
67	200	200	200	200	200	200	200	200	200	200	200
68	200	200	200	200	200	200	200	200	200	200	200
69	200	200	200	200	200	200	200	200	200	200	200
70	200	200	200	200	200	200	200	200	200	200	200
71	200	200	200	200	200	200	200	200	200	200	200
72	200	200	200	200	200	200	200	200	200	200	200
73	200	200	200	200	200	200	200	200	200	200	200
74	200	200	200	200	200	200	200	200	200	200	200
>=75	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

**Retirement Rates (cont.)**

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

**Active Member Retirement After July 1, 2013**

<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>&gt;=30</u>
<50	0	0	0	0	0	0	0	0	0	0	150
50	0	0	0	0	0	0	0	0	0	0	250
51	0	0	0	0	0	0	0	0	0	250	150
52	0	0	0	0	0	0	0	0	250	150	150
53	0	0	0	0	0	0	0	250	150	150	150
54	0	0	0	0	0	0	250	150	150	150	150
55	30	30	30	30	30	270	170	170	170	170	170
56	30	30	30	30	130	170	170	170	170	170	170
57	30	30	30	130	30	170	170	170	170	170	170
58	30	30	130	30	30	170	170	170	170	170	170
59	30	130	30	30	30	170	170	170	170	170	170
60	160	160	160	160	160	160	160	160	160	160	160
61	100	100	100	100	100	100	100	100	100	100	100
62	240	240	240	240	240	240	240	240	240	240	240
63	200	200	200	200	200	200	200	200	200	200	200
64	140	140	140	140	140	140	140	140	140	140	140
65	260	260	260	260	260	260	260	260	260	260	260
66	200	200	200	200	200	200	200	200	200	200	200
67	200	200	200	200	200	200	200	200	200	200	200
68	200	200	200	200	200	200	200	200	200	200	200
69	200	200	200	200	200	200	200	200	200	200	200
70	200	200	200	200	200	200	200	200	200	200	200
71	200	200	200	200	200	200	200	200	200	200	200
72	200	200	200	200	200	200	200	200	200	200	200
73	200	200	200	200	200	200	200	200	200	200	200
74	200	200	200	200	200	200	200	200	200	200	200
>=75	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

## Withdrawal Rates

Termination of membership prior to eligibility for retirement from all causes other than death, 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	300.0
1	220.0
2	150.0
3	120.0
4	100.0
5	81.0
10	48.0
15	33.0
20	18.0
25+	0.0

## Refund of Contributions

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

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

## 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>
30	0.080
35	0.160
40	0.320
45	0.640
50	1.040
55	1.680

### **Interest on Member Accounts**

1.00% per annum.

### **Service Purchases**

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

### **Provisions for Expenses**

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

### **Asset Valuation Method**

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

### **Dependent Assumptions**

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

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

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

### **Return of Unused Member Account Balance**

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



## **Data Assumptions**

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

## **Assumption Changes Since the Prior Valuation**

The 0.75% load to recognize the subsidy present in the joint and survivor reduction factors calculated without provision for cost-of-living adjustments was removed since new operating factors incorporating the 2% COLA assumption have been implemented.

Assumed interest on member contributions has been reduced from 2.00% to 1.00%.

## **ACTUARIAL METHODS**

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### **Actuarial Cost Method**

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

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

### **Asset Valuation Method**

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

### **Amortization of Unfunded Actuarial Accrued Liability**

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

Increases or decrease 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.

### **Method Changes Since the Prior Valuation**

None.

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**APPENDIX F**  
**SUMMARY OF PEERS BENEFIT PROVISIONS**

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## **MEMBER CONTRIBUTIONS**

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Half the total PEERS contribution rate. For fiscal year 2011, the current total PEERS contribution rate is 13.72% of pay and may increase 0.5% each year.

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## **NORMAL (UNREDUCED) RETIREMENT**

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### **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**

1.61% of Final Average Salary for each year of Membership Service. A year of Prior Service is treated as 0.6 year of Membership Service. Any person retiring prior to age 62 under the Rule of 80 or with 30 years of creditable service will receive an additional benefit payable to attainment of age 62. This benefit is equal to 0.8% of Final Average Salary for each year of Membership Service.

### **Compensation**

All regular earnings as an employee of a PEERS-covered employer. Compensation or salary includes, but is not limited to, payments for extra duties, overtime payments 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 twenty percent.

### **Membership Service**

Service while a participating member of PEERS. Service is measured each year in relation to minimum salary for 20 hours per week in the position for that year.

### **Prior Service**

Service rendered in a covered position prior to November 1, 1965.

### **Creditable Service**

Membership Service plus any Prior Service.

### **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, partial lump sum option (PLSO), and accelerated payment plan (APP).

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## **EARLY (AGE REDUCED) RETIREMENT**

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### **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.

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## **SPECIAL NORMAL RETIREMENT – UNDER MODIFIED FORMULA**

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### **Eligibility**

Retirement on or before July 1, 2014 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:

<u>Years of Service</u>	<u>Benefit Percentage</u>
25-25.9	1.51%
26-26.9	1.53
27-27.9	1.55
28-28.9	1.57
29-29.9	1.59

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## **COLA ADJUSTMENTS**

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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.

For any member such adjustments commence in the fourth January after commencement of benefits. The total of such increases may not exceed 80% of the original benefit for any member.

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## **DISABILITY BENEFITS**

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### **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. Form of Benefit.

### **Form of Benefit**

If eligible, surviving spouse may elect a survivor benefit. COLA adjustments similar to those provided retirees are provided on this benefit.

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## **VESTING**

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### **Eligibility**

Completion 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**

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### **Refund**

Refund of accumulated member contributions with interest

### **Survivor Benefits**

If the member has at least 5 years of creditable service at date of death, the 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 retirees are provided on these benefits.