

**PUBLIC SCHOOL RETIREMENT SYSTEM OF MISSOURI**  
ACTUARIAL VALUATION AS OF JUNE 30, 2007

October 18, 2007 DRAFT

Board of Trustees  
Public School Retirement System of Missouri  
3210 West Truman Boulevard  
Jefferson City, MO 65109

Dear Members of the Board:

We are pleased to present the report of the actuarial valuation of the Public School Retirement System of Missouri ("PSRS") as of June 30, 2007.

This valuation provides data on the funding status of PSRS. The results of the valuation show that the current contribution level will no longer fund the current benefits of PSRS within the framework of your funding policy.

This valuation is based on the provisions of PSRS in effect as of June 30, 2007, data on the PSRS membership and information on the asset value of the trust fund. All member data and asset information were provided by PSRS staff. While certain checks for reasonableness were performed, the data was used unaudited.

The actuarial assumptions and actuarial cost method used in this valuation are those used in the prior actuarial valuation of PSRS.

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 practice.

Respectfully submitted,

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## **SUMMARY OF THE VALUATION**

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# PURPOSES OF THE ACTUARIAL VALUATION

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At your request we have performed the actuarial valuation of the Public School Retirement System of Missouri ("PSRS") as of June 30, 2007.

The purposes of an actuarial valuation are as follows:

- To determine the funding status of PSRS 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 over 30 years, and if different, the contribution for the fiscal year ending June 30, 2009, under the statute, and
- To provide accounting and other data required by PSRS.

## REPORT HIGHLIGHTS

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The key results of the valuation are summarized in the following table and compared to comparable values from the prior valuation report:

	<u>June 30, 2006</u>	<u>June 30, 2007</u>
	<u>(\$ in Millions)</u>	
<b>A. Summary of Results</b>		
(1) Present Value of Future Benefits for:		
(a) Active Members	\$ 22,069.8	\$ 23,177.9
(b) Retired Members	15,371.3	17,059.6
(c) Inactive Members and Other Liabilities	<u>382.0</u>	<u>410.0</u>
(d) Total	\$ 37,823.1	\$ 40,647.5
(2) Present Value of Future Normal Costs	\$ 7,786.0	\$ 8,250.8
(3) Actuarial Accrued Liability: (1) – (2)	\$ 30,037.1	\$ 32,396.7
(4) Actuarial Value of Assets	\$ 24,801.6	\$ 27,049.0
(5) Unfunded Actuarial Accrued Liability: (3) – (4)	\$ 5,235.5	\$ 5,347.7
(6) Total Contribution Rate, Member + Employer	24.00%	25.00%
(7) Normal Cost Rate	21.55%	21.60%
(8) Approximate Rate Available for Unfunded Actuarial Accrued Liability: (6) – (7)	2.45%	3.40%
(9) 30-Year Contribution Rate	28.39%	28.24%
(10) Recommended Contribution Fiscal Year End 2008 and 2009 Based on Statutes	25.00%	26.00%

	<u>June 30, 2006</u>	<u>June 30, 2007</u>
<b>B. Highlights of Report</b>		
(1) Actuarial Accrued Liability Funding Ratio:		
(a) Actuarial Value of Assets	\$ 24,801.6	\$ 27,049.0
(b) Actuarial Accrued Liability	30,037.1	32,396.7
(c) Funding Ratio: (a) / (b)	82.6%	83.5%
(2) Active Members:		
(a) Number:		
Male	17,169	17,477
Female	<u>58,371</u>	<u>59,644</u>
Total	75,540	77,121
(b) Total Compensation for Fiscal Year (for Active Members at end of year):		
Male	\$ 947.5	\$ 993.4
Female	<u>2,828.3</u>	<u>2,987.3</u>
Total	\$ 3,775.8	\$ 3,980.7
(c) Average Age:		
Male	42.3	42.2
Female	42.4	42.3
Total	42.4	42.3
(d) Average Service:		
Male	11.5	11.3
Female	11.1	11.1
Total	11.2	11.1
(e) Average Compensation for Fiscal Year (not in millions):		
Male	\$ 55,186	\$ 56,842
Female	<u>48,453</u>	<u>50,085</u>
Total	\$ 49,983	\$ 51,616
(f) Average Amount of Assets per Active Member (based on actuarial value, not in millions)	\$ 119,782	\$ 124,213
(3) Retired Members and Beneficiaries		
(a) Number Service Retired:		
Life Annuities	18,010	18,553
Options	<u>16,621</u>	<u>17,704</u>
Total	34,631	36,257
(b) Number Disability Retired	671	683
(c) Number Survivors, Beneficiaries	<u>2,808</u>	<u>2,888</u>
(d) Total Persons Receiving Benefits	38,110	39,828
(e) Average Monthly Pension Being Paid at Valuation Date for New Service Retired, Including Options (not in millions)	\$ 2,946	\$ 2,995
(f) Average Amount of Assets per Retired Member (based on actuarial value, not in millions)	\$ 403,340	\$ 428,332
(g) Average Amount of Assets per New Service Retired (based on actuarial value, not in millions)	\$ 546,032	\$ 555,913

# MEMBERSHIP CHARACTERISTICS

## ACTIVE AND INACTIVE MEMBERSHIP

A total of 88,728 active and inactive members of PSRS are included in this 2007 actuarial valuation.

Active members	77,121
Inactive members	<u>11,607</u>
Total active and inactive members	88,728

Between the 2006 and 2007 actuarial valuations, the number of active employees increased by 1,581 or 2.1%. The average annual salaries of employees increased by 3.3% to \$51,616.

### Summary of Changes in Membership

	<u>Male</u>	<u>Female</u>	<u>Total</u>
Active and Inactive Members 7/1/2006	19,385	67,908	87,293
New Membership 7/1/2006 to 6/30/2007	<u>1,483</u>	<u>4,929</u>	<u>6,412</u>
Total Membership Before Decreases	20,868	72,837	93,705
Decreases:			
Service Retirements	605	1,764	2,369
Disability Retirements	7	34	41
Withdrawals	549	1,649	2,198
Deaths	19	32	51
Other Terminations	59	232	291
Previous Memberships Voided	9	16	25
Reciprocity	<u>1</u>	<u>1</u>	<u>2</u>
Subtotal	1,249	3,728	4,977
Net membership 6/30/2007 (includes Inactive Members)	19,619	69,109	88,728

## Benefit Recipients

On June 30, 2007, PSRS was paying benefits to a total of 39,828 retired members, beneficiaries and survivors. The total number of benefit recipients increased 4.5% from 38,110 on June 30, 2006. The benefit recipients were comprised of 36,257 service retirees, 683 disability retirees, and 2,888 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 2006-2007 year were as follows:

	<u>Service Retirements</u>	<u>Disability Retirements</u>	<u>Beneficiaries</u>	<u>Total</u>
Retired Members, July 1, 2006	34,631	671	2,808	38,110
Added During Year	2,376	41	237	2,654
Died During Year	(757)	(26)	(88)	(871)
Resumed Retirement During Year	20	0	4	24
Resumed Employment During Year	(13)	(3)	(73)	(89)
Retired Members, June 30, 2007	<u>36,257</u>	<u>683</u>	<u>2,888</u>	<u>39,828</u>

As of June 30, 2007, the average monthly benefit payable to service retirees was \$2,923 compared to \$2,790 as of June 30, 2006. These average benefit amounts and the amounts shown in the tables that follow include all post-retirement benefit increases.

## **ACTUARIAL ASSUMPTIONS AND METHODS**

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The actuarial cost method and assumptions used in this valuation are the same as those disclosed in the actuarial valuation report as of June 30, 2006. Refinements to the valuation process resulted in an increase on actuarial accrued liability of roughly one percent. This set of assumptions and methods is described in Appendix E.

## **EXPERIENCE DURING FY 2007**

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Overall the system experienced a net actuarial gain of about \$488.1 million.

The total net actuarial gain for the year ending June 30, 2007, is shown below and is broken out further in Table 22:

	<u>(\$ in millions)</u>
1. Actuarial (Gain) or Loss on Assets (at actuarial value)	(\$726.0)
2. Actuarial (Gain) or Loss on Liabilities Due to 4.30% actual COLA vs. 3.25% expected	149.5
3. Actuarial (Gain) or Loss on Unfunded Liabilities Due to Reinstated and Purchased Service	38.3
4. Actuarial (Gain) or Loss on Liabilities Due to Legislative Changes	32.9
5. Actuarial (Gain) or Loss on Liabilities Due to Salary, Demographic and Other Experience	17.2
6. Total Actuarial (Gain) or Loss (Sum 1-6)	<u>(\$488.1)</u>



For the plan year ending June 30, 2007, the funds experienced an asset gain of \$726.0 million. The use of the five year smoothing method to determine the actuarial value of assets recognizes 20% of the total gain for the year.

COLA increases were more than expected producing a loss of \$149.5 million. The reinstatement of forfeited service generated a liability loss of approximately \$37.7 million that was offset by member contributions of \$14.4 million. The net increase in the unfunded actuarial liability, including interest on member contributions to the valuation date, was \$22.7 million. The purchase of service other than reinstated service generated a liability loss of approximately \$48.2 million that was offset by member contributions of \$31.4 million. The net increase in the unfunded actuarial liability, including interest on member contributions to the valuation date, was \$15.6 million.

## **PSRS BENEFITS**

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A summary of the current benefit provisions appears in Appendix F. There were changes to the benefit provisions of PSRS during the 2007 session of the Legislature which impact the results of this valuation. Effective August 28, 2007, the 25-and-out provision was extended through July 1, 2013. The 25-and-out provision provides the opportunity for members who are under age 55 with between 25 and 30 years of credited service and do not meet the Rule of 80 to retire with a reduced benefit. Also, the enhanced benefit multiplier of 2.55% for members retiring with at least 31 years of service was extended until July 1, 2013. Effective August 28, 2007, the maximum increase in the annual compensation for the final average salary shall not exceed ten percent.

## **ASSET INFORMATION**

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The market value of the assets of the fund, which are available for benefits, has increased from \$25.6 billion at the end of FY 2006 to \$29.3 billion at the end of FY 2007. Due to the smoothing process used in the determination of the actuarial value of assets, the actuarial value of assets increased from \$24.8 billion to about \$27.0 billion.

Based on the actuarial value, the assets of the fund returned about 10.96% which compares to the market value return of 16.25%. The difference is due to the deferral of investment gains from the current year's return under the asset smoothing method.

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

## FUNDING STATUS

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The funding status of PSRS is measured by the Funding Ratio. The Funding Ratio is the ratio of the assets available for benefits to a benefit liability measure for the System. While there are several such measures that could be appropriately used, the measure that ties most closely to your funding plan is the Actuarial Accrued Liability (“AAL”).

The PSRS actuarial accrued liability funding ratio decreased from 82.7% at June 30, 2005 to 82.6% at June 30, 2006, and increased to 83.5% as of June 30, 2007.

## GASB DISCLOSURE

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PSRS produces its accounting statements under the terms of GASB Statement Number 25. In Table 20, you will find Required Supplemental Information mandated by that statement.

## FUNDING PROCESS

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

1. The limitation on the total contribution rate (22% 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 1% of pay.

As a result, the total contribution rate for the 2009 fiscal year may not increase by more than 1% of pay over the rate for the current fiscal year.

In the 2007 session of the Legislature the unfunded actuarial accrued liabilities associated with benefit changes shall be amortized over a twenty-year period. This provision had no impact on the contribution requirements of the plan, which were already limited by the annual increase limitation of 1% of pay established in the 2003 session of the legislature.

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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>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Number	17,379	17,007	16,876	17,169	17,477
Average Age	42.7	42.6	42.5	42.3	42.2
Average Years of Service	11.7	11.7	11.6	11.5	11.3
Average Annual Salary	\$50,464	\$51,377	\$53,240	\$55,186	\$56,842
Total Payroll (000's)	\$877,009	\$873,765	\$898,481	\$947,484	\$993,422

**Female**

<b>Item</b>	<b>Actuarial Valuation as of June 30</b>				
	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Number	56,968	56,790	56,974	58,371	59,644
Average Age	42.4	42.5	42.5	42.4	42.3
Average Years of Service	11.1	11.3	11.3	11.1	11.1
Average Annual Salary	\$43,815	\$44,629	\$46,375	\$48,453	\$50,085
Total Payroll (000's)	\$2,496,049	\$2,534,465	\$2,642,168	\$2,828,267	\$2,987,276

**Total**

<b>Item</b>	<b>Actuarial Valuation as of June 30</b>				
	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Number	74,347	73,797	73,850	75,540	77,121
Average Age	42.4	42.5	42.5	42.4	42.3
Average Years of Service	11.3	11.4	11.4	11.2	11.1
Average Annual Salary	\$45,369	\$46,184	\$47,944	\$49,983	\$51,616
Total Payroll (000's)	\$3,373,058	\$3,408,230	\$3,540,649	\$3,775,752	\$3,980,698

**Table 2****Employee Distribution by Age and Years of Service  
June 30, 2007**

<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>	
20-24	1,658	0	0	0	0	0	0	1,658
25-29	8,369	2,113	0	0	0	0	0	10,482
30-34	3,524	6,159	1,262	0	0	0	0	10,945
35-39	2,396	3,082	4,385	776	0	0	0	10,639
40-44	1,796	2,141	2,021	2,608	770	1	0	9,337
45-49	1,581	1,904	1,814	1,575	2,378	952	3	10,207
50-54	1,104	1,658	1,844	1,629	1,486	2,324	911	10,956
55-59	906	1,176	1,460	1,530	1,472	989	1,158	8,691
60-64	389	535	604	594	579	350	412	3,463
65 & Over	99	124	101	106	124	83	106	743
<b>Total</b>	<b>21,822</b>	<b>18,892</b>	<b>13,491</b>	<b>8,818</b>	<b>6,809</b>	<b>4,699</b>	<b>2,590</b>	<b>77,121</b>

**Table 3****Salary Distribution  
Employees in Active Service  
on June 30, 2007**

<b>Annual Salary</b>	<b>Number</b>	<b>Percent</b>
Under \$20,000	1,616	2.1%
\$20,000-24,499	904	1.2%
\$25,000-29,999	1,554	2.0%
\$30,000-34,999	5,077	6.6%
\$35,000-39,999	9,988	12.9%
\$40,000-44,999	12,315	16.0%
\$45,000-49,999	11,182	14.5%
\$50,000-54,999	9,159	11.9%
\$55,000-59,999	6,763	8.8%
\$60,000-64,999	4,955	6.4%
\$65,000-69,999	3,660	4.7%
\$70,000-74,999	3,007	3.9%
\$75,000-79,999	2,116	2.7%
\$80,000 & Over	<u>4,825</u>	<u>6.3%</u>
Total	77,121	100.0%

**Table 4**

**Salary Increase Rates by Service Group  
Employees in Both 2006 & 2007 Actuarial Valuations**

<b>Service in 2006</b>	<b>Number</b>	<b>Percent Increase In Average Salary</b>	
		<b>Expected</b>	<b>Actual</b>
1-4	17,916	8.2%	8.4%
5-9	17,923	7.0%	7.2%
10-14	12,171	5.8%	6.0%
15-19	8,505	5.0%	5.2%
20 & Over	<u>12,385</u>	<u>5.0%</u>	<u>4.7%</u>
Total	68,900	6.5%	6.6%



**Table 5****History of System's Growth  
Active and Inactive Membership**

<b><u>June 30</u></b>	<b><u>Females</u></b>	<b><u>Males</u></b>	<b><u>Inactives</u></b>	<b><u>Total</u></b>
1985	36,056	18,407	3,005	57,468
1986	36,693	18,221	3,035	57,949
1987	37,639	18,159	3,141	58,939
1988	37,911	16,117	3,537	57,565
1989	39,021	16,177	3,543	58,741
1990	39,802	16,086	3,773	59,661
1991	40,882	16,026	4,067	60,975
1992	41,853	15,858	4,335	62,046
1993	42,825	15,668	4,705	63,198
1994	44,714	15,881	5,009	65,604
1995	46,681	16,173	5,328	68,182
1996	48,184	16,440	5,894	70,518
1997	49,800	16,656	6,373	72,829
1998	51,706	17,003	6,799	75,508
1999	52,895	17,197	7,278	77,370
2000	54,439	17,267	7,739	79,445
2001	55,405	17,283	8,930	81,618
2002	56,320	17,353	9,376	83,049
2003	56,968	17,379	10,331	84,678
2004	56,790	17,007	11,674	85,471
2005	56,974	16,876	11,692	85,542
2006	58,371	17,169	11,753	87,293
2007	59,644	17,477	11,607	88,728

**Table 6**

**Pensions in Force on June 30, 2007  
by Type and Monthly Amount**

<b>Monthly Amount</b>	<b>Service</b>	<b>Disability</b>	<b>Beneficiary</b>	<b>Survivor</b>	<b>Total</b>
Less than \$500	1,024	2	110	211	1,347
\$500 - 999	1,935	59	334	400	2,728
\$1,000 - 1,499	2,576	165	426	0	3,167
\$1,500 - 1,999	3,845	212	349	0	4,406
\$2,000 - 2,499	4,954	137	302	0	5,393
\$2,500 - 2,999	5,362	64	257	0	5,683
\$3,000 - 3,499	5,114	31	167	0	5,312
\$3,500 - 3,999	4,075	7	149	0	4,231
\$4,000 - 4,499	3,011	5	70	0	3,086
\$4,500 & Over	<u>4,361</u>	<u>1</u>	<u>113</u>	<u>0</u>	<u>4,475</u>
Total	36,257	683	2,277	611	39,828

**Table 7****Pensions in Force on June 30, 2007  
by Type and Age**

<b>Age</b>	<b>Service</b>	<b>Disability</b>	<b>Beneficiary</b>	<b>Survivor</b>	<b>Total</b>
Under 55	1,539	175	154	305	2,173
55-59	6,754	146	143	18	7,061
60-64	8,469	129	239	62	8,899
65-69	6,360	69	267	54	6,750
70-74	4,478	50	337	47	4,912
75-79	3,552	53	409	53	4,067
80-84	2,287	26	362	26	2,701
85-89	1,638	18	225	27	1,908
90 & Over	<u>1,180</u>	<u>17</u>	<u>141</u>	<u>19</u>	<u>1,357</u>
Total	36,257	683	2,277	611	39,828

**Table 8**

**Cost of Living Increases to Retired Members  
June 30, 2007**

<b>Retirement In</b>	<b>First Increase Effective Date</b>	<b>First Percentage Increase</b>	<b>Total Increases Through January 2007</b>	<b>January 2008 Increase</b>	<b>Total Increases Through January 2008</b>	<b>Number of Retired Members at 06/30/2007</b>
1984 & Earlier	Jan. 1988	Various	80.00%	0.00%	80.00%	3,481
1985	Jan. 1989	4.00%	75.64%	2.48%	80.00%	548
1986	Jan. 1990	4.00%	69.11%	2.70%	73.68%	652
1987	Jan. 1991	4.00%	62.65%	2.70%	67.04%	671
1988	Jan. 1992	4.70%	56.39%	2.70%	60.61%	812
1989	Jan. 1993	3.10%	49.35%	2.70%	53.38%	717
1990	Jan. 1994	3.00%	44.88%	2.70%	48.79%	876
1991	Jan. 1995	2.50%	40.66%	2.70%	44.46%	916
1992	Jan. 1996	3.00%	37.22%	2.70%	40.92%	1,081
1993	Jan. 1997	2.80%	33.22%	2.70%	36.82%	914
1994	Jan. 1998	2.30%	29.58%	2.70%	33.08%	1,035
1995	Jan. 1999	1.70%	26.67%	2.70%	30.09%	1,238
1996	Jan. 2000	2.00%	24.54%	2.70%	27.90%	1,662
1997	Jan. 2001	3.70%	22.11%	2.70%	25.41%	1,634
1998	Jan. 2002	3.30%	17.75%	2.70%	20.93%	1,862
1999-2001 <sup>a</sup>	Jan. 2003	1.10%	14.00%	2.70%	17.08%	6,854
2002 <sup>b</sup>	Jan. 2004	2.10%	12.76%	2.70%	15.80%	2,017
2003	Jan. 2005	3.30%	10.43%	2.70%	13.41%	2,354
2004	Jan. 2006	2.50%	6.91%	2.70%	9.80%	2,609
2005	Jan. 2007	4.30%	4.30%	2.70%	7.12%	2,444
2006	Jan. 2008	2.70%		2.70%	2.70%	2,380
2007						183
<b>Total</b>						<b>36,940</b>

<sup>a</sup> Includes all retirements in 1999, and, because of legislation in 2000 and 2001, all persons retiring after June 30 of each of those years.

<sup>b</sup> Includes all retirements in 2002 and, because of legislation in 2000 and 2001, all persons retiring before July 1 of each of those years.

**Table 9**

**Analysis of Retired Membership by Type of Benefit**  
**(Dollar Amounts in Millions)**  
**June 30, 2007**

<b>Type of Benefit</b>	<b>Number</b>	<b>Annual Benefit</b>	<b>Total Liability</b>
Service Retirees			
Options 1 & 10 (Life Only)	18,553	608.1	7,125.9
Options 2 & 21 (100% J&S with Pop-Up)	9,803	364.7	5,222.6
Option 3 & 31 (75% J&S with Pop-Up)	1,824	75.1	1,087.8
Option 4 & 41(50% J&S with Pop-Up)	3,727	142.8	1,884.6
Option 5 (10 Years Certain & Life)	776	29.1	399.0
Option 6 (5 Years Certain & Life)	178	6.4	86.4
Option 20 (100% J & S)	962	31.7	328.9
Option 30 (75% J & S)	24	1.2	15.1
Option 40 (50% J & S)	<u>410</u>	<u>12.5</u>	<u>97.4</u>
 Total	 36,257	 \$1,271.6	 \$16,247.7
 Disability Retirees	 683	 \$15.1	 \$140.8
 Beneficiaries of Retiree Deaths	 2,277	 \$57.7	 \$567.9
 Survivors of Active Deaths	 611	 \$5.4	 \$28.6

Note: Excludes retirees returned to teaching and additional deposit annuities.

**Table 10****History of System's Growth  
Service Retired**

<b>June 30</b>	<b>Females</b>	<b>Males</b>	<b>Total Retired</b>	<b>Total Monthly Pensions</b>	<b>Average Monthly Pension</b>	<b>Average New Pension Granted</b>
1985	11,307	3,227	14,534	\$8,153,600	\$561.00	\$900 Mo.
1986	11,488	3,476	14,964	9,026,630	603.22	994
1987	11,684	3,810	15,494	10,099,084	651.81	1,123
1988	11,857	4,054	15,911	11,202,662	704.08	1,191
1989	12,117	4,345	16,462	12,412,178	753.99	1,142
1990	12,288	4,591	16,879	13,926,237	825.06	1,338
1991	12,500	4,883	17,383	15,535,235	893.70	1,442
1992	12,695	5,208	17,903	17,748,286	991.36	1,555
1993	13,071	5,547	18,618	19,647,453	1,055.29	1,549
1994	13,166	5,797	18,963	21,564,088	1,137.17	1,673
1995	13,343	6,081	19,424	23,563,044	1,213.09	1,898
1996	13,658	6,417	20,275	27,698,314	1,379.74	2,007
1997	14,716	6,424	21,140	31,431,017	1,486.80	2,005
1998	14,805	7,364	22,169	37,876,023	1,708.51	2,300
1999	15,551	7,835	23,386	45,132,257	1,929.88	2,488
2000	16,360	8,399	24,759	51,928,849	2,097.37	2,684
2001	17,584	9,055	26,639	61,434,862	2,306.20	2,775
2002	18,598	9,530	28,128	67,894,473	2,413.77	2,835
2003	19,440	9,983	29,423	73,017,878	2,481.66	2,846
2004	20,592	10,460	31,052	80,173,849	2,581.92	2,973
2005	22,056	10,945	33,001	88,978,551	2,696.24	2,919
2006	23,302	11,329	34,631	96,626,872	2,790.18	2,946
2007	24,534	11,723	36,257	105,963,764	2,922.57	2,995

Notes: Excludes retirees returned to teaching. Counts and amounts reported as being paid at valuation date, including options.

**Table 11****History of System's Growth  
Disability Retired**

<b>June 30</b>	<b>Females</b>	<b>Males</b>	<b>Total Retired</b>	<b>Total Monthly Pensions</b>	<b>Average Monthly Pension</b>	<b>Average New Pension Granted</b>
1985	406	143	549	\$291,619	\$531.18	\$834 Mo.
1986	412	139	551	309,378	561.48	916
1987	413	143	556	323,649	582.10	884
1988	400	142	542	339,710	626.77	1,096
1989	394	149	543	362,423	667.45	1,088
1990	396	156	552	394,564	714.79	1,061
1991	402	153	555	420,031	756.81	1,257
1992	391	154	545	449,376	824.54	1,144
1993	400	160	560	484,265	864.76	1,178
1994	392	164	556	511,353	919.70	1,281
1995	395	163	558	533,106	955.39	1,377
1996	407	160	567	605,823	1,068.47	1,424
1997	413	153	566	626,626	1,107.11	1,366
1998	413	148	561	695,710	1,240.12	1,483
1999	424	145	569	776,500	1,364.67	1,740
2000	439	141	580	837,745	1,444.39	1,550
2001	456	140	596	929,492	1,559.55	1,728
2002	461	136	597	965,816	1,617.78	1,846
2003	466	138	604	987,727	1,635.31	1,672
2004	489	141	630	1,062,279	1,686.16	1,849
2005	517	147	664	1,151,931	1,734.84	1,690
2006	527	144	671	1,197,398	1,784.50	2,189
2007	539	144	683	1,259,273	1,843.74	1,704

Notes: Excludes retirees returned to teaching. Counts and amounts reported as being paid at valuation date, including options.

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

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**Table 12****Market Value of Assets  
Balance Sheet**

	<b>June 30, 2006</b>	<b>June 30, 2007</b>
<b>Assets:</b>		
Cash	\$ 45,707,391	\$ 106,295,998
Contribution Receivable	140,577,696	143,661,005
Accrued Interest and Dividends	88,574,543	282,353,748
Investments	25,824,074,259	29,373,854,626
Trades Pending	2,812,218,210	4,489,593,527
Other Assets	280,659	221,512
Capital Assets	11,850,531	12,764,716
Due from NTRS	691,452	497,409
Total	<u>\$ 28,923,974,741</u>	<u>\$ 34,409,242,541</u>
<b>Liabilities:</b>		
Accounts Payable	\$ 20,420,200	\$ 20,814,041
Employer-Pay Liability	501,417	565,851
Interest Payable	5,473,445	11,874,726
Trades Pending	3,294,051,028	5,092,321,102
Other Liabilities	-	-
Total	<u>\$ 3,320,446,090</u>	<u>\$ 5,125,575,720</u>
<b>Net Assets</b>	<b>\$ 25,603,528,651</b>	<b>\$ 29,283,666,821</b>

**Table 13**

**Statement of Revenue and Expenses  
Market Value Reconciliation For Fiscal Year Ended June 30, 2007**

<b>Operating Revenues</b>	<b>Amount</b>
<i>Contributions:</i>	
Employers	\$ 472,216,630
Members	<u>514,163,373</u>
Total Contributions	986,380,003
<i>Net Investment Income:</i>	
Interest	425,083,692
Dividends	279,450,091
Net Income from Security Lending Activities	<u>12,631,290</u>
Total Investment Income	717,165,073
Net Capital Appreciation (Depreciation)	3,474,334,796
Less: Investment Expenses	<u>(66,336,071)</u>
Total Investment Return	4,125,163,798
<i>Other Income</i>	<u>280,532</u>
Total Operating Revenues	<u><u>5,111,824,333</u></u>
<b>Operating Expenses</b>	
Benefit Payments	1,380,562,964
Refunds to Members	44,010,291
Administrative Expenses	7,111,060
Other Expense	<u>1,848</u>
Total Operating Expenses	<u><u>1,431,686,163</u></u>
<b>Excess of Revenues over Expenses</b>	3,680,138,170
<b>Fund Balance, June 30, 2006</b>	<u>25,603,528,651</u>
<b>Fund Balance, June 30, 2007</b>	<u><u>29,283,666,821</u></u>

**Table 14**

**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	264,224	(150,138)	(2,120)	(152,258)	111,966	1,429,429	10.7
1988	293,698	(266,431)	(2,377)	(268,808)	24,890	1,446,485	18.6
1989	309,266	(180,012)	(3,357)	(183,369)	125,897	1,556,775	11.8
1990	328,173	(215,429)	(3,850)	(219,279)	108,894	1,652,719	13.3
1991	345,827	(229,330)	(4,800)	(234,130)	111,697	1,750,191	13.4
1992	359,208	(245,365)	(5,583)	(250,948)	108,260	1,809,458	13.9
1993	370,317	(270,529)	(6,556)	(277,085)	93,232	1,867,948	14.8
1994	397,622	(290,636)	(7,623)	(298,259)	99,363	1,996,908	14.9
1995	433,990	(320,343)	(9,760)	(330,103)	103,887	2,137,134	15.4
1996	488,484	(372,954)	(12,468)	(385,422)	103,062	2,283,994	16.9
1997	516,694	(426,029)	(3,867)	(429,896)	86,798	2,427,429	17.7
1998	562,350	(471,259)	(2,827)	(474,086)	88,264	2,577,594	18.4
1999	589,882	(565,662)	(3,141)	(568,803)	21,079	2,690,007	21.1
2000	624,524	(675,079)	(3,712)	(678,791)	(54,267)	2,836,065	23.9
2001	658,801	(784,938)	(4,009)	(788,947)	(130,146)	2,982,051	26.5
2002	696,685	(892,214)	(4,486)	(896,700)	(200,015)	3,213,461	27.9
2003	734,413	(958,924)	(4,676)	(963,600)	(229,187)	3,373,058	28.6
2004	765,377	(1,060,758)	(5,274)	(1,066,032)	(300,655)	3,408,230	31.3
2005	821,916	(1,186,924)	(5,614)	(1,192,538)	(370,622)	3,540,649	33.7
2006	932,559	(1,297,233)	(6,754)	(1,303,987)	(371,428)	3,775,752	34.5
2007	986,380	(1,424,573)	(7,113)	(1,431,686)	(445,306)	3,980,698	36.0

**Table 15****Development of the Actuarial Value of Assets**

1. Valuation Assets June 30, 2006		\$ 24,801,644,465
2. Activity for FY 2007		
a. Contributions	\$ 986,380,003	
b. Benefits and Expenses	<u>(1,431,686,162)</u>	
c. Net Cash Flow	(445,306,159)	
3. Expected Returns	1,966,661,981	
4. Assets Before Allocation of G/L (1+2+3)		26,323,000,287
5. Actual Returns for 2007	4,125,444,330	
6. Excess Returns for 2007 (5-3)	2,158,782,349	
7. Recognized Excess Returns		
2007	431,756,470	
2006	81,343,215	
2005	50,702,395	
2004	162,202,071	
2003	-	
Total		<u>726,004,151</u>
8. Actuarial Value of Assets June 30, 2007		\$ 27,049,004,438

**Table 16****History of System's Reserve Funds**

<b>June 30</b>	<b>Accumulated Employee Contributions</b>	<b>General Reserves Contributed by Employers</b>	<b>Total Funds</b>
1985	\$1,074,474,872	\$1,779,172,019	\$2,853,646,891
1986	1,199,080,656	2,073,456,154	3,272,536,810
1987	1,333,786,497	2,415,732,721	3,749,519,218
1988	1,427,755,173	2,745,290,213	4,173,045,386
1989	1,605,331,167	3,164,741,308	4,770,072,475
1990	1,780,289,109	3,625,499,691	5,405,788,800
1991	1,983,630,527	4,095,234,736	6,078,865,263
1992	2,191,277,064	4,663,290,911	6,854,567,975
1993	2,384,406,117	5,378,325,303	7,762,731,420
1994	2,616,067,465	6,561,002,730	9,177,070,195
1995	2,856,389,033	7,336,694,489	10,193,083,522
1996	3,098,447,617	8,412,177,685	11,510,625,302
1997	3,312,090,156	9,787,128,615	13,099,218,771
1998	3,541,459,187	11,437,899,111	14,979,358,298
1999	3,765,853,678	13,444,016,205	17,209,869,883
2000	3,976,059,124	15,461,163,652	19,437,222,776
2001	4,129,190,609	17,017,103,699	21,146,294,308
2002	4,354,506,588	17,881,598,628	22,236,105,216
2003	4,687,227,277	15,360,754,260	20,047,981,537
2004	4,954,079,813	16,547,491,808	21,501,571,620
2005	5,119,054,776	17,930,385,726	23,049,440,502
2006	5,453,906,342	19,347,738,123	24,801,644,465
2007	5,820,742,526	21,228,261,912	27,049,004,438

Book Value prior to 1994, five-year average of adjusted market values after 1993.

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

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**Table 17****Ten Year Historical Summary  
(All Dollar Figures in Thousands)**

	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Active Members	68,709	70,092	71,706	72,688	73,673	74,347	73,797	73,850	75,540	77,121
Retired Members	23,955	25,339	27,238	29,234	30,865	32,249	34,230	36,321	38,110	39,828
Actuarial Assets	\$14,979,358	\$17,209,870	\$19,437,223	\$21,146,294	\$22,236,105	\$20,047,982	\$21,501,572	\$23,049,441	\$24,801,644	\$27,049,004
UAAL	(\$508,309)	(\$836,726)	(\$1,158,110)	\$135,909	\$1,097,832	\$4,671,468	\$4,723,688	\$4,832,072	\$5,235,486	\$5,347,718
Benefit Payments And Refunds	(\$474,087)	(\$568,803)	(\$675,079)	(\$784,938)	(\$892,214)	(\$958,924)	(\$1,060,758)	(\$1,186,924)	(\$1,297,233)	(\$1,424,573)
Accumulated Members' Contributions	\$3,541,459	\$3,765,854	\$3,976,059	\$4,129,191	\$4,354,507	\$4,687,227	\$4,954,080	\$5,119,055	\$5,453,906	\$5,787,667
APV of Retirees' Benefits	\$5,523,768	\$6,603,148	\$7,801,845	\$9,504,921	\$10,589,546	\$11,387,543	\$12,625,925	\$13,976,901	\$15,371,279	\$17,059,613

**Table 18**

**Determination of Normal Cost  
June 30, 2007  
For the 2007 - 2008 Plan Year**

	<u>Dollar</u>	<u>Rate<sup>1</sup></u>
<b>Active Members</b>		
Retirement Benefits	\$762,627,352	19.50%
Termination Benefits	64,259,175	1.65%
Death Benefits	9,119,443	0.23%
Disability Benefits	8,572,120	0.22%
<b>Total Normal Cost</b>	\$844,578,090	21.60%
<b>Estimated Employee Contributions</b>	488,853,740	
<b>Employer Normal Cost</b> (Total Normal Cost less Employee Contributions)	\$355,724,350	

<sup>1</sup> Normal cost rate was determined using an expected payroll of \$3,910,829,924.



**Table 19**

**Determination of the Unfunded Actuarial Accrued Liability  
June 30, 2007**

**Actives Members:**

Service Retirement	\$14,907,976,005
Death Benefits	92,972,177
Disability Benefits	70,037,665
Termination Benefits	(143,887,676)
Inactives	410,011,270
Total for Active and Inactives Members	\$15,337,109,441

**Pay Status Members:**

Service Retirees	\$16,267,015,558
Disability Retirees	140,766,782
Survivors	596,473,255
Tax-sheltered Annuitants	1,016,588
Death Benefit	54,341,306
Total for Pay Status Members	\$17,059,613,489

Total Actuarial Accrued Liability \$32,396,722,930

Actuarial Value of Assets \$27,049,004,438

**Total Unfunded Actuarial Accrued Liability \$5,347,718,492**

**Table 20**

**Schedule of Funding Progress  
(\$ in Thousands)**

Actuarial Valuation Date	Value of Assets (a)	Actuarial Accrued			Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (b-a)/c
		Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)		
06/30/1998	\$14,979,358	\$ 14,471,049	\$ (508,309)	103.5%	\$2,577,594	-19.7%
06/30/1999	17,209,870	16,373,144	(836,726)	105.1%	2,690,007	-31.1%
06/30/2000	19,437,223	18,279,113	(1,158,110)	106.3%	2,836,062	-40.8%
06/30/2001	21,146,294	21,282,203	135,909	99.4%	2,982,051	4.6%
06/30/2002	22,236,105	23,333,937	1,097,832	95.3%	3,213,461	34.2%
06/30/2003	20,047,982	24,719,450	4,671,468	81.1%	3,373,058	138.5%
06/30/2004	21,501,572	26,225,259	4,723,687	82.0%	3,408,230	138.6%
06/30/2005	23,049,441	27,881,513	4,832,072	82.7%	3,540,649	136.5%
06/30/2006	24,801,644	30,037,130	5,235,486	82.6%	3,775,752	138.7%
06/30/2007	27,049,004	32,396,723	5,347,719	83.5%	3,980,698	134.3%

**Schedule of Employer Contributions**

Actuarial Valuation Date	Annual Required Contribution <sup>1</sup>	Employer Contribution	Percentage Contributed
06/30/1998	\$ 273,125,719	\$ 273,125,719	100.0%
06/30/1999	287,698,736	287,698,736	100.0%
06/30/2000	304,944,352	304,944,352	100.0%
06/30/2001	324,525,673	324,525,673	100.0%
06/30/2002	340,000,556	340,000,556	100.0%
06/30/2003	376,659,713	355,979,027	94.5%
06/30/2004	475,400,520	359,762,556	75.7%
06/30/2005	593,328,374	389,415,997	65.6%
06/30/2006	608,134,319	429,578,911	70.6%
06/30/2007	644,969,214	472,216,630	73.2%

<sup>1</sup> Annual Required Contribution determined by applying the 30-year contribution rate, net of the employee contribution rate, to the estimated payroll on which contributions were made. This payroll is determined using the employer contribution over the statutory employer contribution rate.

**Notes in Trend Data**

**Information:**

Valuation Date  
Actuarial Cost Method  
Amortization Method  
Remaining Amortization Period  
Asset Valuation Method

**Data**

06/30/2007  
Entry Age Normal  
Level Percent, Open  
30  
5-Year Smoothed Market  
Marked to Market as of June 30, 2003

**Actuarial**

Investment rate of return 8.0%  
Projected salary increases 5.0% - 10.25%  
Cost-of-living adjustments 3.25%

**Table 21**

**Calculation of Unfunded Actuarial Accrued Liability  
June 30, 2007**

	<u>Amount</u>
(1) Present Value of Future Benefits for:	
Active Members	\$23,177,934,589
Service Retirees	16,267,015,558
Disability Retirees	140,766,782
Tax-sheltered Annuitants	1,016,588
Survivors	596,473,255
Death Benefits	54,341,306
Inactive Members	410,011,270
Total	<u>40,647,559,348</u>
(2) Present Value of Future Normal Costs	8,250,836,418
(3) Actuarial Accrued Liability ((1)-(2))	32,396,722,930
(4) Actuarial Value of Assets	27,049,004,438
(5) Unfunded Actuarial Accrued Liability ((3)-(4))	\$5,347,718,492

**Required Contribution Rate & Amortization of Unfunded Liability  
for the Fiscal Year Ending 2008**

	<u>Percentage of Payroll</u>
(1) Total Contribution Rate, Member + Employer	25.00%
(2) Normal Cost Rate <sup>1</sup>	21.60%
(3) Approximate Rate Available for Unfunded Actuarial Accrued Liability ((1)-(2))	3.40%
(4) Benchmark Contribution Rate - Normal Cost Plus a Rate to fund UAAL over 30 Years <sup>2</sup>	28.24%

<sup>1</sup> Normal cost rate was determined using an expected payroll of \$3,910,829,924.

<sup>2</sup> Contribution rate to amortize the UAAL was determined using valuation payroll of \$3,980,698,443. The benchmark contribution shown here has been adjusted for the 20 year amortization of unfunded liabilities due to changes in benefit provisions as amended in the 2007 legislative session.

**Table 22****Analysis of Actuarial Gains and Losses  
(\$ in 000's)**

	<u>Amount</u>
1. Unfunded Actuarial Liability as of June 30, 2006	\$ 5,235,486
2. Normal Cost for 2007 Plan Year	799,550
3. Contribution Expected to be Received During Year (30-Year Rate)	(1,117,311)
4. Interest to Year End @ 8.00% on 1., 2., and 3.	406,373
5. Expected Unfunded Actuarial Liability as of June 30, 2007	5,324,099
6. Contribution Shortfall <sup>1</sup>	183,675
7. Valuation Refinements	328,084
8. Actuarial (Gain)/Loss During the Year	
a. From Investment	(726,004)
b. From Actuarial Liabilities Due to Actual vs. Expected COLA	149,549
c. From Unfunded Actuarial Liabilities Due to Reinstated Service	22,733
d. From Unfunded Actuarial Liabilities Due to Other Purchased Service	15,610
e. From Actuarial Liabilities Due to Legislative Changes	32,883
f. From Actuarial Liabilities Due to Unexpected Salary Changes	(41,357)
g. From Actuarial Liabilities Due to Demographic Experience	63,391 <sup>2</sup>
h. From Actuarial Liabilities Due to Other	(4,945)
i. Total	<u>(\$488,140)</u>
9. Actual Unfunded Actuarial Liability as of June 30, 2007	\$5,347,718

<sup>1</sup>Excludes employee contributions for purchased or reinstated service.

<sup>2</sup>Includes approximately \$103 million for new active members.

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

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**Table 23****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>
06/30/1992	57,711	1,809,458	31,354	1.9%	42.2	12.2
06/30/1993	58,493	1,867,948	31,935	1.9%	42.3	12.3
06/30/1994	60,595	1,996,908	32,955	3.2%	42.5	12.3
06/30/1995	62,854	2,137,134	34,002	3.2%	42.5	12.3
06/30/1996	64,624	2,283,994	35,343	3.9%	42.6	12.3
06/30/1997	66,456	2,427,429	36,527	3.3%	42.5	12.1
06/30/1998	68,709	2,577,594	37,514	2.7%	42.5	11.9
06/30/1999	70,092	2,690,353	38,383	2.3%	42.5	11.7
06/30/2000	71,706	2,836,062	39,581	3.1%	42.5	11.6
06/30/2001	72,688	2,982,051	41,025	3.7%	42.4	11.3
06/30/2002	73,673	3,213,461	43,618	6.3%	42.3	11.2
06/30/2003	74,347	3,373,058	45,369	4.0%	42.4	11.3
06/30/2004	73,797	3,408,230	46,184	1.8%	42.5	11.4
06/30/2005	73,850	3,540,649	47,944	3.8%	42.5	11.4
06/30/2006	75,540	3,775,752	49,983	4.3%	42.4	11.2
06/30/2007	77,121	3,980,698	51,616	3.3%	42.3	11.1

**Table 24**

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

Actuarial Valuation Date	Actuarial Accrued Liability				Percentage of Actuarial Liabilities Covered by Net Assets for:		
	Member Contributions	Current Retirees & Beneficiaries	Active & Inactive Members Employer Financed Portion	Net Assets Available for Benefits	(1)	(2)	(3)
	(1)	(2)	(3)				
06/30/1994	2,616,067	3,206,061	4,147,631	9,177,070	100.0%	100.0%	80.9%
06/30/1995	2,856,389	3,705,807	4,419,626	10,193,084	100.0%	100.0%	82.2%
06/30/1996	3,098,448	4,265,851	4,867,447	11,510,625	100.0%	100.0%	85.2%
06/30/1997	3,312,090	4,553,628	4,583,460	13,099,219	100.0%	100.0%	114.2%
06/30/1998	3,541,459	5,523,768	5,405,822	14,979,358	100.0%	100.0%	109.4%
06/30/1999	3,765,854	6,602,915	5,305,210	17,209,870	100.0%	100.0%	129.0%
06/30/2000	3,976,059	7,801,845	6,501,209	19,437,223	100.0%	100.0%	117.8%
06/30/2001	4,129,191	9,504,921	7,648,091	21,146,294	100.0%	100.0%	98.2%
06/30/2002	4,354,507	10,589,546	8,389,885	22,236,105	100.0%	100.0%	86.9%
06/30/2003	4,687,227	11,387,543	8,644,680	20,047,982	100.0%	100.0%	46.0%
06/30/2004	4,954,080	12,625,925	8,645,254	21,501,572	100.0%	100.0%	45.4%
06/30/2005	5,119,055	13,976,901	8,785,557	23,049,441	100.0%	100.0%	45.0%
06/30/2006	5,453,906	15,371,279	9,211,945	24,801,644	100.0%	100.0%	43.2%
06/30/2007	5,787,667	17,059,613	9,549,443	27,049,004	100.0%	100.0%	44.0%

**Table 25**

**Schedule of Retirees and Beneficiaries Added to  
and Removed From Retirement Rolls**

<b>Actuarial Valuation Date</b>	<b>Service Retirees</b>			<b>Disability Retirees</b>			<b>Beneficiaries</b>		
	<b>Added to Rolls</b>	<b>Removed from Rolls</b>	<b>Rolls End of Year</b>	<b>Added to Rolls</b>	<b>Removed from Rolls</b>	<b>Rolls End of Year</b>	<b>Added to Rolls</b>	<b>Removed from Rolls</b>	<b>Rolls End of Year</b>
06/30/1991	1,067	563	17,383	28	25	555	N/A	N/A	N/A
06/30/1992	1,119	599	17,903	33	43	545	N/A	N/A	N/A
06/30/1993	1,269	554	18,618	45	30	560	110	63	1,259
06/30/1994	1,021	676	18,963	35	39	556	130	63	1,326
06/30/1995	1,141	680	19,424	34	32	558	152	66	1,412
06/30/1996	1,344	693	20,075	44	35	567	150	72	1,490
06/30/1997	1,797	732	21,140	30	31	566	170	74	1,586
06/30/1998	1,757	728	22,169	27	32	561	187	82	1,691
06/30/1999	1,965	748	23,386	41	33	569	182	82	1,791
06/30/2000	2,136	763	24,759	43	32	580	187	79	1,899
06/30/2001	2,639	759	26,639	45	29	596	189	89	1,999
06/30/2002	2,262	773	28,128	42	41	597	248	107	2,140
06/30/2003	2,078	783	29,423	37	30	604	197	115	2,222
06/30/2004	2,458	829	31,052	54	28	630	482	156	2,548
06/30/2005	2,639	690	33,001	59	25	664	236	128	2,656
06/30/2006	2,441	811	34,631	41	34	671	279	127	2,808
06/30/2007	2,396	770	36,257	41	29	683	241	161	2,888



**Table 26**

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

<b>Actuarial Valuation Date</b>	<b>Service Retirees</b>		<b>Disability</b>		<b>Beneficiaries</b>	
	<b>Number</b>	<b>Benefits</b>	<b>Number</b>	<b>Benefits</b>	<b>Number</b>	<b>Benefits</b>
06/30/1993	18,618	234,933	560	5,826	1,303	9,299
06/30/1994	18,963	254,957	556	6,102	1,372	10,373
06/30/1995	19,424	281,897	558	6,427	1,412	11,821
06/30/1996	20,075	329,115	567	7,180	1,490	13,403
06/30/1997	21,140	377,172	566	7,520	1,586	15,874
06/30/1998	22,169	454,512	561	8,349	1,691	20,048
06/30/1999	23,386	542,071	569	9,338	1,793	29,625
06/30/2000	24,759	623,827	580	10,088	1,899	30,843
06/30/2001	26,639	737,218	596	11,154	1,999	36,769
06/30/2002	28,128	737,218	597	11,590	2,140	40,743
06/30/2003	29,423	876,196	604	11,853	2,222	43,449
06/30/2004	31,052	962,086	630	12,747	2,548	48,846
06/30/2005	33,001	1,067,743	664	13,823	2,656	54,186
06/30/2006	34,631	1,159,522	671	14,369	2,808	58,240
06/30/2007	36,257	1,271,565	683	15,111	2,888	63,065

**Average New Retiree Statistics**

<b>Actuarial Valuation Date</b>	<b>Regular Retirement Benefit</b>	<b>% Increase From Previous Year</b>	<b>Age</b>	<b>Creditable Service</b>
06/30/1993	1,854.29	8	59.0	26.8
06/30/1994	2,096.35	13	58.8	27.8
06/30/1995	2,013.36	(4)	58.7	26.8
06/30/1996	2,182.88	8	56.3	27.8
06/30/1997	2,005.00	(8)	56.4	N/A
06/30/1998	2,300.19	15	57.1	N/A
06/30/1999	2,488.36	8	57.0	N/A
06/30/2000	2,683.72	8	57.0	25.6
06/30/2001	2,775.17	3	56.7	26.5
06/30/2002	2,834.93	2	56.6	26.5
06/30/2003	2,845.98	0	56.8	26.0
06/30/2004	2,973.46	4	56.8	26.2
06/30/2005	2,919.10	(2)	58.0	25.7
06/30/2006	2,945.79	1	58.3	25.4
06/30/2007	2,994.71	2	58.4	25.4

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## **APPENDIX E**

### **ACTUARIAL METHODS AND ASSUMPTIONS**

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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 this statement of its 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 not been adjusted for the 20 year amortization of unfunded liabilities due to changes in benefit provisions as amended in the 2007 legislative session. This amendment had no impact on the final contribution rates, which were limited by the annual increase limitation of 1% of pay established in the 2003 session of the legislature
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 using adjusted market values averaged 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.

**ACTUARIAL ASSUMPTIONS**  
**(ADOPTED FOR USE WITH THE JUNE 30, 2006, VALUATION)**

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**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).

**Salary and Payroll Increases**

Salaries are assumed to increase each year at the rate of 5%. Longevity adjustments are made for those with less than 15 years of service, as follows:

<u>Service</u>	<u>Longevity Adjustment</u>	<u>Total Increase</u>
0	5.25%	10.25%
1	4.25	9.25
2	2.75	7.75
3	2.75	7.75
4	2.75	7.75
5	2.50	7.50
6	2.25	7.25
7	2.00	7.00
8	1.75	6.75
9	1.50	6.50
10	1.25	6.25
11	1.00	6.00
12	0.75	5.75
13	0.50	5.50
14	0.25	5.25
15 & Over	0.00	5.00

Total covered payroll of the entire membership is assumed to increase 5.0% per year in the future.

## Mortality Rates

Mortality Rates for non-disabled retirees are based on the 1994 Group Annuity Mortality Table with male ages set back three years and female ages set back three years. Mortality for active members are based on the following percentages of retiree mortality:

Male	70%
Female	65%

Illustrative rates per 1,000 members at various ages are as follows:

### Service Retired Members, Beneficiaries and Survivors

<u>Age</u>	<u>Male</u>	<u>Female</u>
20	0.430	0.262
30	0.727	0.302
40	0.891	0.551
50	1.899	1.112
60	5.581	2.919
70	18.034	10.764
80	45.171	28.366
90	115.671	84.023
100	268.815	219.655
110	441.935	424.846

### Disability Retirees, Male and Female

<u>Age</u>	<u>Rate</u>
40	24.075
50	26.175
60	31.500
70	44.625
80	76.650
90	173.276
100	507.128

## Withdrawal Rates

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

<b>Years of Service</b>	<b>Rate</b>
0	190.0
1	105.0
2	85.0
3	73.0
4	62.0
5	52.0
10	23.0
15	12.0
20	5.0

It is assumed that 70% of those leaving after earning 5 years of service leave their contributions in the fund and receive a vested benefit.

## Disability Rates

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

<b>Age</b>	<b>Rates</b>
30	0.090
35	0.130
40	0.280
45	0.505
50	0.780
55	1.535

## Retirement Rates

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

Age	Service							
	<25 <sup>2</sup>	25	26	27	28	29	30	31+
<50 <sup>1</sup>		40	40	40	40	40	350	300
50 <sup>1</sup>		40	40	40	40	40	490	300
51 <sup>1</sup>		40	40	40	40	490	350	300
52 <sup>1</sup>		40	40	40	490	240	350	300
53 <sup>1</sup>		40	40	490	240	240	350	300
54 <sup>1</sup>		40	490	240	240	240	350	300
55	25	450	200	200	200	200	350	300
56	25	200	200	200	200	200	350	300
57	25	200	200	200	200	200	350	300
58	25	200	200	200	200	200	350	300
59	25	200	200	200	200	200	350	300
60	200	200	200	200	200	200	350	300
61	200	200	200	200	200	200	350	300
62	200	200	200	200	200	200	350	300
63	200	200	200	200	200	200	350	300
64	200	200	200	200	200	200	350	300
65	300	300	300	300	300	300	350	300
66	200	200	200	200	200	200	350	300
67	200	200	200	200	200	200	350	300
68	200	200	200	200	200	200	350	300
69	200	200	200	200	200	200	350	300
70+	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

<sup>1</sup> Rates for members with less than 30 years of service and not eligible for the Rule of 80 are applicable from 1999-2013.

<sup>2</sup> Rates for members who are younger than 60 are for early (age reduced) retirement.

Rates for participants whose service is less than 25 who meet the Rule of 80 are 45 percent in the first year of eligibility and 20 percent thereafter.

## **Interest on Member Accounts**

6% per year

## **Service Purchases**

Incremental service credits attributable to the purchase of service are not valued until all payments for the purchase of service have been made.

## **Rehire Liability**

Inactive member liability is carried until a series of five one-year breaks in service.

## **Cost of Living Adjustments**

The cost of living adjustment assumed in the valuation is 3.25% per year, and 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, nor 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.

## **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% 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.

## **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% per annum.

## **Beneficiaries**

The percentage of males and females that are assumed to be married or to have eligible dependent beneficiaries varies by age and sex. The following are illustrative of the percentages used:

<u>Age</u>	<u>Male</u>	<u>Female</u>
20	40%	60%
30	84	87
40	87	86
50	85	84
60	79	81



Beneficiaries are assumed to be of the opposite sex from the member. Female beneficiaries are assumed to be 3 years younger than the member, and male beneficiaries are assumed to be 3 years older than the member.

### **Survivor Benefits**

In the active member valuation, dependent based survivor benefits for children are estimated using an approximation of \$165,000 for members under age 40.

Benefits for current dependent children are assumed to cease at age 22 if currently under age 22. Current dependent children older than 22 are assumed to continue receiving benefits until death.

### **Terminations**

Thirty percent (30%) of all active members who terminate for reasons other than death, disability or retirement are assumed to take of refund of their member account balance. The other seventy percent (70%) are expected to elect a termination benefit deferred to age 60. The same approach is used to value vested, inactive members.

If the present value of the deferred benefit is less than the member account balance, the value of the member account balance is valued.

### **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.

### **Missing/Incomplete Data**

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 \$10,000.

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## **APPENDIX F**

### **SUMMARY OF BENEFIT PROVISIONS OF PSRS**

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## **MEMBER CONTRIBUTIONS**

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Half the total PSRS contribution rate. The current total PSRS contribution rate is 25% of pay and may increase 1% each year.

## **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**

2.5% of Final Average Salary for each year of Membership Service. Members retiring before July 1, 2013 with at least 31 years of service will receive a benefit based on 2.55%. A year of Prior Service is the equivalent of 0.6 year of Membership Service.

### **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 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.

### **PRIOR SERVICE**

Service in a covered position prior to July 1, 1946.

### **CREDITABLE SERVICE**

Membership service plus any service rendered prior to PSRS inception.

### **NORMAL FORM OF BENEFIT**

Single Life Annuity

Additional 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**

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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.

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

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### **ELIGIBILITY**

Retirement on or before July 1, 2013 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:

<b>Years of Service</b>	<b>Benefit Percentage</b>
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

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In any year in which the Board determines that the CPI has increased, the Board may provide for annual increases in the current benefit of up to 5%. 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.

## DISABILITY BENEFITS

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### DEFINITION OF DISABILITY

Incapacitation 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 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

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### 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**

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### **REFUND**

Refund of accumulated member contributions with interest

### **DEPENDENT BASED SURVIVOR BENEFITS**

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:

1. Spouse who was married to the deceased member for at least three years and with no dependent children – up to \$860 / month payable after spouse age 60 (immediately if spouse is disabled) and prior to remarriage.
2. Spouse with dependent children
  - a. Up to \$860 per month payable to spouse with at least one dependent child under age 18.
  - 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.
  - c. Family maximum - \$2,160 per month.
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 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 retirees are provided on these benefits.