

February 27, 2015

#### **CONFIDENTIAL**

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

**Re:** House Bill No. 770 (HB 770)

Dear Judy:

Enclosed are the results of a supplemental actuarial valuation related to a proposed benefit change for the Missouri State Employees' Retirement System June 30, 2014 valuation.

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

Respectfully submitted,

David Tousek

Blad Cee a for

Brad Lee Armstrong, ASA, EA, FCA, MAAA

David T. Kausch, FSA, EA, FCA, MAAA

BLA/DTK:ah Enclosure

**REQUESTED BY:** Mr. Gary W. Findlay, Executive Director

SUBMITTED BY: Brad Lee Armstrong, ASA, EA, FCA, MAAA and David T. Kausch, FSA, EA, FCA, MAAA

Gabriel, Roeder, Smith & Company

**DATE:** February 27, 2015

This report presents results of a supplemental actuarial valuation to determine the effects of the proposed changes under House Bill No. 770 (HB 770).

This report is intended to describe the financial effect of the proposed changes. No statement in this report is intended to be interpreted as a recommendation in favor of the changes, or in opposition to them. The date of the valuation was June 30, 2014. Brad Lee Armstrong and David T. Kausch are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

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

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

- The assumed rate of interest was 8.0%.
- Payroll was assumed to increase 3% per year.
- For the regular valuation, the Unfunded Actuarial Accrued Liability is amortized over 30 years. By Board Policy, the employer contribution rate shall not be reduced until the plan is 80% funded.

We believe the assumptions are internally consistent and reasonable, based on the actual experience of MOSERS. These actuarial assumptions and methods comply with current actuarial standards of practice.

The active group size is assumed to remain constant.

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

			Group Averages				
Valuation Group	Number	Payroll	Salary	Age(yrs.)	Service(yrs.)		
Total MOSERS	50,621	\$ 1,902,719,928	\$ 37,588	45.7	11.3		

#### **Summary of Proposed Changes**

#### **Current Plan Provisions**

The surviving spouse benefit is computed as if the member had been normal retirement age on the date of death and elected the joint and 100% survivor optional form of payment, provided the member had at least 5 years of credited service (3 full assemblies for a member of the General Assembly in MSEP 2000, 2 full assemblies for a member of the General Assembly in MSEP 2011, 4 years of credited service for a statewide elected official in MSEP 2000 or MSEP 2011). If no eligible spouse survives, 80% of the member's life income annuity is paid to eligible children until age 21. If the death is duty related, the service requirement is waived and the minimum spouse benefit is 50% of Average Compensation (rate of compensation for members of the General Assembly).

#### **Proposed Plan Provisions**

The surviving spouse benefit is computed as if the member had been normal retirement age on the date of death and elected the joint and 100% survivor optional form of payment, provided the member had at least 5 years of credited service (3 full assemblies for a member of the General Assembly in MSEP 2000, 2 full assemblies for a member of the General Assembly in MSEP 2011, 4 years of credited service for a statewide elected official in MSEP 2000 or MSEP 2011). If no eligible spouse survives, 80% of the member's life income annuity is paid to eligible children until age 21. If the death is duty related, the service requirement is waived and the minimum spouse benefit is 50% of Average Compensation (rate of compensation for members of the General Assembly).

If no such annuity is payable to a surviving spouse or eligible surviving children under age 21, the designated beneficiary shall receive the eligible benefit as if the member had elected the one hundred and twenty month certain optional form of payment. If no beneficiary has been designated by the member, the reserve for the one hundred and twenty month period shall be paid as provided under subsection 3 of Section 104.620.

#### **Actuarial Statement**

**Impact on MOSERS DB Employer** 

	Contributions				
	Present	Proposed	Increase/		
	Benefits	Benefits	(Decrease)		
FY 2015-16 Contribution					
Total Normal Cost	8.21 %	8.28 %	0.07 %		
Member Contribution Rate	(1.32)	(1.32)	0.00		
UAAL% *	9.06	9.22	0.16		
Total Employer Contribution Rate	15.95 %	16.18 %	0.23 %		
Employer Normal Cost (\$ millions)	\$ 139.1	\$ 140.5	\$ 1.4		
Estimated Employer Contribution (\$ millions)	\$ 322.0	\$ 326.6	\$ 4.6		
Valuation Results as of June 30, 2014 (\$ millions)					
Market Value of Assets (MVA)	\$ 9,136.8	\$ 9,136.8	\$ -		
Actuarial Accrued Liability (AAL)	11,494.6	11,536.8	42.2		
Actuarial Value of Assets (AVA)	8,637.8	8,637.8			
Unfunded Actuarial Accrued Liability (UAAL)	\$ 2,856.8	\$ 2,899.0	\$ 42.2		
Percent Funded	75.1 %	74.9 %	(0.2) %		

<sup>\*</sup> The change in unfunded actuarial accrued liability as a result of the proposal is amortized over a period of 20 years as required under RSMo Chapter 105.684

# **Projected Change in Annual Employer Contributions** (In Thousands)

	Current Provisions (Beginning of Year)			Proposed Provisions (Beginning of Year)				Projected DB Employer Contributions						
Fiscal	Projected	Projected	Funded	Projected	Projected	Projected	Funded	Projected	Cı	ırrent	Est. 1	impact	Pro	posed
Year	AAL	AVA	Ratio	MVA	AAL	AVA	Ratio	MVA	Rate	Dollars	Rate	Dollars	Rate	Dollars
2015	\$11,494,572	\$ 8,637,759	75.1%	\$ 9,136,782	\$11,536,781	\$ 8,637,759	74.9%	\$9,136,782						
2016	11,876,237	8,990,806	75.7%	9,090,149	11,923,223	8,990,746	75.4%	9,090,780	15.95%	\$ 312,588	0.23%	\$ 4,508	16.18%	\$ 317,096
2017	12,233,084	9,305,846	76.1%	9,400,156	12,284,915	9,310,192	75.8%	9,405,109	15.71%	317,121	0.23%	4,643	15.94%	321,764
2018	12,560,849	9,594,691	76.4%	9,671,916	12,617,546	9,603,533	76.1%	9,679,376	15.49%	322,061	0.23%	4,782	15.72%	326,843
2019	12,862,399	9,860,314	76.7%	9,922,294	12,924,946	9,874,705	76.4%	9,935,666	15.27%	327,011	0.23%	4,926	15.50%	331,937
2020	13,140,057	10,105,516	76.9%	10,151,122	13,209,289	10,126,373	76.7%	10,173,583	15.06%	332,190	0.23%	5,073	15.29%	337,263
2021	13,397,164	10,333,906	77.1%	10,364,291	13,472,637	10,360,873	76.9%	10,391,455	14.87%	337,839	0.23%	5,225	15.10%	343,064
2022	13,636,940	10,549,408	77.4%	10,570,797	13,718,840	10,582,775	77.1%	10,604,870	14.68%	343,527	0.23%	5,382	14.91%	348,910
2023	13,859,832	10,752,596	77.6%	10,768,685	13,948,073	10,792,390	77.4%	10,808,641	14.51%	349,736	0.23%	5,544	14.74%	355,279
2024	14,064,648	10,943,132	77.8%	10,952,670	14,159,387	10,989,628	77.6%	11,000,165	14.33%	355,759	0.23%	5,710	14.56%	361,469
2025	14,250,907	11,120,934	78.0%	11,122,680	14,351,856	11,173,986	77.9%	11,176,047	14.18%	362,596	0.23%	5,881	14.41%	368,478
2026	14,418,820	11,287,204	78.3%	11,279,470	14,525,988	11,346,974	78.1%	11,340,434	14.03%	369,523	0.23%	6,058	14.26%	375,581

Numbers may not add due to rounding.

	BOY						
	Valuation						
Fiscal	Payroll						
Year	Projected						
2015	\$ 1,902,720						
2016	1,959,802						
2017	2,018,596						
2018	2,079,153						
2019	2,141,528						
2020	2,205,774						
2021	2,271,947						
2022	2,340,106						
2023	2,410,309						
2024	2,482,618						
2025	2,557,096						
2026	2,633,809						

**Comment A:** The funded ratio of the plan in the June 30, 2014 annual actuarial valuation is 75.1% which is below the 80% threshold described in RSMo Chapter 105.684 regarding adopting or implementing certain benefit changes. The calculations shown in this report reflect the estimated impact of the proposed change as if it were implemented.

**Comment B**: The normal cost for the current population is expected to increase by 0.07% of payroll as a result of the change. For 2011 Plan members, the normal cost is expected to increase 0.06% of payroll. Over time, the active membership of the plan is expected to be replaced by 2011 Plan members. Therefore, the impact on the normal cost is expected to gradually decline from 0.07% of payroll to 0.06% of payroll as the 2011 Plan member population grows.

**Comment C**: The change in unfunded actuarial accrued liability as a result of the proposal is amortized over a period of 20 years as required under RSMo. Chapter 105.684. For purposes of the projection, the 20-year period is treated as a closed amortization separate from the closed 30-year amortization of the current unfunded actuarial accrued liability.

**Comment D**: For purposes of estimating the impact of this proposal, the assumption regarding preretirement deaths was changed from 70% married prior to retirement eligibility and 75% married at retirement eligibility to an assumption of 100% probability of survivor benefits payable. For purposes of modeling this change to 100%, the married assumption was increased to 95% with a 100% joint and survivor benefit payable to reflect the possibility that non-spouse beneficiaries would only receive 120 months of payments. A more detailed method of modeling this change was outside the scope of the project.

**Comment E:** At the September 17, 2014 Board meeting, the Board adopted a minimum funding policy such that the employer contribution rate will be no less than 16.97% of payroll (the rate calculated in the June 30, 2013 valuation) until such a time as the plan is at least 80% funded on an actuarial value of assets basis. However, since the minimum contribution rate obfuscates the financial impact of the proposal, this supplemental valuation *does not reflect* the minimum funding policy.

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

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

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

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

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

#### **Summary of Assumptions Used**

#### for the June 30, 2014 Actuarial Valuation

------Economic Assumptions -----

The economic assumptions were adopted by the Board on July 19, 2012 to be first effective for the June 30, 2012 valuation.

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

*Pay increase assumptions* for individual active members are shown for sample ages on page 9. Part of the assumption for each age is for merit and/or seniority increase, and the other 3.0% recognizes wage inflation. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

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

The annual Cost-of-Living Adjustment (COLA) is assumed to be 4.00%, on a compounded basis, when a minimum COLA of 4% is in effect (4.0% for 12 years, 3.06% the next year to reach a cumulative 65% followed by 2.0%). When no minimum COLA is in effect, price inflation is assumed to be 2.5% and the annual COLA is assumed to be 2.0% (80% of 2.5%), on a compounded basis.

#### ----- Non-Economic Assumptions -----

The demographic assumptions were adopted by the Board on June 20, 2012 to be first effective for the June 30, 2012 valuation.

The mortality table, for post-retirement mortality, used in evaluating allowances to be paid was the RP 2000 combined healthy mortality table, projected to 2016 with Scale AA. Related values are shown on page 10. This assumption is used to measure the probabilities of each benefit payment being made after retirement. The pre-retirement mortality rates used were 100% of the post-retirement mortality rates for males and 80% of the post-retirement mortality for females.

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

# **Summary of Assumptions Used** for the June 30, 2014 Actuarial Valuation

**The probabilities of age and service retirement** are shown on page 11. It was assumed that each member will be granted one half year (4 months for 2011 plan members) of service credit for unused leave upon retirement and military service purchases.

The probabilities of withdrawal from service, disability and death-in-service are shown for sample ages on page 9. For disability retirement, impaired longevity was recognized by use of special mortality tables.

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

The amortization of the unfunded actuarial accrued liability is based on a closed 30-year amortization period, level percent-of-payroll amortization. This method was first effective with the June 30, 2014 valuation. The amortization is based on the projected unfunded actuarial accrued liability to the beginning of the fiscal year during which the contributions are expected to be made.

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

Actuarial value of assets. Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased-in over an open three-year period. Valuation assets are not permitted to deviate from the market value by less than 80% or more than 125%.

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

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

For members on long-term disability, the actuarial accrued liability is the present value of benefits under active assumptions plus the difference of the present value of benefits with and without future pay growth to reflect indexing of pay in ultimate retirement benefits.

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The actuarial valuation computations were made by or under the supervision of Brad Lee Armstrong and David T. Kausch who are Members of the American Academy of Actuaries (MAAA).

#### Separations from Active Employment before Service Retirement and Individual Pay Increase Assumptions as of June 30, 2014

			Perc	ent of Act	Pay Increase Assumptions						
			Se parat	ing within	the Next	Year		For An Individual Employee			
Sample	Years of	Withdr	awal ***	De	eath*	Dis	sability	Merit &	Base	Increase	
Ages	Service	Men	Women	Men	Women	Men	Women	Seniority**	(Economy)	Next Year	
	0	23.0 %	26.9 %								
	1	18.0	20.5								
	2	15.0	15.4								
	3	13.0	12.5								
	4	11.0	10.9								
25	5+	13.0	13.3	0.03 %	0.01 %	0.17 %	0.30 %	2.9 %	3.0 %	5.9 %	
30		10.2	10.5	0.04	0.02	0.17	0.30	2.2	3.0	5.2	
35		7.9	8.1	0.07	0.03	0.21	0.30	1.6	3.0	4.6	
40		5.6	5.7	0.09	0.04	0.26	0.32	1.2	3.0	4.2	
45		4.2	4.3	0.12	0.07	0.34	0.38	0.9	3.0	3.9	
<b>7</b> 0		2.0	2.0	0.16	0.40	0.40	0.55	o <b>=</b>	2.0	2.7	
50		2.8	2.9	0.16	0.10	0.49	0.57	0.7	3.0	3.7	
55		2.8	2.9	0.27	0.19	1.07	0.89	0.5	3.0	3.5	
60		2.8	2.9	0.52	0.37	1.50	1.50	0.4	3.0	3.4	
65		2.8	2.9	1.02	0.72	1.60	1.70	0.3	3.0	3.3	
70		2.8	2.9	1.74	1.24	1.60	1.70	0.2	3.0	3.2	

<sup>\* 2%</sup> of the deaths in active service are assumed to be duty related.

#### **Elected Officials and Legislators**

## Percent of Active Members Separating within the Next Year

***************************************						
Years of	Withdrawal					
Service	Male/Female					
1	8.0 %					
2	8.0					
3	8.0					
4	8.0					
5	12.0					
6	12.0					
7	12.0					
8+	35.0					

<sup>\*\*</sup> Does not apply to members of the General Assembly.

<sup>\*\*\*</sup> Does not apply to Elected Officials and Legislators.

#### **Post-Retirement Mortality Rates**

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

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

#### Retirement Values June 30, 2014

Sample				First Year easing 4.0%			Month the F 2.0% Yearly	
Attained	Sei	rvice	Disa	ability	Serv	ice	Disal	bility
Ages	Men	Women	Men	Women	Men	Women	Men	Women
40	\$224.11	\$224.12	\$212.76	\$211.89	\$184.40	\$186.75	\$169.01	\$172.32
45	217.22	217.01	202.65	201.39	177.68	180.43	157.94	162.08
50	208.28	207.81	190.14	188.39	169.01	172.32	144.49	149.76
55	196.76	196.07	175.18	172.83	157.94	162.08	128.94	135.56
60	182.48	181.61	157.88	154.80	144.49	149.76	111.76	119.87
65	165.46	164.49	138.11	134.44	128.94	135.56	92.72	102.82
70	145.94	144.91	116.94	112.03	111.76	119.87	73.10	84.62
75	123.90	123.17	96.04	88.83	92.72	102.82	55.15	66.19
80	100.55	100.10	76.52	68.15	73.10	84.62	40.28	50.49
85	78.09	77.41	59.89	52.82	55.15	66.19	30.32	40.10

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

### Percent of Eligible Active Members Retiring Next Year

	Norma	l Retirem en	Earl	y Retirement F	Pattern		
		P and MSEP		MSEP 2011**		MSEP and MSEP 2000*	MSEP 2011**
Retirement	P	ercent Eligil	bl e	Percent	Retirement	Percent	Percent
Age	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	Eligible	Age	Eligible	Eligible
48	22%						
49	22	10%					
50	22	10	21%				
51	22	10	21				
52	22	10	21				
53	22	10	18				
54	22	10	18				
55	22	12	26	45%			
56	22	12	25	45			
57	22	12	22	35	57	2.5%	
58	22	12	22	35	58	3.5	
59	22	12	20	30	59	3.5	
60	21	12	22	35	60	5.0	
61	20	12	20	25	61	6.0	
62	19	22	30	40	62	6.0	10%
63	15	18	25	30	63	6.0	10
64	15	20	17	20	64	6.0	10
65	20	20	27	30	65	6.0	50
66	22	20	26	25	66	6.0	50
67	15	25	22	20	67	6.0	
68	15	20	22	20	68	6.0	
69	15	20	22	20	69	6.0	
70	25	20	22	20	70	6.0	
71	25	20	22	20	71	6.0	
72	25	20	22	20	72	6.0	
73	25	20	22	20	73	6.0	
74	25	20	22	20	74	6.0	
75	50	50	22	50	75	6.0	
76	50	50	22	50	76	6.0	
77	75	75	22	75	77	6.0	
78	100	100	100	100	78	100.0	

<sup>For members hired prior to January 1, 2011.
For members hired on or after January 1, 2011.</sup> 

#### Summary of Assumptions Used June 30, 2014

#### **Miscellaneous and Technical Assumptions**

**Pay Increase Timing:** Beginning of (Fiscal) year.

**Decrement Timing:** Decrements of all types are assumed to occur mid-year.

**Eligibility Testing:** Eligibility for benefits is determined based upon the age nearest

birthday and service nearest whole year on the date the

decrement is assumed to occur.

**Benefit Service:** Exact fractional service is used to determine the amount of the

benefit payable.

**Decrement Relativity:** Decrement rates are used directly from the experience study,

without adjustment for multiple decrement table effects.

**Decrement Operation:** Disability and withdrawal do not operate during normal

retirement eligibility.

**Normal Form of Benefit:** The assumed normal form of benefit is the straight life form for

MSEP 2000 with 50% continuing to an eligible surviving spouse for MSEP. No adjustment has been made for post-retirement

option election changes.

Other Liability Adjustments: MSEP 2000 Benefits for Active Employees

Option elections were studied for MSEP 2000 retirees and we believe that the normal and early retirement alternate forms of payment assumption are slightly negatively subsidized. We have adjusted the actuarial accrued liability and normal cost by a factor of 0.99 for MSEP 2000 and MSEP 2011 retirements and by .995 for MSEP retirements based on the current rate of form of payment elections.

## Pre-Retirement Survivor Benefits for Spouse of Terminated Vested Member

<u>Age</u>	Male/Female
<30	1.97/1.68
30-39	1.40/1.29
40-49	1.15/1.11
>50	1.04/1.03

These factors are used to estimate the cost of immediate unreduced survivor annuities upon the death of a vested member.

# Summary of Assumptions Used June 30, 2014 Miscellaneous and Technical Assumptions (Continued)

Incidence of Contributions: Contributions are assumed to be received continuously

throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. New entrant normal cost contributions

are applied to the funding of new entrant benefits.

**MSEP 2000 Election:** All regular state employees hired on or before June 30, 2000 are

assumed to elect MSEP 2000 prior to age 62 and MSEP on or after age 62. Elected Officials, General Assembly, and Uniformed Water Patrol Members hired before July 1, 2000 and Administrative Law Judges hired before April 26, 2005 are

assumed to elect MSEP at retirement.

**Service Adjustment:** It is assumed that each member will be granted one half year of

service credit, 3 months for unused leave upon retirement and 3 months for military service purchases. For members hired on or after January 1, 2011 it is assumed that each member will be

granted 4 months for unused leave.

Marriage Assumption: It is assumed that among active members 95% are married at

retirement, 95% of those dying in active service are married, and

men are three years older than their spouses.

For feitures: For those hired on or after January 1, 2011, 50% of state

employees terminating at first vesting eligibility are assumed to take a refund and forfeit their deferred pension. This percentage

decreases to 0% at first retirement eligibility.

**Salary and Benefit Limits:** For purposes of the valuation, no limits were applied to member

compensation or benefits.

The number of active members is assumed to remain constant although certain new hires on or after July 1, 2002 will participate in the Colleges and Universities Retirement Plan. Active and retired member data is reported as of May 31. It is assumed for valuation purposes that there is no turnover among members and no new entrants during the month of June. New entrant assumed demographic patterns are based on the demographics of active members hired within the last five years.