GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

CORRECTIONAL EMPLOYEES RETIREMENT FUND

MINNESOTA STATE RETIREMENT SYSTEM

ACTUARIAL VALUATION REPORT AS OF JULY 1, 2012

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
100 South Fifth Street
Suite 1900
Minneapolis, MN 55402-1267
612.605.6200 phone
612.605.6203 fax
www.gabrielroeder.com

December 2012

Minnesota State Retirement System
Correctional Employees Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

The results of the July 1, 2012 annual actuarial valuation of the Correctional Employees Retirement Fund are presented in this report. This report was prepared at the request of the Board and is intended for use by the Retirement Fund and those designated or approved by the Board. This report may be provided to parties other than the Fund only in its entirety. GRS is not responsible for the consequences of any unauthorized use of this report.

The purpose of the valuation is to measure the Fund's funding progress, to determine the required contribution rate for the fiscal year beginning July 1, 2012, and to determine the actuarial information for Governmental Accounting Standards Board (GASB) Statement No. 25. Note that we have not attempted to quantify the impact of GASB Statements No. 67 and No. 68 in this report.

The valuation was based upon information furnished by the Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions, active members, terminated members, retirees, and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by MSRS.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Directors. These parties are responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in the Actuarial Basis of this report. MSRS is solely responsible for communicating to GRS any changes required thereto.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

This report should not be relied on for any purpose other than the purpose described in the primary communication. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

The undersigned actuaries are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of “approved actuary” under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the Correctional Employees Retirement Fund as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

We are available to answer any questions or provide further details.

Respectfully submitted,

Brian B. Murphy

Brian B. Murphy, FSA, EA, MAAA

Bonita J. Wurst

Bonita J. Wurst, ASA, EA, MAAA

BBM/BJW:sc

Contents

Summary of Valuation Results

Contributions

The following table summarizes important contribution information as described in the Development of Costs section.

Contributions	Actuarial Valuation as of July 1, 2012	Actuarial Valuation as of July 1, 2011
Statutory Contributions - Chapter 352.92 (% of Payroll)	20.70%	20.70%
Required Contributions - Chapter 356 (% of Payroll)	25.28%	26.00%
Sufficiency / (Deficiency)	(4.58%)	(5.30%)

The contribution deficiency decreased from (5.30%) of payroll to (4.58%) of payroll. The primary reason for the decreased contribution deficiency is the recognition of assumption changes. Please see page 3 for additional detail about these changes. A significant contribution deficiency remains. Without further changes or favorable actuarial experience, the funded status will deteriorate in the future and assets will be depleted.

Statutory contributions are not sufficient to fully amortize the unfunded actuarial accrued liability over the statutory amortization period of 26 years. Based on the current member and employer contribution rates and other methods and assumptions described in this report, an infinite number of years would be required to eliminate the unfunded liability (the unfunded liability will never be eliminated).

The Plan Assets section provides detail on the plan assets used for the valuation including a development of the actuarial value of assets (AVA). The market value of assets (MVA) earned approximately 2.4% for the plan year ending June 30, 2012. The AVA earned approximately 4.6% for the plan year ending June 30, 2012 as compared to the assumed rate of 8.5%. This statutory rate is mandated by Minnesota Statutes.

Participant reconciliation and statistics are detailed in the Membership Data section. The Actuarial Basis section includes a summary of plan provisions and actuarial methods and assumptions used for the calculations in this report. The Plan Accounting sections detail the required accounting information for the Plan under GASB No. 25 (as amended by GASB No. 50).

Summary of Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in plan provisions, actuarial assumptions or valuation methods and procedures between the two valuations are described after the summary.

	Actuarial Valuation as of	
	July 1, 2012	**July 1, 2011**
Contributions (*% of Payroll*)		
Statutory - Chapter 352	20.70%	20.70%
Required - Chapter 356	25.28%	26.00%
Sufficiency / (Deficiency)	(4.58%)	(5.30%)
Funding Ratios (*dollars in thousands*)		
Assets		
- Current assets (AVA)	$ 663,713	$ 637,027
- Current assets (MVA)	659,523	646,582
Accrued Benefit Funding Ratio		
- Current benefit obligations	$ 911,227	$ 874,921
- Funding ratio (AVA)	72.84%	72.81%
- Funding ratio (MVA)	72.38%	73.90%
Accrued Liability Funding Ratio		
- Actuarial accrued liability	$ 968,166	$ 907,012
- Funding ratio (AVA)	68.55%	70.23%
- Funding ratio (MVA)	68.12%	71.29%
Projected Benefit Funding Ratio		
- Current and expected future assets	$ 1,050,067	$ 989,551
- Current and expected future benefit obligations	1,199,216	1,169,736
- Projected benefit funding ratio (AVA)	87.56%	84.60%
Participant Data		
Active members		
- Number	4,276	4,322
- Projected annual earnings *(000s)*	212,056	205,608
- Average projected annual earnings	49,592	47,572
- Average age	41.6	41.6
- Average service	8.7	8.6
Service retirements	1,773	1,621
Survivors	180	165
Disability retirements	244	230
Deferred retirements	1,180	1,035
Terminated other non-vested	473	501
Total	**8,126**	**7,874**

Summary of Valuation Results

The 2011 valuation was prepared by Mercer. As part of the transition of actuarial work from Mercer to GRS, we replicated the 2011 valuation including a change from beginning of year decrement timing to mid-year decrement timing. The results of this replication are as follows:

	Valuation Results As of July 1, 2011 (000's)		
	Mercer	**GRS**	**Ratio**
Present Value of Projected Benefits	$1,169,736	$1,179,840	100.9%
Actuarial Accrued Liability	907,012	902,989	99.6%
Required Contributions (% of pay)	26.00%	25.70%	98.8%

Differences in valuation results due to differences in actuarial software are not unexpected. The replication results indicate a high degree of consistency.

Effects of Changes

The following changes in actuarial assumptions were recognized as of July 1, 2012:

- The investment return assumption was changed from 8.5% pre-retirement and 6.5% post-retirement to a 5-year select and ultimate approach with rates of 8.0% pre-retirement and 6.0% post-retirement for the period July 1, 2012 to June 30, 2017 and 8.5% pre-retirement and 6.5% post-retirement thereafter.
- Healthy pre-retirement mortality was changed from 1983 Group Annuity Mortality set back five years for males and set back two years for females to RP-2000 employee generational mortality, white collar adjustment.
- Healthy post-retirement mortality was changed from 1983 Group Annuity Mortality set back two years for males and set back one year for females to RP-2000 annuitant generational mortality, white collar adjustment, set forward one year for males and set back one year for females.
- Disabled retired mortality was changed to RP-2000 disabled mortality. The previous table was based on the Combined Annuity Mortality table up to age 40, grading to healthy mortality for ages 60 and over.
- The salary scale assumption was changed from an age related table to a service related table that generally reflects lower expected salary increases.
- The payroll growth assumption was changed from 4.50% to 3.75%.
- The form of benefit assumption for active married members changed as follows:

Form of Payment	Male Assumption Last Year	Female Assumption Last Year	Male Assumption This Year	Female Assumption This Year
Straight Life Annuity	50%	90%	40%	50%
50% Joint & Survivor	25%	5%	10%	10%
75% Joint & Survivor	0%	0%	10%	10%
100% Joint & Survivor	25%	5%	40%	30%

- Retirement, termination and disability rates were adjusted to more closely reflect actual experience. Select termination rates were changed from 10% per year for the first three years of employment to 20%, 15%, and 8%, respectively.

Summary of Valuation Results

Effects of Changes (Concluded)

The combined impact of the above changes was to decrease the accrued liability by $8.3 million and decrease the required contribution by 1.4% of pay, as follows:

	Before Assumption Changes	Reflecting Assumption Changes
Normal Cost Rate, % of pay	17.4%	15.7%
Amortization of Unfunded Accrued Liability, % of pay	9.0%	9.3%
Expenses (% of pay)	0.3%	0.3%
Total Required Contribution, % of pay	26.7%	25.3%
Accrued Liability Funding Ratio	68.0%	68.6%
Projected Benefit Funding Ratio	83.3%	87.6%
Unfunded Accrued Liability (in millions)	$312.8	$304.5

Refer to the Actuarial Basis section of this report for a complete description of these changes.

Summary of Valuation Results

Valuation of Future Post-Retirement Benefit Increases

A very important assumption affecting the valuation results is the expectation of future post-retirement benefit increases. The plan's accrued liability funding ratio (on a market value of assets basis and assuming 2.0% post-retirement benefit increases in all future years) is currently 68.1%. If the plan reaches a funding ratio of 90% (on a market value of assets basis) in the future, post-retirement increases will revert to the 2.5% level.

The liabilities in this report are based on the assumption that the post-retirement benefit increase will remain at the reduced level of 2.0% indefinitely. We relied on direction from MSRS, including MSRS' interpretation of applicable Minnesota Statutes, on this issue. If we assumed future post-retirement benefit increases of 2.5% instead of 2.0%, the actuarial accrued liability would be $991 million instead of $968 million, resulting in a funded ratio of 66.6% (on a market value basis) as of July 1, 2012.

Supplemental Information

The remainder of the report includes information supporting the results presented in the previous sections.

- **Plan assets** presents information about the plan's assets as reported by the Minnesota State Retirement System. The assets represent the portion of total fund liabilities that has been funded.

- **Membership data** presents and describes the membership data used in the valuation.

- **Development of costs** shows the liabilities for plan benefits and the derivation of the contribution amount.

- **Actuarial basis** describes the plan provisions, as well as the methods and assumptions used to value the plan. The valuation is based on the premise that the plan is ongoing.

- **Plan accounting under GASB No. 25 (as amended by GASB No. 50)** shows the disclosures required by GASB No. 25 as amended by GASB No. 50.

- **Glossary** defines the terms used in this report.

Plan Assets

Statement of Plan Net Assets as of June 30, 2012 *(Dollars in Thousands)*

Assets Held in Trust		**Market Value**
Cash, equivalents, short term securities	$	15,273
Fixed income		146,439
Equity		497,802
Other*		59,745
Total cash, investments, and other assets	**$**	**719,259**
Amounts Receivable		1,295
Total Assets	**$**	**720,554**
Amounts Payable*		(61,031)
Net Assets Held in Trust for Pension Benefits	**$**	**659,523**

** Includes $59,745 in Securities Lending Collateral.*

Plan Assets

Reconciliation of Plan Assets *(Dollars in Thousands)*

The following exhibit shows the revenue, expenses and resulting assets of the Fund as reported by the Minnesota State Retirement System for the Plan's Fiscal Year July 1, 2011 to June 30, 2012.

Change in Assets	**Market Value**
1. Fund balance at market value at July 1, 2011	$ 646,582
2. Contributions	
a. Member	17,203
b. Employer	24,188
c. Other sources	0
d. Total contributions	$ 41,391
3. Investment income	
a. Investment income/(loss)	16,822
b. Investment expenses	(896)
c. Net investment income/(loss)	15,926
4. Other	0
5. Total income: *(2.d.) + (3.c.) + (4.)*	**$ 57,317**
6. Benefits Paid	
a. Annuity benefits	(42,571)
b. Refunds	(1,257)
c. Total benefits paid	(43,828)
7. Expenses	
a. Other	0
b. Administrative	(548)
c. Total expenses	(548)
8. Total disbursements: *(6.c.) + (7.c.)*	**(44,376)**
9. Fund balance at market value at July 1, 2012: *(1.) + (5.) + (8.)*	**$ 659,523**

Plan Assets

Actuarial Asset Value *(Dollars in Thousands)*

			June 30, 2012
1. Market value of assets available for benefits			$ 659,523
2. Determination of average balance			
a. Total assets available at July 1, 2011			646,582
b. Total assets available at June 30, 2012			659,523
c. Net investment income for fiscal year ending June 30, 2012			15,926
d. Average balance *[a. + b. - c.] / 2*			645,090
3. Expected return *[8.5% * 2.d.]*			54,833
4. Actual return			15,926
5. Current year asset gain/(loss) *[4. - 3.]*			(38,907)
6. Unrecognized asset returns			
	Original Amount	**% Not Recognized**	
a. Year ended June 30, 2012	(38,907)	80%	(31,126)
b. Year ended June 30, 2011	76,770	60%	46,062
c. Year ended June 30, 2010	30,070	40%	12,028
d. Year ended June 30, 2009	(155,770)	20%	(31,154)
e. Unrecognized return adjustment			(4,190)
7. **Actuarial value at June 30, 2012** *(1. - 6.e.)*			**$ 663,713**

Membership Data

Distribution of Active Members

	Years of Service as of June 30, 2012									
Age	**<3***	**3 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35+**	**Total**
< 25	83	4								**87**
Avg. Earnings	28,801	31,592								**28,929**
25 - 29	289	142	129							**560**
Avg. Earnings	32,294	38,897	41,351							**36,055**
30 - 34	159	134	341	38						**672**
Avg. Earnings	35,021	41,167	43,766	50,487						**41,559**
35 - 39	86	69	243	138	20					**556**
Avg. Earnings	38,008	42,548	43,909	52,104	62,022					**45,513**
40 - 44	75	63	179	129	117	15				**578**
Avg. Earnings	35,032	42,940	46,321	52,859	58,628	65,859				**48,945**
45 - 49	73	62	172	131	125	79	21			**663**
Avg. Earnings	36,867	44,873	49,418	52,297	58,737	61,590	65,529			**51,898**
50 - 54	62	55	148	118	115	99	72	17		**686**
Avg. Earnings	39,230	45,027	51,989	54,532	56,428	62,737	65,626	64,587		**54,754**
55 - 59	27	40	112	74	50	23	11	11	2	**350**
Avg. Earnings	46,215	50,124	55,053	56,312	55,861	56,187	64,764	62,697	86,700	**54,991**
60 - 64	11	9	36	24	13	7	1	1		**102**
Avg. Earnings	52,154	45,967	57,960	63,294	63,509	57,484	60,054	62,926		**58,275**
65 - 69	3		9	4	1					**17**
Avg. Earnings	49,088		57,084	60,934	63,245					**56,941**
70+		2	2		1					**5**
Avg. Earnings		30,196	20,281		41,595					**28,510**
Total	**868**	**580**	**1,371**	**656**	**442**	**223**	**105**	**29**	**2**	**4,276**
Avg. Earnings	**34,885**	**42,319**	**46,843**	**53,572**	**58,042**	**61,701**	**65,463**	**63,813**	**86,700**	**47,358**

* *This exhibit does not reflect service earned in other MSRS or Combined Service Annuity benefits. It should not be relied upon as an indicator of non-vested status.*

In each cell, the top number is the count of active participants for the age/service combination and the bottom number is average valuation earnings for the fiscal year ending on the valuation date.

Membership Data

Distribution of Service Retirements*

	Years Retired as of June 30, 2012							
Age	**<1**	**1 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25+**	**Total**
<50								
Avg. Benefit								
50 - 54	30	43	1					**74**
Avg. Benefit	19,601	23,988	8,158					**21,996**
55 - 59	92	247	54					**393**
Avg. Benefit	24,190	24,803	25,022					**24,690**
60 - 64	26	119	334	37				**516**
Avg. Benefit	11,938	16,559	22,641	19,883				**20,501**
65 - 69	14	69	88	231	2			**404**
Avg. Benefit	10,152	9,332	14,484	19,906	6,223			**16,513**
70 - 74	1	12	37	56	60	1		**167**
Avg. Benefit	5,937	12,923	12,809	19,997	25,564	19,047		**19,806**
75 - 79			6	37	25	39		**107**
Avg. Benefit			14,108	19,788	19,581	28,592		**22,630**
80 - 84			1	3	7	22	27	**60**
Avg. Benefit			2,539	6,987	21,815	20,273	28,756	**23,310**
85 - 89						4	26	**30**
Avg. Benefit						15,980	27,709	**26,145**
90+							13	**13**
Avg. Benefit							16,845	**16,845**
Total	**163**	**490**	**521**	**364**	**94**	**66**	**66**	**1,764**
Avg. Benefit	**20,073**	**20,260**	**20,647**	**19,799**	**23,282**	**24,910**	**25,998**	**20,812**

In each cell, the top number is the count of retired participants for the age/years retired combination and the bottom number is the average annual benefit amount.

** Exhibit excludes 9 individuals reported in 2012 without a benefit.*

Membership Data

Distribution of Survivors*

	Years Since Death as of June 30, 2012							
Age	**<1**	**1 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25+**	**Total**
<45	1	6	3	1				**11**
Avg. Benefit	7,701	6,266	3,804	2,291				**5,364**
45 - 49	1	1	3	2				**7**
Avg. Benefit	20,135	3,688	8,354	8,109				**9,300**
50 - 54	1	9	2	1	2			**15**
Avg. Benefit	8,573	10,414	14,583	14,045	10,214			**11,063**
55 - 59	5	14	12	4	1			**36**
Avg. Benefit	8,452	15,083	14,525	7,529	7,440			**12,924**
60 - 64	2	7	15	4	3	1		**32**
Avg. Benefit	14,847	10,002	11,079	18,199	6,354	9,242		**11,469**
65 - 69	6	7	9	5	3	1		**31**
Avg. Benefit	18,470	14,938	14,532	11,684	16,176	6,396		**14,823**
70 - 74	2	2	3	3	2			**12**
Avg. Benefit	9,434	18,726	14,387	27,288	13,631			**17,384**
75 - 79	2	3	5	4	3	1	1	**19**
Avg. Benefit	18,457	32,614	17,971	15,622	10,457	12,988	20,483	**18,523**
80 - 84	1	1	3				1	**6**
Avg. Benefit	11,528	7,729	9,902				6,456	**9,236**
85 - 89		2		1	2	1		**6**
Avg. Benefit		13,588		15,112	14,561	8,517		**13,321**
90+		1					3	**4**
Avg. Benefit		11,329					8,466	**9,182**
Total	**21**	**53**	**55**	**25**	**16**	**4**	**5**	**179**
Avg. Benefit	**13,642**	**13,250**	**12,721**	**14,134**	**11,451**	**9,286**	**10,468**	**12,930**

In each cell, the top number is the count of survivors for the age/years since death combination and the bottom number is the average annual benefit amount.

** Exhibit excludes 1 individual reported in 2012 with an expired benefit.*

Membership Data

Distribution of Disability Retirements*

	Years Disabled as of June 30, 2012							
Age	**<1**	**1 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25+**	**Total**
< 45	5	18	8	8				**39**
Avg. Benefit	15,635	16,359	15,914	18,129				**16,538**
45 - 49	3	5	14	7	3			**32**
Avg. Benefit	17,792	17,230	18,334	18,674	15,265			**17,897**
50 - 54	7	14	12	9	3			**45**
Avg. Benefit	19,378	18,848	19,223	21,193	21,349			**19,666**
55 - 59	3	20	14	11	6			**54**
Avg. Benefit	13,636	17,319	19,676	21,931	17,681			**18,705**
60 - 64	1	8	19	16	3	1		**48**
Avg. Benefit	20,802	14,221	19,462	17,883	20,442	20,072		**18,164**
65 - 69	1	1	5	9	2			**18**
Avg. Benefit	17,048	13,842	20,871	18,349	16,444			**18,515**
70 - 74			2	1	3			**6**
Avg. Benefit			13,502	19,308	25,397			**20,417**
75+							1	**1**
Avg. Benefit							24,274	**24,274**
Total	**20**	**66**	**74**	**61**	**20**	**1**	**1**	**243**
Avg. Benefit	**17,298**	**16,947**	**18,801**	**19,317**	**19,317**	**20,072**	**24,274**	**18,373**

In each cell, the top number is the count of disabled participants for the age/years since disability combination and the bottom number is the average annual benefit amount.

** Exhibit excludes 1 individual reported in 2012 without a benefit.*

Membership Data

Reconciliation of Members*

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2011	**4,322**	**1,035**	**501**	**1,621**	**230**	**165**	**7,874**
Additions	461	195	122	178	22	4	**982**
Return to active	15	(9)	(6)	0	0	0	**0**
Terminated non-vested	(86)	0	0	0	0	0	**(86)**
Service retirements	(148)	(27)	(2)	0	0	0	**(177)**
Terminated deferred	(150)	42	(42)	0	0	0	**(150)**
Terminated refund/transfer	(116)	(12)	(100)	0	0	0	**(228)**
Deaths	(7)	(2)	(2)	(16)	(9)	(6)	**(42)**
New beneficiary	0	0	0	0	0	0	**0**
Disabled	(17)	(3)	0	0	0	0	**(20)**
Data correction	(2)	(40)	2	(4)	0	17	**(27)**
Net change	(50)	144	(28)	158	13	15	**252**
Preliminary Members on 6/30/2012*	**4,272**	**1,179**	**473**	**1,779**	**243**	**180**	**8,126**
GRS Data Adjustment	4	1	0	(6)	1	0	0
Final Number as of 6/30/12	**4,276**	**1,180**	**473**	**1,773**	**244**	**180**	**8,126**

** Provided by MSRS and checked by GRS for reasonableness.*

Terminated Member Statistics	Deferred Retirement	Other Non-Vested	Total
Number	1,180	473	1,653
Average age	44.9	37.0	42.6
Average service	5.5	0.9	4.2
Average annual benefit, with augmentation to Normal Retirement Date and 30% CSA load	$11,626	N/A	$11,626
Average refund value, with 30% CSA load	$24,648	$3,493	$18,594

Development of Costs

Actuarial Valuation Balance Sheet *(Dollars in Thousands)*

The actuarial balance sheet is based on the principle that the long-term projected benefit obligations of the plan should be ideally equal to the long-term resources available to fund those obligations. The resources available to meet projected obligations for current members consist of current fund assets plus the present value of anticipated future contributions intended to fund benefits for current members. In the exhibit below, B.2 is the estimated present value of contributions to fund the normal cost rate for current members until their respective termination dates. Item B.1 is the present value of the total 20.70% statutory contribution net of normal cost and anticipated plan expenses during the period from the valuation date to the statutory unfunded amortization date.

The contributions made in excess of amounts required for current benefit payments are accumulated as a reserve to help meet benefit payments in later years. It is this reserve system which permits the establishment of a level rate of contribution each year.

		6/30/2012
A. Actuarial Value of Assets		$ 663,713
B. Expected Future Assets		
1. Present value of expected future statutory supplemental contributions		$ 155,304
2. Present value of future normal cost contributions		231,050
3. Total expected future assets: *(1.) + (2.)*		386,354
C. Total Current and Expected Future Assets		$ 1,050,067

D. Current Benefit Obligations*	Non-Vested	Vested	Total
1. Benefit recipients			
a. Service retirements	$ 0	$ 382,203	$ 382,203
b. Disability retirements	0	50,075	50,075
c. Survivors	0	24,217	24,217
2. Deferred retirements with augmentation	0	94,021	94,021
3. Former members without vested rights**	1,652	0	1,652
4. Active members	10,876	348,183	359,059
5. Total Current Benefit Obligations	$ 12,528	$ 898,699	$ 911,227

E. Expected Future Benefit Obligations	$ 287,989
F. Total Current and Expected Future Benefit Obligations***	$ 1,199,216
G. Unfunded Current Benefit Obligations: *(D.5.) - (A.)*	$ 247,514
H. Unfunded Current and Future Benefit Obligations: *(F.) - (C.)*	$ 149,149
I. Accrued Benefit Funding Ratio: *(A.)/(D.5.)*	72.84%
J. Projected Benefit Funding Ratio: *(C.)/(F.)*	87.56%

* *Present value of credited projected benefits (projected compensation, current service)*

** *Former members who have not satisfied vesting requirements and have not collected a refund of member contributions as of the valuation date*

*** *Present value of projected benefits (projected compensation, projected service)*

Development of Costs

Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate (*Dollars in Thousands)*

	Actuarial Present Value of Projected Benefits	Actuarial Present Value of Future Normal Costs	Actuarial Accrued Liability
A. Determination of Actuarial Accrued Liability (AAL)			
1. Active members			
a. Retirement annuities	$ 540,020	$ 157,296	$ 382,724
b. Disability benefits	52,799	30,598	22,201
c. Survivor's benefits	7,389	2,580	4,809
d. Deferred retirements	45,179	32,806	12,373
e. Refunds*	1,661	7,770	(6,109)
f. Total	$ 647,048	$ 231,050	$ 415,998
2. Deferred retirements with future augmentation	94,021	0	94,021
3. Former members without vested rights	1,652	0	1,652
4. Benefit recipients	456,495	0	456,495
5. Total	$1,199,216	$ 231,050	$ 968,166
B. Determination of Unfunded Actuarial Accrued Liability (UAAL)			
1. Actuarial accrued liability			$ 968,166
2. Current assets (AVA)			663,713
3. Unfunded actuarial accrued liability			$ 304,453
C. Determination of Supplemental Contribution Rate**			
1. Present value of future payrolls through the amortization date of June 30, 2038			$3,255,844
2. Supplemental contribution rate: *(B.3.) / (C.1.)*			9.35% ***

* *Includes non-vested refunds and non-married survivor benefits only.*

** *The amortization of the unfunded actuarial accrued liability (UAAL) using the current amortization method results in initial payments less than the "interest only" payment on the UAAL. Payments less than the interest only amount will result in the UAAL increasing for an initial period of time.*

*** *The amortization factor as of July 1, 2012 is 15.3537.*

Development of Costs

Changes in Unfunded Actuarial Accrued Liability (UAAL) *(Dollars in Thousands)*

	Year Ending 6/30/2012
A. Unfunded actuarial accrued liability at beginning of year	$ 269,985
B. Changes due to interest requirements and current rate of funding	
1. Normal cost and expenses	37,341
2. Contributions	(41,391)
3. Interest on A., B.1. and B.2.	22,777
4. Total *(B.1. + B.2. + B.3.)*	18,727
C. Expected unfunded actuarial accrued liability at end of year *(A. + B.4.)*	288,712
D. Increase (decrease) due to actuarial losses (gains) because of experience deviations from expected	
1. Age and Service Retirements	6,270
2. Disability Retirements	(1,206)
3. Death-in-Service Benefits	(42)
4. Withdrawals	(3,879)
5. Salary increases	3,055
6. Investment income	24,921
7. Mortality of annuitants	(1,058)
8. Other items	469
9. Total	28,530
E. Unfunded actuarial accrued liability at end of year before plan amendments and changes in actuarial assumptions *(C. + D.5.)*	317,242
F. Change in unfunded actuarial accrued liability due to changes in plan provisions	0
G. Change in unfunded actuarial accrued liability due to changes in actuarial assumptions	(8,295)
H. Change in unfunded actuarial accrued liability due to changes in actuarial asset method	(4,494)
I. Unfunded actuarial accrued liability at end of year *(E. + F. + G. + H.)**	$ 304,453

** The unfunded actuarial accrued liability on a market value of assets basis is $308,643.*

Development of Costs

Determination of Contribution Sufficiency/(Deficiency) *(Dollars in Thousands)*

The required contribution is defined in statutes as the sum of normal cost, a supplemental contribution to amortize the UAAL, and an allowance for expenses.

	Percent of Payroll	Dollar Amount
A. Statutory contributions - Chapter 352		
1. Employee contributions	8.60%	$ 18,237
2. Employer contributions	12.10%	25,659
3. Total	20.70%	$ 43,896
B. Required contributions - Chapter 356		
1. Normal cost		
a. Retirement benefits	10.91%	$ 23,135
b. Disability benefits	2.21%	4,686
c. Survivors	0.17%	360
d. Deferred retirement benefits	1.87%	3,965
e. Refunds*	0.50%	1,060
f. Total	15.66%	$ 33,206
Unfunded Actuarial Accrued Liability by June 30, 2038	9.35%	$ 19,827
3. Allowance for expenses	0.27%	573
4. Total	25.28% **	$ 53,606
C. Contribution Sufficiency/(Deficiency) *(A.3. - B.4.)*	(4.58%)	$ (9,710)

Note: Projected annual payroll for fiscal year beginning on the valuation date: $212,056.

* *Includes non-vested refunds and non-married survivor benefits only.*

** *The required contribution on a market value of assets basis is 25.41% of payroll.*

Actuarial Basis

Actuarial Methods

All actuarial methods are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement, or the MSRS Board of Directors. Different methodologies may also be reasonable and results based on other methodologies would be different.

Actuarial Cost Method

An actuarial cost method is a set of techniques used by the actuary to develop contribution levels under a retirement plan. The actuarial cost method used in this valuation for all purposes is the Entry Age Actuarial Cost Method. Under this method, a normal cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Age as of the valuation date was calculated based on the dates of birth provided by the Fund. Entry age for valuation purposes was calculated as the age on the valuation date minus the provided years of service on the valuation date.

To the extent that current assets and future normal costs do not support participants' expected future benefits, an unfunded actuarial accrued liability ("UAAL") develops. The UAAL is amortized over the statutory amortization period using level percent of payroll assuming payroll increases. The total contribution developed under this method is the sum of normal cost, expenses, and the payment toward the UAAL.

Select and Ultimate Discount Rate Methodology

Based on direction from the LCPR's actuary, the select and ultimate discount rate methodology was applied to the entry age normal results as follows:

1. The present value of projected benefits was calculated using the prescribed select and ultimate discount rates.
2. An equivalent single interest rate that produced approximately the same present value of projected benefits was determined.
3. The equivalent single interest rate was used to determine the entry age normal accrued liability and normal cost.

The equivalent single interest rate used in this valuation was 8.36%.

Funding Objective

The fundamental financing objective of the fund is to establish contribution rates which, when expressed as a percentage of active member payroll, will remain approximately level from generation to generation and meet the required deadline for full funding.

Decrement Timing

All decrements are assumed to occur mid-year.

Actuarial Basis

Actuarial Methods (Concluded)

Asset Valuation Method

The assets are valued based on a five-year moving average of expected and market values (five-year average actuarial value) determined as follows:

- At the end of each plan year, an average asset value is calculated as the average of the market asset value at the beginning and end of the fiscal year net of investment income for the fiscal year;
- The investment gain or (loss) is taken as the excess of actual investment income over the expected investment income based on the average asset value as calculated above;
- The investment gain or (loss) so determined is recognized over five years at 20% per year;
- The asset value is the sum of the market asset value plus the scheduled recognition of investment gains or (losses) during the current and the preceding four fiscal years.

The Minnesota Post Retirement Investment Fund (MPRIF) was dissolved on June 30, 2009. For the purpose of determining the actuarial value of assets, the MPRIF asset loss for the fiscal year ending June 30, 2009 is recognized incrementally over five years at 20% per year, similar to the smoothing described above. Prior to June 30, 2009, MPRIF asset gains and losses were not smoothed.

Payment on the Unfunded Actuarial Accrued Liability

Payment equals a level percentage of payroll each year to the statutory amortization date of June 30, 2038 assuming payroll increases of 3.75% per annum. If there is a negative Unfunded Actuarial Accrued Liability, the surplus amount is amortized over 30 years as a level percentage of payroll. If the unfunded liability increases due to changes in benefits, assumptions, or methods, the statutory amortization date will be re-determined. Projected payroll is multiplied by 0.959 in the determination of the present value of future payroll to account for timing differences (as required by the Standards for Actuarial Work).

Changes in Methods since Prior Valuation

Decrement timing was changed from beginning of year to mid-year.

Actuarial Basis

Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. All actuarial assumptions are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement (LCPR), or the MSRS Board of Directors. These parties are responsible for selecting the assumptions used for this valuation. The assumptions prescribed are based on the last experience study, dated February 2012, prepared by a former actuary.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment.

Investment return	Select and Ultimate Rates: July 1, 2012 to June 30, 2017 6.00% per annum post-retirement 8.00% per annum pre-retirement July 1, 2017 and later 6.50% per annum post-retirement 8.50% per annum pre-retirement
Benefit increases after retirement	Payment of 2.00% annual benefit increases after retirement are accounted for by using the 6.50% post-retirement assumption (6.00% during 5-year select period), as required by Minnesota Statute. Mathematically, this assumption funds a post-retirement benefit increase of 1.9% instead of 2.0%.
Salary increases	Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service.
Payroll growth	3.75% per year.
Mortality rates	
Healthy Pre-retirement	RP-2000 employee generational mortality table, white collar adjustment.
Healthy Post-retirement	RP-2000 annuitant generational mortality table, white collar adjustment, set forward one year for males and set back one year for females. The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50.
Disabled	RP-2000 disabled mortality table.
Retirement	Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year.
Withdrawal	Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are:

Year	Select Withdrawal Rates
1	20%
2	15%
3	8%

Actuarial Basis

Summary of Actuarial Assumptions (Continued)

Disability	Age-related rates based on experience; see table of sample rates. All incidences are assumed to be duty-related.
Allowance for combined service annuity	Liabilities for former members are increased by 30.00% to account for the effect of some participants having eligibility for a Combined Service Annuity.
Administrative expenses	Prior year administrative expenses expressed as percentage of prior year projected payroll.
Refund of contributions	All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit. Account balances for deferred members accumulate interest until normal retirement date and are discounted back to the valuation date.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 55.
Percentage married	85% of active members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Females are assumed to be three years younger than their male spouses.
Form of payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 10% elect 50% Joint & Survivor option 10% elect 75% Joint & Survivor option 40% elect 100% Joint & Survivor option Females: 10% elect 50% Joint & Survivor option 10% elect 75% Joint & Survivor option 30% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option. Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity, except that current terminated deferred members who terminated prior to July 1, 1997 are assumed to receive the Level Social Security option to age 62.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.
Decrement operation	Withdrawal decrements do not operate during retirement eligibility.
Service credit accruals	It is assumed that members accrue one year of service credit per year.

Actuarial Basis

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided. There are no members reported with missing gender or birth dates. In cases where submitted data was missing or incomplete, the following assumptions were applied: Data for active members: There were 6 members reported with missing salary and zero members reported with missing service; due to the small number of members with missing salary and/or service, and based on direction from MSRS, we made no adjustment to the reported data for active members. Data for terminated members: There were 110 members reported without a benefit. If available, we calculated benefits for these members using the reported Average Salary and credited service. If Average Salary was also not reported (94 members), we assumed a value of $30,000. If termination date was not reported (20 members), we assumed the member terminated at age 40 (or current age, if younger than age 40). There were no members reported without credited service. There were 37 members who terminated after June 30, 1997 and who were reported with a benefit in the Level Social Security option to age 62. Based on direction from MSRS, we adjusted benefits for these members to reflect the assumed life annuity election. Data for members receiving benefits: There were 11 members reported without a benefit, one beneficiary benefit had ceased as of the valuation date. Due to the small number of members with missing benefits, we made no adjustment to the reported data for members receiving benefits.

Actuarial Basis

Summary of Actuarial Assumptions (Continued)

Changes in actuarial assumptions

The investment return assumption was changed from 8.5% pre-retirement and 6.5% post-retirement to a select and ultimate approach with rates of 8.0% pre-retirement and 6.0% post-retirement for the period July 1, 2012 to June 30, 2017 and 8.5% pre-retirement and 6.5% post-retirement thereafter.

Healthy pre-retirement mortality was changed from 1983 Group Annuity Mortality set back five years for males and set back two years for females to RP-2000 employee generational mortality, white collar adjustment.

Healthy post-retirement mortality was changed from 1983 Group Annuity Mortality set back two years for males and set back one year for females to RP-2000 annuitant generational mortality, white collar adjustment, set forward one year for males and set back one year for females.

Disabled retired mortality was changed to RP-2000 disabled mortality. The previous table was based on the Combined Annuity Mortality table up to age 40, grading to healthy mortality for ages 60 and over.

The salary scale assumption was changed from an age related table to a service related table that generally reflects lower expected salary increases.

The payroll growth assumption was changed from 4.50% to 3.75%.

The form of benefit assumption for active married members was changed as follows:

Form of Payment	Male Assumption Last Year	Female Assumption Last Year	Male Assumption This Year	Female Assumption This Year
Straight Life Annuity	50%	90%	40%	50%
50% Joint & Survivor	25%	5%	10%	10%
75% Joint & Survivor	0%	0%	10%	10%
100% Joint & Survivor	25%	5%	40%	30%

Retirement, termination, and disability rates were adjusted to more closely reflect actual experience. Select termination rates were changed from 10% per year for the first three years of employment to 20%, 15%, and 8%, respectively.

Actuarial Basis

Summary of Actuarial Assumptions (Continued)

	Rate (%)			
	Healthy Pre-Retirement Mortality*		Post-Disability Mortality	
Age	**Male**	**Female**	**Male**	**Female**
20	0.03%	0.02%	2.26%	0.75%
25	0.04	0.02	2.26	0.75
30	0.04	0.03	2.26	0.75
35	0.06	0.05	2.26	0.75
40	0.09	0.06	2.26	0.75
45	0.13	0.10	2.26	0.75
50	0.20	0.16	2.90	1.15
55	0.27	0.24	3.54	1.65
60	0.43	0.38	4.20	2.18
65	0.67	0.59	5.02	2.80
70	0.98	0.88	6.26	3.76

* *These rates were adjusted for mortality improvements using projection scale AA.*

	Withdrawal Rates After Third Year		Disability Retirement	
Age	**Male**	**Female**	**Male**	**Female**
20	13.20%	8.80%	0.05%	0.05%
25	8.10	7.80	0.08	0.08
30	5.00	7.45	0.11	0.11
35	3.45	7.10	0.15	0.15
40	2.55	5.70	0.24	0.24
45	1.95	3.50	0.39	0.39
50	0.00	0.00	0.67	0.67
55	0.00	0.00	1.17	1.17
60	0.00	0.00	1.88	1.88
65	0.00	0.00	0.00	0.00

Actuarial Basis

Summary of Actuarial Assumptions (Concluded)

Age	Percent Retiring
50	5%
51	3
52	3
53	3
54	5
55	55
56	12
57	12
58	10
59	10
60	10
61	10
62	30
63	30
64	30
65	50
66	50
67	50
68	50
69	50
70+	100

Salary Scale	
Year	Increase
1	6.00%
2	5.85
3	5.70
4	5.55
5	5.40
6	5.25
7	5.10
8	4.95
9	4.80
10	4.65
11	4.55
12	4.45
13	4.35
14	4.25
15	4.15
16	4.05
17	3.95
18	3.85
19+	3.75

Actuarial Basis

Summary of Plan Provisions

Following is a summary of the major plan provisions used in the valuation of this report. MSRS is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

Plan year	July 1 through June 30
Eligibility	State employees in covered correctional service. Certain state employees with 75 percent working time spent in direct contact with inmates or patients are also eligible.
Contributions	**Member** / **Employer** Percent of Salary: 8.60% / 12.10% Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
Allowable service	Service during which member contributions were made. May also include certain leave of absence, military service and periods while temporary Worker's Compensation is paid.
Salary	Includes wages, allowances and fees. Excludes lump sum payments of separation and reduced salary while receiving Worker's Compensation benefits.
Average salary	Average of the five highest successive years of Salary. Average Salary is based on all Allowable Service if less than five years.
Vesting	Hired before July 1, 2010: 100% vested after 3 years of Allowable Service. Hired after June 30, 2010: 50% vested after 5 years of Allowable Service; 60% vested after 6 years of Allowable Service; 70% vested after 7 years of Allowable Service; 80% vested after 8 years of Allowable Service; 90% vested after 9 years of Allowable Service; 100% vested after 10 years of Allowable Service.

Retirement

Normal retirement benefit

Age/Service requirement	Age 55 and vested. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.
Amount	2.40% (2.20% if first hired after June 30, 2010) of Average Salary for each year of Allowable Service, pro-rata for completed months.

Early retirement

Age/Service requirement	Age 50 and vested.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date reduced by 2/10% (5/12% if first hired after June 30, 2010 or if hired before July 1, 2010 and retire after June 30, 2015) per month for each month that the member is under age 55.

Actuarial Basis

Summary of Plan Provisions (Continued)

Retirement (Continued)	
Form of payment	Life annuity. Actuarially equivalent options are: 50%, 75%, or 100% Joint and Survivor, or 15-year certain. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan.
Benefit increases	Benefit recipients receive future annual 2.0% benefit increases. If the accrued liability funding ratio reaches 90% (on a Market Value of Assets basis), the benefit increase will revert to 2.5%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase.
Disability	
Duty Disability	
Age/Service requirement	Physically or mentally unable to perform normal job duties as a direct result of a disability relating to an incident while performing the duties of the job. Members who become disabled after June 30, 2009 will have disability benefits converted to retirement benefits at age 55 instead of age 65.
Amount	50.00% of Average Salary plus 2.40% (2.20% if first hired after June 30, 2010) of Average Salary for each year in excess of 20 years and 10 months of Allowable Service (pro rata for completed months). Payment begins at disability and ends at age 55 (age 65 if disabled prior to July 1, 2009) or the five-year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. Member is reclassified from disabled to retired at age 55 (age 65 if disabled prior to July 1, 2009). Optional amount continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option.
Regular Disability	
Age/Service requirement	At least one year of covered Correctional service for employees hired before July 1, 2009, or a vested Correctional employee hired after June 30, 2009, and the employee is determined to have a regular disability not related to an incident while performing the duties of the job.

Actuarial Basis

Summary of Plan Provisions (Continued)

Disability (Continued)	
Amount	Normal retirement benefit based on covered Correctional Service (minimum of 15 years if hired prior to July 1, 2009) and Average Salary at disability. Payment begins at disability and ends at age 55 (age 65 if disabled prior to July 1, 2009) or the five-year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. Member is reclassified from disabled to retired at age 55 (age 65 if disabled prior to July 1, 2009). Optional amount continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option.
Benefit Increases	Same as for retirement.
Death	
Surviving spouse benefit	
Age/Service requirement	Member at any age or former member age 50 or older who dies before retirement or disability benefit commences and was vested. If a former member dies before age 55 and has less than 30 years of Allowable Service, benefits commence when the former member would have been age 55. If an active member dies, benefits may commence immediately, regardless of age.
Amount	Surviving spouse receives the 100% joint and survivor benefits using the Normal Retirement formula above. If commencement is prior to age 55, the appropriate early retirement formula described above applies except that one-half the monthly reduction factor is used from age 50 to the commencement age and the Rule of 90 does not apply. In lieu of this benefit, the surviving spouse may elect a refund of member contributions with interest or an actuarially equivalent term certain annuity (lump sum payable to estate at death).
Benefit increases	Same as for retirement.
Surviving dependent children's benefit	
Age/service requirement	If no surviving spouse, all dependent children (biological or adopted) below age 20 who are dependent for more than half of their support on deceased member.
Amount	Actuarially equivalent to surviving spouse 100% joint and survivor annuity payable to the later of age 20 or five years. The amount is to be proportionally divided among surviving children.
Benefit increases	Same as for retirement.
Refund of contributions with interest	
Age/service requirement	Active employee dies and survivor benefits are not payable or a former employee dies before annuity begins. If accumulated member contributions with interest exceed total payments to the surviving spouse and children, then the remainder is paid out.

Actuarial Basis

Summary of Plan Provisions (Concluded)

Death (Continued) Amount	Member's contributions with 6.00% interest compounded daily until July 1, 2011 and 4.00% thereafter.
Termination Refund of contributions Age/Service requirement	Termination of state service.
Amount	Member's contributions with 6.00% interest through June 30, 2011 compounded daily. Beginning July 1, 2011 a member's contributions will increase at 4.00% interest compounded daily. If a member is vested, a deferred annuity may be elected in lieu of a refund.
Deferred benefit Age/service requirement	Partially or fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1 of the year following attainment of age 55 or January 1, 2012, whichever is earlier; and (d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012; (e.) 2.00% from January 1, 2012 thereafter. Amount is payable at normal or early retirement.
Optional form conversion factors	Actuarially equivalent factors based on the 1983 Group Annuity Mortality, blended 75% male and 25% female (set forward two years), and 6% interest.
Combined service annuity	Members are eligible for combined service benefits if they: (a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement; (b.) Have at least six months of allowable service credit in each plan worked under; and (c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year. Members who meet the above requirements must have their benefit based on the following: (a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement. (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Changes in plan provisions	None.

Plan Accounting Under GASB No. 25 (as amended by GASB No. 50)

Provided below is information required under GASB Statement No. 25 as amended by GASB Statement No. 50 - Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans as amended by GASB Statement No. 50.

Schedule of Funding Progress[1] *(Dollars in Thousands)*

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (a)/(b)	Actual Covered Payroll (Previous FY) (c)	UAAL as Percentag of Covere Payroll [(b)-(a)]/(
7-1-1991	$ 105,925	$ 112,171	$ 6,246	94.43%	$ 43,429	14.38
7-1-1992	121,051	123,515	2,464	98.01	47,592	5.18
7-1-1993	135,939	134,280	(1,659)	101.24	52,122	(3.18)
7-1-1994	148,163	152,702	4,539	97.03	54,673	8.30
7-1-1995	165,427	153,491	(11,936)	107.78	66,939	(17.83)
7-1-1996	193,833	170,959	(22,874)	113.38	72,959	(31.35)
7-1-1997	241,916	212,638	(29,278)	113.77	112,408	(26.05)
7-1-1998	295,291	261,869	(33,422)	112.76	105,796	(31.59)
7-1-1999	335,408	307,408	(28,000)	109.11	106,131	(26.38)
7-1-2000	386,964	359,885	(27,079)	107.52	112,587	(24.05)
7-1-2001	431,134	398,633	(32,501)	108.15	120,947	(26.87)
7-1-2002	457,416	446,426	(10,990)	102.46	124,373	(8.84)
7-1-2003	470,716	484,974	14,258	97.06	131,328	10.86
7-1-2004	486,617	524,215	37,598	92.83	133,172	28.23
7-1-2005	503,573	546,118	42,545 [2]	92.21	132,335	32.15
7-1-2006	535,357	647,480	112,123	82.68	145,879	76.86
7-1-2007	559,852	708,292	148,440	79.04	167,727	88.50
7-1-2008	572,719	760,363	187,644	75.32	194,391	96.53
7-1-2009	590,399	821,250	230,851	71.89	193,445	119.34
7-1-2010	603,863	851,086	247,223	70.95	192,450	128.46
7-1-2011	637,027	907,012	269,985	70.23	197,702	136.56
7-1-2012	663,713	968,166	304,453	68.55	200,035 [3]	152.20

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*

[2] *Provided by MSRS instead of prior actuary.*

[3] *Assumed equal to actual member contributions divided by 8.60%.*

Plan Accounting Under GASB No. 25 (as amended by GASB N. 50)

Schedule of Contributions from the Employer and Other Contributing Entities[1]

(Dollars in Thousands)

The GASB Statement No. 25 required and actual contributions are as follows:

Plan Year Ended June 30	Actuarially Required Contribution Rate (a)	Actual Covered Payroll (b)	Actual Member Contributions (c)	Annual Required Contributions [(a)x(b)] - (c) = (d)	Actual Employer Contributions (e)	Percentage Contributed (e)/(d)
1991	10.73%	$ 43,429	$ 2,128	$ 2,532	$ 2,731	107.86%
1992	10.82	47,592	2,332	2,817	2,955	104.90
1993	11.41	52,122	2,554	3,393	3,217	94.81
1994	10.97	54,673	2,679	3,319	3,355	101.08
1995	11.30	66,939	3,280	4,284	4,195	97.92
1996	11.11	72,959	3,575	4,531	4,559	100.62
1997	11.21	112,408	5,508	7,093	9,129	128.70
1998	12.49	105,796	5,954	7,260	8,146	112.20
1999	12.99	106,131	6,378	7,408	8,172	110.31
2000	13.66	112,587	6,526	8,853	8,984	101.48
2001	13.72	120,947	6,996	9,598	9,652	100.56
2002	13.81	124,373	7,207	9,969	9,925	99.56
2003	14.73	131,328	7,610	11,735	10,480	89.31
2004	15.83	133,172	7,748	13,333	10,627	79.71
2005	17.48	132,335	7,943	15,189	11,016	72.52
2006	17.71	145,879	8,964	16,871	12,152	72.03
2007	23.34	167,727	10,032	29,115	13,927	47.83
2008	24.44	194,391	12,775	34,734	18,623	53.62
2009	23.66	193,445	14,031	31,738	20,126	63.41
2010	24.85	192,450	15,267	32,557	21,988	67.54
2011	25.43	197,702	17,002	33,274	23,892	71.80
2012	26.00	200,035 [2]	17,203	34,806	24,188	69.49
2013	25.28	N/A	N/A	N/A	N/A	N/A

[1] *Information prior to 2012 provided by prior actuary. See prior reports for additional detail.*
[2] *Assumed equal to actual member contributions divided by 8.60%.*

Glossary of Terms

Accrued Benefit Funding Ratio	The ratio of assets to Current Benefit Obligations.
Accrued Liability Funding Ratio	The ratio of assets to Actuarial Accrued Liability.
Actuarial Accrued Liability (AAL)	The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs.
Actuarial Assumptions	Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items.
Actuarial Cost Method	A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability.
Actuarial Equivalent	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV)	The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made.
Actuarial Present Value of Projected Benefits	The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB No. 25, such as the Funded Ratio and the Annual Required Contribution (ARC).

Glossary of Terms (Continued)

Actuarial Value of Assets	The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC).
Amortization Method	A method for determining the Amortization Payment. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. The stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase.
Amortization Payment	That portion of the plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Amortization Period	The period used in calculating the Amortization Payment.
Annual Required Contribution (ARC)	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under GASB No. 25. The ARC consists of the Employer Normal Cost and Amortization Payment.
Augmentation	Annual increases to deferred benefits.
Closed Amortization Period	A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc.
Current Benefit Obligations	The present value of benefits earned to the valuation date, based on current service and including future salary increases to retirement.
Employer Normal Cost	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Expected Assets	The present value of anticipated future contributions intended to fund benefits for current members.

Glossary of Terms (Concluded)

Experience Gain/Loss	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two actuarial valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected.
GASB	Governmental Accounting Standards Board.
GASB No. 25 and GASB No. 27	These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves.
GASB No. 50	The accounting standard governing a state or local governmental employer's accounting for pensions.
Normal Cost	The annual cost assigned, under the Actuarial Cost Method, to the current plan year.
Projected Benefit Funding Ratio	The ratio of the sum of Actuarial Value of Assets and Expected Assets to the Actuarial Present Value of Projected Benefits.
Unfunded Actuarial Accrued Liability	The difference between the Actuarial Accrued Liability and Actuarial Value of Assets.
Valuation Date	The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date.