GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM
CORRECTIONAL EMPLOYEES RETIREMENT FUND
ACTUARIAL VALUATION REPORT AS OF JULY 1, 2013

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November 27, 2013

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

Dear Board of Directors:

The results of the July 1, 2013 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 Board and staff 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, 2013, 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. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

This report should not be relied on for any purpose other than the purpose described herein. 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.

Brian B. Murphy and Bonita J. Wurst 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.

Based on the current statutory contributions, the unfunded liability will not be eliminated if all actuarial assumptions are met.

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

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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, 2013	Actuarial Valuation as of July 1, 2012
Statutory Contributions - Chapter 352.92 (% of Payroll)	20.70%	20.70%
Required Contributions - Chapter 356 (% of Payroll)	26.11%	25.28%
Sufficiency / (Deficiency)	(5.41)%	(4.58)%

The contribution deficiency increased from (4.58%)% of payroll to (5.41%)% of payroll. The primary reason for the increased contribution deficiency is the recognition of investment losses from prior years in the actuarial value of assets. Lower than expected salaries resulted in a liability gain but also increased the payment on the unfunded actuarial accrued liability as a percent of payroll. 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 25 years. Based on the current member and employer contribution rates and other methods and assumptions described in this report, the unfunded liability will never be eliminated. Furthermore, based on current contributions, the payment on the unfunded liability as a percent of pay will increase without limit to an infinite value.

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 14.1% for the plan year ending June 30, 2013. The AVA earned approximately 6.4% for the plan year ending June 30, 2013 as compared to the assumed rate of 8.0%. This assumed rate is a prescribed assumption 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). Statements No. 67 and No. 68 issued in June 2012, replace Statements No. 25 and No. 27, respectively. Statement No. 68, effective for the fiscal year beginning July 1, 2014, sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67, effective for the fiscal year beginning July 1, 2013, sets rules for the systems themselves. Accounting information prepared according to Statements No. 67 and No. 68 will be provided in a separate report beginning with the July 1, 2014 valuation.

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, 2013	**July 1, 2012**
Contributions (*% of Payroll*)		
Statutory - Chapter 352	20.70%	20.70%
Required - Chapter 356	26.11%	25.28%
Sufficiency / (Deficiency)	(5.41)%	(4.58)%
Funding Ratios (*dollars in thousands*)		
Assets		
- Current assets (AVA)	$ 701,091	$ 663,713
- Current assets (MVA)	747,157	659,523
Accrued Benefit Funding Ratio		
- Current benefit obligations	$ 977,652	$ 911,227
- Funding ratio (AVA)	71.71%	72.84%
- Funding ratio (MVA)	76.42%	72.38%
Accrued Liability Funding Ratio		
- Actuarial accrued liability	$ 1,026,098	$ 968,166
- Funding ratio (AVA)	68.33%	68.55%
- Funding ratio (MVA)	72.82%	68.12%
Projected Benefit Funding Ratio		
- Current and expected future assets	$ 1,083,641	$ 1,050,067
- Current and expected future benefit obligations	1,256,425	1,199,216
- Projected benefit funding ratio (AVA)	86.25%	87.56%
Participant Data		
Active members		
- Number	4,384	4,276
- Projected annual earnings *(000s)*	212,972	212,056
- Average projected annual earnings	48,579	49,592
- Average age	41.5	41.6
- Average service	8.8	8.7
Service retirements	1,920	1,773
Survivors	196	180
Disability retirements	258	244
Deferred retirements	1,196	1,180
Terminated other non-vested	413	473
Total	**8,367**	**8,126**

Summary of Valuation Results

Valuation of Future Annual Post-Retirement Benefit Increases

A very important assumption affecting the valuation results is the expectation of future annual 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 72.8%. 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.

We performed a projection of liabilities and assets, using the 2013 valuation results as a baseline and assuming future experience follows the valuation assumptions (including future investment returns of 8.0% for four years and 8.5% thereafter). In addition, the projection utilized the following methods and assumptions:

- Liabilities and normal cost assume future annual benefit increases at 2.5% level payable for all years.
- Cash flow assuming future annual benefit increases at current 2.0% level.
- Level normal cost as a percent of pay (assuming total payroll increases as assumed in the valuation for purposes of amortizing the unfunded liability).
- Current statutory contribution levels (i.e., not including potential contribution increases under the contribution stabilizer statutes).

Based on these assumptions and methods, the projection indicates that the funded status of this plan is not expected to reach 90% within the next 15 years of the projection. 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 $1,091 million instead of $1,026 million, resulting in a funded ratio of 68.5% (on a market value basis) as of July 1, 2013.

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 Fiduciary Net Position *(Dollars in Thousands)*

	Market Value	
Assets	**June 30, 2013**	**June 30, 2012**
Cash, equivalents, short term securities	$ 20,772	$ 15,273
Fixed income	171,241	146,439
Equity	554,719	497,802
Other*	72,738	59,745
Total cash, investments, and other assets	$ 819,470	$ 719,259
Amounts Receivable	1,346	1,295
Total Assets	$ 820,816	$ 720,554
Amounts Payable*	(73,659)	(61,031)
Net Position Restricted for Pensions	$ 747,157	$ 659,523

** Includes $72,738 in Securities Lending Collateral as of June 30, 2013 and $59,745 as of June 30, 2012.*

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 prior two fiscal years.

Change in Assets	**Market Value**	
Year Ending	**June 30, 2013**	**June 30, 2012**
1. Fund balance at market value at beginning of year	**$ 659,523**	**$ 646,582**
2. Contributions		
a. Member	17,561	17,203
b. Employer	24,632	24,188
c. Other sources	0	0
d. Total contributions	$ 42,193	$ 41,391
3. Investment income		
a. Investment income/(loss)	94,414	16,822
b. Investment expenses	(1,022)	(896)
c. Net investment income/(loss)	93,392	15,926
4. Other	0	0
5. Total income: *(2.d.) + (3.c.) + (4.)*	**$ 135,585**	**$ 57,317**
6. Benefits Paid		
a. Annuity benefits	(46,226)	(42,571)
b. Refunds	(1,032)	(1,257)
c. Total benefits paid	(47,258)	(43,828)
7. Expenses		
a. Other	(1)	0
b. Administrative	(692)	(548)
c. Total expenses	(693)	(548)
8. Total disbursements: *(6.c.) + (7.c.)*	**(47,951)**	**(44,376)**
9. Fund balance at market value at end of year: *(1.) + (5.) + (8.)*	**$ 747,157**	**$ 659,523**
10. Approximate return on market value of assets	14.1%	2.4%

Plan Assets

Actuarial Asset Value *(Dollars in Thousands)*

		June 30, 2013		June 30, 2012	
1. Market value of assets available for benefits			**$ 747,157**		**$ 659,523**
2. Determination of average balance					
a. Total assets available at beginning of year			659,523		646,582
b. Total assets available at end of year			747,157		659,523
c. Net investment income for fiscal year			93,392		15,926
d. Average balance *[a. + b. - c.] / 2*			656,644		645,090
3. Expected return* *[8.0% x 2.d.] (8.5% in 2012)*			52,532		54,833
4. Actual return			93,392		15,926
5. Current year asset gain/(loss) *[4. - 3.]*			40,860		(38,907)
6. Unrecognized asset returns					
	Original	**Unrecognized Amount**		**Unrecognized Amount**	
	Amount	**%**	**Dollar**	**%**	**Dollar**
a. Year ended June 30, 2013	$ 40,860	80%	$ 32,688		N/A
b. Year ended June 30, 2012	(38,907)	60%	(23,344)	80%	$ (31,126)
c. Year ended June 30, 2011	76,770	40%	30,708	60%	46,062
d. Year ended June 30, 2010	30,070	20%	6,014	40%	12,028
e. Year ended June 30, 2009	(155,770)		N/A	20%	(31,154)
f. Unrecognized return adjustment			**$ 46,066**		**$ (4,190)**
7. **Actuarial value at end of year** *(1. - 6.f.)*			**$ 701,091**		**$ 663,713**
8. Approximate return on actuarial value of assets during fiscal			6.4%		4.6%
9. Ratio of actuarial value of assets to market value of assets			0.94		1.01

** The expected return is 8.5% prior to fiscal year 2013; beginning with fiscal year 2013, the expected return is 8.0%.*

Membership Data

Distribution of Active Members

	Years of Service as of June 30, 2013									
Age	**<3***	**3 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35+**	**Total**
< 25	106		1							**107**
Avg. Earnings	27,641		32,009							**27,682**
25 - 29	347	85	109							**541**
Avg. Earnings	33,968	39,865	40,967							**36,305**
30 - 34	216	84	382	39						**721**
Avg. Earnings	36,056	41,926	42,960	48,329						**41,061**
35 - 39	117	51	267	143	20					**598**
Avg. Earnings	37,686	41,258	44,319	50,919	58,481					**44,812**
40 - 44	87	36	194	134	119	8				**578**
Avg. Earnings	36,366	41,512	45,999	50,296	58,147	61,628				**47,983**
45 - 49	89	50	154	122	137	82	15	1		**650**
Avg. Earnings	36,040	43,120	46,828	50,663	57,153	60,591	64,916	71,449		**50,153**
50 - 54	74	39	177	113	113	102	75	14		**707**
Avg. Earnings	40,133	42,902	51,100	53,566	57,143	59,725	64,351	61,943		**53,725**
55 - 59	31	27	120	66	59	19	6	17	2	**347**
Avg. Earnings	44,640	51,486	53,705	54,783	54,237	58,773	70,401	63,695	69,055	**54,162**
60 - 64	9	10	39	25	20	5	1	3		**112**
Avg. Earnings	54,122	50,173	50,213	63,355	53,268	62,372	54,569	41,905		**54,362**
65 - 69	3		8	4	2			1		**18**
Avg. Earnings	38,671		60,341	56,525	92,792			59,332		**59,431**
70+		1	3	1						**5**
Avg. Earnings		60,475	21,164	67,635						**38,320**
Total	**1,079**	**383**	**1,454**	**647**	**470**	**216**	**97**	**36**	**2**	**4,384**
Avg. Earnings	**35,442**	**42,534**	**45,991**	**51,983**	**57,079**	**60,102**	**64,711**	**61,292**	**69,055**	**46,411**

* *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, 2013							
Age	**<1**	**1 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25+**	**Total**
<50								
Avg. Benefit								
50 - 54	27	49		1				**77**
Avg. Benefit	19,149	22,700		3,630				**21,207**
55 - 59	104	279	52		1			**436**
Avg. Benefit	24,636	24,621	25,442		25,669			**24,725**
60 - 64	29	120	335	37				**521**
Avg. Benefit	15,839	18,763	22,941	19,173				**21,316**
65 - 69	16	81	86	263	10			**456**
Avg. Benefit	9,623	8,964	12,356	19,003	21,411			**15,690**
70 - 74	4	12	43	61	83	1		**204**
Avg. Benefit	8,747	10,703	10,235	19,288	25,534	28,655		**19,255**
75 - 79	1	2	8	31	41	40		**123**
Avg. Benefit	11,680	21,756	22,521	18,773	22,541	29,402		**23,720**
80 - 84				5	7	18	28	**58**
Avg. Benefit				8,115	19,025	25,489	24,060	**22,521**
85 - 89						4	27	**31**
Avg. Benefit						13,951	30,899	**28,712**
90+							14	**14**
Avg. Benefit							21,510	**21,510**
Total	**181**	**543**	**524**	**398**	**142**	**63**	**69**	**1,920**
Avg. Benefit	**20,658**	**20,499**	**20,403**	**18,869**	**24,060**	**27,291**	**26,219**	**20,842**

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.

Membership Data

Distribution of Survivors

	Years Since Death as of June 30, 2013							
Age	**<1**	**1 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25+**	**Total**
<45	5	7	1	2				**15**
Avg. Benefit	8,583	6,600	3,757	4,757				**6,826**
45 - 49	3	2	4	1				**10**
Avg. Benefit	6,950	12,097	6,568	16,188				**8,750**
50 - 54	4	6	4	2	1			**17**
Avg. Benefit	17,508	6,919	12,178	7,340	15,058			**11,176**
55 - 59	3	18	11	5	2			**39**
Avg. Benefit	5,675	14,867	16,288	7,799	6,684			**13,235**
60 - 64	1	5	10	9	2	1		**28**
Avg. Benefit	18,159	8,107	12,295	13,252	2,802	9,242		**11,277**
65 - 69	1	12	12	4	4			**33**
Avg. Benefit	16,048	14,794	14,680	11,755	13,479			**14,263**
70 - 74	1	5	3	4	2	1	1	**17**
Avg. Benefit	22,413	17,891	16,264	23,603	19,706	9,552	6,524	**18,268**
75 - 79		3	6	4	2			**15**
Avg. Benefit		28,229	19,571	15,934	11,844			**19,303**
80 - 84	2	3	1	1	1	1	2	**11**
Avg. Benefit	30,480	14,605	6,884	12,592	8,311	13,248	13,739	**15,754**
85 - 89	2	1	1	1	1			**6**
Avg. Benefit	12,182	15,349	10,824	15,414	27,997			**15,658**
90+		1			1		3	**5**
Avg. Benefit		11,556			1,707		8,636	**7,834**
Total	**22**	**63**	**53**	**33**	**16**	**3**	**6**	**196**
Avg. Benefit	**13,308**	**13,372**	**13,980**	**13,085**	**11,816**	**10,680**	**9,985**	**13,209**

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.

Membership Data

Distribution of Disability Retirements

	Years Disabled as of June 30, 2013							
Age	**<1**	**1 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25+**	**Total**
< 45	4	16	10	10	1			**41**
Avg. Benefit	13,015	16,682	14,920	18,365	12,726			**16,209**
45 - 49	4	6	12	6	1			**29**
Avg. Benefit	15,426	18,400	19,543	18,138	17,773			**18,387**
50 - 54	2	15	14	10	5	1		**47**
Avg. Benefit	15,005	21,171	17,717	19,985	20,844	17,262		**19,509**
55 - 59	1	22	15	13	7			**58**
Avg. Benefit	10,828	17,366	19,326	22,589	16,847			**18,868**
60 - 64	2	8	15	16	7	1		**49**
Avg. Benefit	17,687	16,890	19,222	19,488	19,849	28,490		**19,144**
65 - 69		6	3	12	4			**25**
Avg. Benefit		17,047	22,569	15,109	17,019			**16,775**
70 - 74			3	1	1	1		**6**
Avg. Benefit			17,090	35,430	37,392	19,508		**23,933**
75+				1		1	1	**3**
Avg. Benefit				19,694		20,814	24,760	**21,756**
Total	**13**	**73**	**72**	**69**	**26**	**4**	**1**	**258**
Avg. Benefit	**14,613**	**18,005**	**18,458**	**19,337**	**19,118**	**21,518**	**24,760**	**18,509**

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.

Membership Data

Reconciliation of Members*

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2012	**4,276**	**1,180**	**473**	**1,773**	**244**	**180**	**8,126**
New members	447	0	0	0	0	0	**447**
Return to active	37	(26)	(11)	0	0	0	**0**
Terminated non-vested	(85)	0	85	0	0	0	**0**
Service retirements	(129)	(42)	0	171	0	0	**0**
Terminated deferred	(90)	90	0	0	0	0	**0**
Terminated refund/transfer	(55)	(16)	(146)	0	0	0	**(217)**
Deaths	(3)	(1)	0	(27)	(4)	(4)	**(39)**
New beneficiary	0	0	0	0	0	22	**22**
Disabled	(14)	0	0	0	14	0	**0**
Data correction	0	11	12	3	4	(2)	**28**
Net change	108	16	(60)	147	14	16	**241**
Members on 6/30/2013	**4,384**	**1,196**	**413**	**1,920**	**258**	**196**	**8,367**

Terminated Member Statistics	Deferred Retirement	Other Non-Vested	Total
Number	1,196	413	1,609
Average age	45.0	37.2	43.0
Average service	5.5	1.0	4.3
Average annual benefit, with augmentation to Normal Retirement Date and 30% CSA load	$ 12,069	N/A	$12,069
Average refund value, with 30% CSA load	$ 25,617	$ 4,025	$20,075

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.

	Non-Vested	Vested	June 30, 2013
A. Actuarial Value of Assets			$ 701,091
B. Expected Future Assets			
1. Present value of expected future statutory supplemental contributions			$ 152,223
2. Present value of future normal cost contributions			230,327
3. Total expected future assets: *(1.) + (2.)*			382,550
C. Total Current and Expected Future Assets			$ 1,083,641
D. Current Benefit Obligations*			
1. Benefit recipients	**Non-Vested**	**Vested**	**Total**
a. Service retirements	$ 0	$ 418,891	$ 418,891
b. Disability retirements	0	53,120	53,120
c. Survivors	0	26,707	26,707
2. Deferred retirements with augmentation	0	96,189	96,189
3. Former members without vested rights**	865	0	865
4. Active members	10,256	371,624	381,880
5. Total Current Benefit Obligations	$ 11,121	$ 966,531	$ 977,652
E. Expected Future Benefit Obligations			$ 278,773
F. Total Current and Expected Future Benefit Obligations***			$ 1,256,425
G. Unfunded Current Benefit Obligations: *(D.5.) - (A.)*			$ 276,561
H. Unfunded Current and Future Benefit Obligations: *(F.) - (C.)*			$ 172,784
I. Accrued Benefit Funding Ratio: *(A.)/(D.5.)*			71.71%
J. Projected Benefit Funding Ratio: *(C.)/(F.)*			86.25%

* *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	$ 552,719	$ 157,097	$ 395,622
b. Disability benefits	52,840	30,202	22,638
c. Survivor's benefits	7,658	2,610	5,048
d. Deferred retirements	45,405	32,490	12,915
e. Refunds*	2,031	7,928	(5,897)
f. Total	$ 660,653	$ 230,327	$ 430,326
2. Deferred retirements with future augmentation	96,189	0	96,189
3. Former members without vested rights	865	0	865
4. Benefit recipients	498,718	0	498,718
5. Total	$1,256,425	$ 230,327	$ 1,026,098
B. Determination of Unfunded Actuarial Accrued Liability (UAAL)			
1. Actuarial accrued liability			$ 1,026,098
2. Current assets (AVA)			701,091
3. Unfunded actuarial accrued liability			$ 325,007
C. Determination of Supplemental Contribution Rate**			
1. Present value of future payrolls through the amortization date of June 30, 2038			$3,191,249
2. Supplemental contribution rate: *(B.3.) / (C.1.)*			10.18% ***

* *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, 2013 is 14.98436.*

Development of Costs

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

	Year Ending June 30, 2013		
	Actuarial Accrued Liability	Current Assets	Unfunded Actuarial Accrued Liability
A. Unfunded actuarial accrued liability at beginning of year	$ 968,166	$ 663,713	$ 304,453
B. Changes due to interest requirements and current rate of funding			
1. Normal cost and expenses	$ 33,898	$ 0	$ 33,898
2. Benefit payments	(47,258)	(47,258)	0
3. Contributions	0	42,193	(42,193)
4. Interest on A., B.1., B.2. and B.3.	80,380	52,894	27,486
5. Total *(B.1. + B.2. + B.3. + B.4.)*	67,020	47,829	19,191
C. Expected unfunded actuarial accrued liability at end of year *(A. + B.5.)*			$ 323,644
D. Increase (decrease) due to actuarial losses (gains) because of experience deviations from expected			
1. Age and Service retirements			$ 718
2. Disability retirements			(726)
3. Death-in-Service benefits			(385)
4. Withdrawals			17
5. Salary increases			(15,955)
6. Investment income			10,451
7. Mortality of annuitants			1,224
8. Other items			6,019
9. Total			$ 1,363
E. Unfunded actuarial accrued liability at end of year before plan amendments and changes in actuarial assumptions *(C. + D.9.)*			$ 325,007
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			0
H. Change in unfunded actuarial accrued liability due to changes in actuarial methods			0
I. Unfunded actuarial accrued liability at end of year *(E. + F. + G. + H.)**			$ 325,007

** The unfunded actuarial accrued liability on a market value of assets basis is $278,941.*

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%	$ 18,316
2. Employer contributions	12.10%	25,770
3. Total	20.70%	$ 44,086
B. Required contributions - Chapter 356		
1. Normal cost		
a. Retirement benefits	10.87%	$ 23,150
b. Disability benefits	2.19%	4,664
c. Survivors	0.18%	383
d. Deferred retirement benefits	1.85%	3,940
e. Refunds*	0.51%	1,086
f. Total	15.60%	$ 33,223
2. Supplemental contribution amortization of Unfunded Actuarial Accrued Liability by June 30, 2038	10.18%	$ 21,681
3. Allowance for expenses	0.33%	703
4. Total	26.11% **	$ 55,607
C. Contribution sufficiency/(deficiency) *(A.3. - B.4.)*	(5.41%)	$ (11,521)

Note: Projected annual payroll for fiscal year beginning on the valuation date: $212,972.

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

** *The required contribution on a market value of assets basis is 24.67% 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 8.39% (8.36% last year).

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-fiscal 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 was 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

None.

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, 2013 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 4-year select period), as required by Minnesota Statute. Mathematically, this assumption funds a post-retirement benefit increase of 1.9% instead of 2.0%. This valuation does not reflect any additional benefit increases if the plan's funding ratio exceeds 90%.
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.
Inflation	3.00% per year.
Mortality rates	
Healthy Pre-retirement	RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment.
Healthy Post-retirement	RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, 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 120. 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	Account balances accumulate interest until normal retirement date and are discounted back to the valuation date. 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.
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 nearest whole year 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: <u>Data for active members</u>: There were five members reported with zero or invalid salary. We used prior year salary (five members). There were zero members reported with missing service. <u>Data for terminated members</u>: There were 112 members reported without a benefit. If available, we calculated benefits for these members using the reported Average Salary, Credited Service and Termination Date. If Average Salary was also not reported (98 members), we assumed a value of $30,000. If termination date was not reported (six 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 59 members who terminated after June 30, 1997 and who were reported with a benefit in the Accelerated to Age 62 option. Based on direction from MSRS, we adjusted benefits for these members to reflect the assumed life annuity election. <u>Data for members receiving benefits</u>: There were no members reported without a benefit. There were no survivors reported with an expired benefit. There were 42 retirees reported with a bounceback annuity but were not reported with a reasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively.
Changes in actuarial assumptions	None.

Actuarial Basis

Summary of Actuarial Assumptions (Continued)

	Rate (%)*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality	
Age	Male	Female	Male	Female	Male	Female
20	0.04%	0.02%	0.03%	0.02%	2.26%	0.75%
25	0.04	0.02	0.04	0.02	2.26	0.75
30	0.04	0.02	0.04	0.03	2.26	0.75
35	0.06	0.04	0.06	0.05	2.26	0.75
40	0.10	0.06	0.09	0.06	2.26	0.75
45	0.15	0.09	0.13	0.10	2.26	0.75
50	0.60	0.15	0.20	0.16	2.90	1.15
55	0.54	0.32	0.27	0.24	3.54	1.65
60	0.73	0.51	0.43	0.38	4.20	2.18
65	1.30	0.82	0.67	0.59	5.02	2.80
70	2.14	1.37	0.98	0.88	6.26	3.76

* *Generally, mortality rates are expected to increase as age increases. Due to the combination of pre-retirement rates, post-retirement rates, the white collar adjustment, and Projection Scale AA, the prescribed mortality tables have a few ages where assumed mortality decreases slightly instead of increases. We have used the rates as prescribed, but note that the prescribed assumption may not be reasonable at every age. If the rates were reasonably adjusted so that they decreased at all ages, we would not expect the valuation results to be materially different.*

** *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 which present inherent dangers to the employee. 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 RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, set forward one year for males and set back one year for females, blended 70% males, and 6.5% 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 a Percentage of Covered Payroll [(b)-(a)]/(c)
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
7-1-2013	701,091	1,026,098	325,007	68.33	204,198 [3]	159.16

[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 No. 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	204,198 [2]	17,561	34,060	24,632	72.32
2014	26.11	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.
GASB No. 67 and GASB No. 68	Statements No. 67 and No. 68, issued in June 2012, replace the requirements of Statements No. 25 and No. 27, respectively. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves. Accounting information prepared according to Statements No. 67 and No. 68 will be provided in a separate report beginning with the July 1, 2014 valuation.
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 is determined. The benefits expected to be paid in the future are discounted to this date.