GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

STATE EMPLOYEES RETIREMENT FUND

GASB STATEMENT NOS. 67 AND 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2015

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

November 30, 2015

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

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the State Employees Retirement Fund ("SERF"). These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing financial reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. MSRS is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the Minnesota State Retirement System (MSRS) only in its entirety and only with the permission of MSRS.

This report is based upon information, furnished to us by MSRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not otherwise audited.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the State Employees Retirement Fund as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

By Bonita J. Wurst
Bonita J. Wurst
ASA, EA, MAAA

By Brian B Murphy
Brian B. Murphy
FSA, EA, FCA, MAAA

OTHER OBSERVATIONS

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words of transferring the obligations to a unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

TABLE OF CONTENTS

SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

		2015
Actuarial Valuation Date		June 30, 2015
Measurement Date of the Net Pension Liability		June 30, 2015
Membership		
Number of		
- Service Retirements		30,871
- Survivors		3,786
- Disability Retirements		1,819
- Deferred Retirements		16,787
- Terminated other non-vested		6,941
- Active Members		49,037
- Total		109,241
Covered-employee Payroll	$	2,714,418 [1]
Net Pension Liability		
Total Pension Liability	$	13,177,712
Plan Fiduciary Net Position		11,638,319
Net Pension Liability	$	1,539,393
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		88.32%
Net Pension Liability as a Percentage of Covered-employee Payroll		56.71%
Development of the Single Discount Rate		
Single Discount Rate		7.90%
Long-Term Expected Rate of Investment Return		7.90%
Long-Term Municipal Bond Rate[2]		3.80%
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded		2115
Total Pension Expense/ (Income)	$	(370,172)

Deferred Outflows and Deferred Inflows by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of the Total Pension Liability	$ -	$ 420,971
Changes in assumptions	-	886,384
Net difference between projected and actual earnings on pension plan investments	314,342	630,826
Totals	$ 314,342	$ 1,938,181

(1) *Assumed equal to actual member contributions divided by employee contribution rate*

(2) *Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 25, 2015 (i.e., the weekly rate closest to but not later than the Measurement Date).*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

DISCUSSION

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans,* establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state and local governmental employers to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to SERF subsequent to the measurement date of June 30, 2015.

The pension expense or income recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the difference between expected and actual experience in the measurement of the total pension liability, assumption changes, and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a Statement of Fiduciary Net Position and a Statement of Changes in Fiduciary Net Position in accordance with GASB Statement No. 67. The *Statement of Fiduciary Net Position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *Statement of Changes in Fiduciary Net Position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the State Employees Retirement Fund can be found online at www.msrs.state.mn.us/financial-information or obtained from MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 55103 or requested via email at info@msrs.us or telephone at 1-800-657-5757.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

GASB Statements Nos. 67 and 68 require that an actuarial valuation to determine the total pension liability be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2015 and a measurement date of June 30, 2015.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the weekly rate closest to but not later than the measurement date of the 20-Year Bond Buyer Index as published by the Federal Reserve Board); and the resulting single discount rate is 7.90%.

Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB. MSRS first implemented GASB Statement No. 67 for fiscal year 2014.

SECTION B

FINANCIAL STATEMENTS

PENSION EXPENSE UNDER GASB STATEMENT NO. 68
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Expense/(Income)		
1.	Service Cost	$ 210,545
2.	Interest on the Total Pension Liability	1,018,035
3.	Current-Period Benefit Changes	-
4.	Employee Contributions (made negative for addition here)	(149,293)
5.	Projected Earnings on Plan Investments (made negative for addition here)	(894,112)
6.	Pension Plan Administrative Expense	8,719
7.	Other Changes in Plan Fiduciary Net Position	(29,470)
8.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability	
	Arising from Current Reporting Period	(98,639)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes	
	Arising from Current Reporting Period	-
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments	
	Arising from Current Reporting Period	78,585
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$ 144,370**
12.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability	
	Arising from Prior Reporting Periods	(8,805)
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes	
	Arising from Prior Reporting Periods	(295,462)
14.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments	
	Arising from Prior Reporting Periods	(210,275)
15.	**Total Pension Expense/ (Income)[1]**	**$ (370,172)**

(1) Service cost and interest on Total Pension Liability were offset by decreases in Net Pension Liability, primarily due to recognition of prior year inflows in the current period due to assumption changes and better than expected return on the market value of assets.

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD

FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows (Inflows) of Resources due to Liabilities		
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$	(493,197)
2. Assumption Changes (gains) or losses		-
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years, rounded to the nearest whole number}		5.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience in the measurement of the Total Pension Liability*	$	(98,639)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes		-
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(98,639)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$	(394,558)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes		-
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(394,558)
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	392,927
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	78,585
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	314,342

* *Includes impact of changes in expected timing of future COLA increases.*

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS

FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Due to Liabilities	$ -	$ 402,906	$ (402,906)
2. Due to Assets	78,585	210,275	(131,690)
3. Total	$ 78,585	$ 613,181	$ (534,596)

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Differences between expected and actual experience	$ -	$ 107,444	$ (107,444)
2. Assumption Changes	-	295,462	(295,462)
3. Net Difference between projected and actual earnings on pension plan investments	78,585	210,275	(131,690)
4. Total	$ 78,585	$ 613,181	$ (534,596)

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/ (Inflows) of Resources
1. Differences between expected and actual experience	$ -	$ 420,971	$ (420,971)
2. Assumption Changes	-	886,384	(886,384)
3. Net Difference between projected and actual earnings on pension plan investments	314,342	630,826	(316,484)
4. Total	$ 314,342	$ 1,938,181	$ (1,623,839)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows/ (Inflows) of Resources
2016	$ (534,596)
2017	(534,596)
2018	(534,593)
2019	(20,054)
2020	-
Thereafter	-
Total	$ (1,623,839)

STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

Assets		**June 30, 2015**
Cash & Short-term Investments	$	214,452
Receivables		17,980
Investment Pools (at fair value)		11,398,405
Securities Lending Collateral		1,185,073
Capital Assets		19,694
Total Assets	**$**	**12,835,604**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(1,197,285)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**11,638,319**

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

1.	**Net Position at market value at beginning of year**	**$**	**11,498,604**
Additions			
2.	Contributions		
	a. Employee	$	149,293
	b. Employer		146,333
	c. Other sources		-
	d. Total contributions	$	295,626
3.	Investment income		
	a. Investment income/(loss)	$	517,368
	b. Investment expenses		(16,183)
	c. Net investment income/(loss)	$	501,185
4.	Other Additions		29,493
5.	**Total Additions (2.d.) + (3.c.) + (4.)**	**$**	**826,304**
Deductions			
6.	Benefits Paid		
	a. Annuity benefits	$	(665,821)
	b. Refunds		(12,026)
	c. Total benefits paid	$	(677,847)
7.	Expenses		
	a. Other deductions	$	(23)
	b. Administrative		(8,719)
	c. Total expenses	$	(8,742)
8.	**Total deductions (6.c.) + (7.c.)**	**$**	**(686,589)**
9.	**Net increase/(decrease) in fiduciary net position (5.) + (8.)**	**$**	**139,715**
10.	**Net position at market value at end of year (1.) + (9.)**	**$**	**11,638,319**
11.	State Board of Investment calculated annual investment return		4.4%

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2015 (Dollars in Thousands)

A. Total pension liability		
1. Service Cost	$	210,545
2. Interest on the Total Pension Liability		1,018,035
3. Changes of benefit terms		-
4. Difference between expected and actual experience of the Total Pension Liability*		(493,197)
5. Changes of assumptions		-
6. Benefit payments, including refunds of employee contributions		(677,847)
7. Net change in total pension liability	$	57,536
8. Total pension liability – beginning		13,120,176
9. Total pension liability – ending	**$**	**13,177,712**
B. Plan fiduciary net position		
1. Contributions – employer	$	146,333
2. Contributions – employee		149,293
3. Net investment income		501,185
4. Benefit payments, including refunds of employee contributions		(677,847)
5. Pension Plan Administrative Expense		(8,719)
6. Other changes		29,470
7. Net change in plan fiduciary net position	$	139,715
8. Plan fiduciary net position – beginning, as restated		11,498,604
9. Plan fiduciary net position – ending	**$**	**11,638,319**
C. Net pension liability, *A.9. - B.9.*	**$**	**1,539,393**
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9. / A.9.*		**88.32%**
E. Covered-employee payroll	**$**	**2,714,418** (1)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**56.71%**

(1) *Assumed equal to actual member contributions divided by employee contribution rate.*

* *Includes impact of changes in expected timing of future COLA increases.*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS MULTIYEAR (DOLLARS IN THOUSANDS)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal year ending June 30,	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Pension Liability										
Service Cost	$ 210,545	$ 256,155								
Interest on the Total Pension Liability	1,018,035	922,181								
Benefit Changes	-	-								
Difference between Expected and Actual Experience	(493,197)	(44,023)								
Assumption Changes	-	(1,477,308)								
Benefit Payments	(665,821)	(623,942)								
Refunds	(12,026)	(11,986)								
Net Change in Total Pension Liability	$ 57,536	$ (978,923)								
Total Pension Liability - Beginning	13,120,176	14,099,099								
Total Pension Liability - Ending (a)	**$13,177,712**	**$13,120,176**								
Plan Fiduciary Net Position										
Employer Contributions	$ 146,333	$ 128,037								
Employee Contributions	149,293	131,033								
Pension Plan Net Investment Income	501,185	1,829,621								
Benefit Payments	(665,821)	(623,942)								
Refunds	(12,026)	(11,986)								
Pension Plan Administrative Expense	(8,719)	(8,125)								
Other Changes	29,470	20,528								
Net Change in Plan Fiduciary Net Position	$ 139,715	$ 1,465,166								
Plan Fiduciary Net Position - Beginning	11,498,604	10,033,438								
Plan Fiduciary Net Position - Ending (b)	**$11,638,319**	**$11,498,604**								
Net Pension Liability - Ending (a) - (b)	**$ 1,539,393**	**$ 1,621,572**								
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**88.32 %**	**87.64 %**								
Covered-Employee Payroll [1]	**$ 2,714,418**	**$ 2,620,660**								
Net Pension Liability as a Percentage of Covered-Employee Payroll	**56.71 %**	**61.88 %**								

Notes to Schedule:

(1) Assumed equal to actual member contribution divided by employee contribution rate.

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF THE NET PENSION LIABILITY MULTIYEAR
(DOLLARS IN THOUSANDS)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal Year Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered-employee Payroll	Net Pension Liability as a % of Covered-employee Payroll
	(a)	(b)	(a) - (b) = (c)	(b) / (a)	(d)	(c) / (d)
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 13,120,176	$ 11,498,604	$ 1,621,572	87.64%	$ 2,620,660	61.88%
2015	13,177,712	11,638,319	1,539,393	88.32%	2,714,418	56.71%

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

Schedule of Contributions Multiyear (Dollars in Thousands)

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Actuarially Determined Contribution [1]	Actual Contributions	Contribution Deficiency (Excess)	Covered-employee Payroll	Actual Contribution as a % of Covered-employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b) / (d)
2006	$ 127,371	$ 82,645	$ 44,726	$ 2,016,588	4.10%
2007	122,389	86,492	35,897	2,095,310	4.13
2008	166,088	96,746	69,342	2,256,528	4.29
2009	179,759	107,211	72,548	2,329,499	4.60
2010	230,439	113,716	116,723	2,327,398	4.89
2011	146,191	118,563	27,628	2,440,580	4.86
2012	142,740	115,159	27,581	2,367,160 [2]	4.86
2013	181,756	121,673	60,083	2,483,000 [2]	4.90
2014	195,239	128,037	67,202	2,620,660 [2]	4.89
2015	198,695	146,333	52,362	2,714,418 [2]	5.39

Notes to Schedule of Contributions

Valuation Date:	June 30, 2015
Notes	(1) Actuarially determined contribution rates are calculated as of each July 1 and apply to the fiscal year beginning on the measurement date. (2) Assumed equal to actual member contributions divided by employee contribution rate.

Methods and Assumptions Used to Determine Contribution Rates Reported in this Schedule:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	26 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Salary Increases	Service based table of rates ranging from 10.25% with one year of service to 3.25% with 17 or more years of service, including inflation
Investment Rate of Return	8.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2010 valuation pursuant to an experience study of the period 2004 - 2008, prepared by a former actuary.
Healthy Post-retirement Mortality	RP-2000 annuitant generational mortality table, projected with mortality improvement scale AA, white collar adjustment.

Other Information:

Benefit Increases After Retirement	The post-retirement increase is assumed to increase from 2.0% to 2.5% beginning January 1, 2036.
	See separate funding actuarial valuation report as of July 1, 2015 for additional detail. To obtain this report, contact MSRS as noted on page 3. The report is also available online at www.msrs.state.mn.us/actuarial-reports.

SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	18.67 %
2015	4.45 %

[1] *Annual money-weighted rate of return, net of investment expenses.*

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

Rate of Return

For the fiscal year ended June 30, 2015, the annual money-weighted rate of return for the State Employees Retirement Fund was 4.45%. The money-weighted rate of return is a method of calculating period-by-period returns on pension plan investments that adjusts for the changing amounts actually invested. For purposes of this schedule, the money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

10-Year Schedule of Money-Weighted Investment Return

Ten-year data is not available. Additional years will be provided when they become available.

To request additional information about the computation of the annual money-weighted rate of return and the investments for the Minnesota Retirement Systems (including the investments for MSRS' defined benefit retirement funds), contact SBI at 60 Empire Drive, Suite 355, St. Paul, Minnesota, 55103, via email at minn.sbi@state.mn.us or telephone at (651) 296-3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

ASSET ALLOCATION

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Best estimates for expected future real rates of return (expected returns, net of inflation) were developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce a geometric, long-term expected rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each major asset class that is included in the pension fund's target asset allocation as of June 30, 2015, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	45.00%	5.50%
International Stocks	15.00%	6.00%
Bonds	18.00%	1.45%
Alternative Assets	20.00%	6.40%
Unallocated Cash	2.00%	0.50%
Total	100.00%	

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

At MSRS' direction, for purposes of this valuation, the long-term expected rate of return assumption is 7.90%. This assumption is based on a review of inflation and investment return assumptions dated September 11, 2014.

Single Discount Rate

A Single Discount Rate of 7.90% was used to measure the total pension liability. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.90%. The projection of cash flows used to determine this Single Discount Rate assumed that employee and employer contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 7.90%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower (6.9%) or one percent higher (8.9%):

Sensitivity of Net Pension Liability
to the Single Discount Rate Assumption
(Dollars in Thousands)

	1% Decrease 6.90%	Current Single Discount Rate Assumption 7.90%	1% Increase 8.90%
Total Pension Liability	$ 14,789,450	$ 13,177,712	$ 11,836,449
Net Position Restricted for Pensions	11,638,319	11,638,319	11,638,319
Net Pension Liability	**$ 3,151,131**	**$ 1,539,393**	**$ 198,130**

For more information on the calculation of the single discount rate, refer to Section G of this report.

GASB Statement No. 68 Reconciliation (Dollars in Thousands)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Total Pension Expense
Balance Beginning of Year	**$ 13,120,176**	**$ 11,498,604**	**$ 1,621,572**	**$ -**	**$ 2,058,165**	
Changes for the Year:						
Service Cost	$ 210,545		$ 210,545			$ 210,545
Interest on Total Pension Liability	1,018,035		1,018,035			1,018,035
Interest on Fiduciary Net Position [1]		$ 894,112	(894,112)			(894,112)
Changes in Benefit Terms	-		-			-
Liability Experience Gains and Losses	(493,197)		(493,197)	$ -	$ 394,558	(98,639)
Changes in Assumptions	-		-	-	-	-
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)					(8,805)	(8,805)
Assumption Changes					(295,462)	(295,462)
Investment Gains/(Losses)					(210,275)	(210,275)
Contributions - Employer		146,333	(146,333)			
Contributions - Employees		149,293	(149,293)			(149,293)
Asset Gain/(Loss) [1]		(392,927)	392,927	314,342	-	78,585
Benefit Payments and Refunds	(677,847)	(677,847)	-			
Administrative Expenses		(8,719)	8,719			8,719
Other changes		29,470	(29,470)			(29,470)
Net Changes	**$ 57,536**	**$ 139,715**	**$ (82,179)**	**$ 314,342**	**$ (119,984)**	**$ (370,172)**
Balance End of Year	**$ 13,177,712**	**$ 11,638,319**	**$ 1,539,393**	**$ 314,342**	**$ 1,938,181**	

[1] *The sum of these items equals the net investment income of $501,185.*

SUMMARY OF POPULATION STATISTICS

	Terminated*		Recipients**			
	Actives	**Deferred Retirement**	**Other Non-Vested**	**Service Retirement**	**Disability Retirement**	**Survivor**	**Total**
Members on 7/1/2014	**49,663**	**16,472**	**5,818**	**29,225**	**1,818**	**3,686**	**106,682**
New Members	4,755		0	0	0	0	**4,755**
Return to active	296	(165)	(131)	0	0	0	**0**
Terminated non-vested	(1,809)	0	1,809	0	0	0	**0**
Service retirements	(1,598)	(711)	0	2,309	0	0	**0**
Unclassified retirements				70			**70**
Terminated deferred	(1,268)	1,268	0	0	0	0	**0**
Terminated refund/transfer	(849)	(169)	(934)	0	0	0	**(1,952)**
Deaths	(62)	(30)	(9)	(841)	(69)	(190)	**(1,201)**
New beneficiary	0		0	0	0	303	**303**
Disabled	(58)		0	0	58	0	**0**
Unexpected status change	(33)	122	388	108	12	(13)	**584**
Net change	(626)	315	1,123	1,646	1	100	**2,559**
Members on 6/30/2015	**49,037**	**16,787**	**6,941**	**30,871**	**1,819**	**3,786**	**109,241**

* *Includes members in the General or Military Affairs Plans.*
** *Includes members in the General, Military Affairs or Unclassified Plans.*

SECTION E

SUMMARY OF BENEFITS

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, non-academic staff of the University of Minnesota and employees of certain Metro level government units, unless excluded by law.
Contributions	Shown as a percent of salary: **Effective date** — **Member** — **Employer** July 1, 2014 — 5.50% — 5.50% 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 leaves of absence, military service and periods while temporary Worker's Compensation is paid. Excludes lump sum vacation and severance pay at termination.
Average Salary	Average of the five highest successive years of Salary. Average Salary is based on all Allowable Service if less than five years.
Salary	Includes wages, allowances and fees. Excludes lump sum payments at separation, employer contributions to deferred compensation and tax-sheltered annuity plans and benevolent vacation and sick leave donation programs.
Retirement Normal retirement benefit Age/Service requirement	First hired before July 1, 1989: (a.) Age 65 and three years of Allowable Service. (b.) Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service. First hired after June 30, 1989: (a.) The greater of age 65 or the age eligible for full Social Security retirement benefits (but not higher than age 66) and three years of Allowable Service (five years if hired after June 30, 2010). (b.) Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service.
Amount	1.70% of Average Salary for each year of Allowable Service.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Retirement (Continued)	
Early retirement	
Age/Service requirement	First hired before July 1, 1989: (a.) Age 55 and three years of Allowable Service. (b.) Any age with 30 years of Allowable Service. (c.) Rule of 90: Age plus Allowable Service totals 90. First hired after June 30, 1989: (a.) Age 55 and three years (five years if hired after June 30, 2010) of Allowable Service.
Amount	First hired before July 1, 1989: The greater of (a) or (b): (a.) 1.20% of Average Salary for each of the first ten years of Allowable Service and 1.70% of Average Salary for each subsequent year with reduction of 0.25% for each month the member is under age 65 at time of retirement or under age 62 if 30 or more years of Allowable Service. No reduction if age plus years of Allowable Service totals 90. (b.) 1.70% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the member is under age 65. First hired after June 30, 1989: 1.70% of Average Salary for each year of Allowable Service assuming augmentation to the age eligible for full Social Security retirement benefit (but not higher than age 66) at 3.00% (2.50% if hired after June 30, 2006) per year and actuarial reduction for each month the member is under the normal retirement age.
Form of payment	Life annuity with return on death of any balance of member contributions over aggregate monthly payments. Actuarially equivalent options are: (a.) 50%, 75%, or 100% Joint and Survivor with bounce back feature without additional reduction. (b.) 15-year Certain and Life.
Benefit increases	Since 2011, benefit recipients have received annual 2.0% benefit increases. When the funding ratio reaches 90% (actuarial accrued liability ratio on a market value of assets basis) for two consecutive years, the benefit increase will revert to 2.5%. If, after reverting to a 2.5% increase, the funding ratio (determined on a market value of assets basis) declines to less than 80% for the most recent actuarial valuation year or 85% for two consecutive years, the benefit increase will decrease to 2.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a pro rata increase.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Retirement (Continued)	
Benefit increases (Continued)	Prior to 2002, members who retired under the laws in effect before July 1, 1973 received an additional lump sum payment each year. In 1989, this lump sum payment was the greater of $25 times each full year of Allowable Service or $400 per full year of service less any Social Security benefits received or annuity from a Minnesota public employee pension plan. In each following year, the lump sum payment was increased by the same percentage increase that was applied to regular annuities paid from the Minnesota Post Retirement Investment Fund. Effective January 1, 2002, the annual lump sum payment was divided by 12 and paid as a monthly life annuity in the annuity form elected.
Disability	
Disability benefit	
Age/Service requirement	Total and permanent disability before normal retirement age with three years of Allowable Service (five years if hired after June 30, 2010).
Amount	Normal Retirement benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age. Payments stop if disability ceases or death occurs. Payments revert to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment.
Retirement after disability	
Age/Service requirement	Normal retirement age with continued disability.
Amount	Any optional annuity continues. Otherwise, a normal retirement benefit equal to the disability benefit paid before normal retirement age, or an actuarially equivalent optional annuity.
Form of payment	Same as for retirement.
Benefit Increases	Same as for retirement.
Death	
Surviving spouse optional benefit	
Age/Service requirement	Member or former member who dies before retirement or disability benefits commence with three years of Allowable Service (five years if hired after June 30, 2010). 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 55 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.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Death (Continued)	
Amount (Continued)	If a member dies prior to July 1, 1997 and the beneficiary was not eligible to commence a survivor benefit as of July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.
<u>Surviving dependent children's benefit</u>	
Age/Service requirement	If no surviving spouse, all children (biological or adopted) below age 20 who are dependent for more than half of their support on deceased member.
Amount	Actuarially equivalent 100% joint and survivor annuity to surviving spouse payable to the later of age 20 or five years. The amount is proportionally divided among surviving children.
Benefit increases	Same as for retirement.
<u>Refund of contributions</u>	
Age/Service requirement	Active member dies and survivor benefits are not payable or a former member dies before annuity begins or former member who is not entitled to an annuity dies.
Amount	Member's contributions with 6.00% interest through June 30, 2011 compounded daily. Beginning July 1, 2011, a member's contributions increase at 4.00% interest compounded daily.
Age/Service requirement	Retired or disabled annuitant who did not select an optional annuity dies, or the remaining recipient of an option dies.
Amount	The excess of the member's contributions over all benefits paid.
Unclassified Plan Provision	Eligible members credited with employee shares in the Unclassified Plan may elect to terminate participation in the Unclassified Plan and be covered by the State Employees Retirement Fund prior to termination of covered employment assuming that the member has acquired at least 10 years of allowable state service (no more than seven years of service if hired after June 30, 2010).
Termination	
<u>Refund of contributions</u>	
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 increase at 4.00% interest compounded daily. If a member is vested, a deferred annuity may be elected in lieu of a refund.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Termination (Continued) Deferred benefit Age/Service requirement	 Three years of Allowable Service if hired prior to June 30, 2010, five years of Allowable Service if hired after June 30, 2010.
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; (d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012. Amount is payable as a normal or early retirement; (e.) 2.00% from January 1, 2012 thereafter. Amount is payable at normal or early retirement. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
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; (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.
Actuarial Equivalent Factors	Actuarially equivalent factors based on RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2025 using scale AA, blended 55% males, 8.5% pre-retirement interest, and 6.5% post-retirement interest.

SUMMARY OF PLAN PROVISIONS (CONCLUDED)

Contribution Stabilizer	The following is a summary of the contribution stabilizer provisions in Minnesota Statute 352.045: • If a contribution sufficiency of at least 1.0% of covered payroll exists, member and employer contributions may be adjusted by the MSRS Board of Directors to a level necessary to maintain a 1.0% sufficiency. Member and employer contributions may not be less than the sum of normal cost and administrative expenses. • If a contribution deficiency of at least 0.5% of covered payroll exists, the member and employer contribution rates may be increased equally by the MSRS Board of Directors to eliminate the deficiency. • Any adjustment to the contribution rates must be reported to the Legislative Commission on Pensions and Retirement (LCPR) by January 15 following the most recent valuation report. If the LCPR does not recommend against or alter the change in rates, the adjustment becomes effective on the first day of the first full payroll period of the fiscal year following receipt of the actuarial valuation that gave rise to the adjustment.
Changes in Plan Provisions	The Contribution Stabilizer statutes were revised to make changes to contribution rates less prescriptive and more flexible. Effective July 1, 2015, a provision was added so that if the 2.5% post-retirement benefit increase is triggered and the funding ratio (determined on a market value of assets basis) subsequently drops below 80% for the most recent valuation year or 85% for two consecutive years, the post-retirement benefit increase will change to 2.0% until the plan again reaches a 90% funding ratio for two consecutive years.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

ACTUARIAL METHODS

Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an **Individual Entry-Age Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement;

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Total Pension Liability.

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 2.0% post-retirement benefit increase. If the funding ratio (determined on a market value of assets basis) reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.5%. If, after reverting to a 2.5% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 2.0%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns of 7.90%
- Liabilities and normal cost based on statutory funding assumptions
  - Discount rate of 8.00%
  - Statutory salary increases (rate of 10.25% at year 1 declining to 3.25% at years 17 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 2.0% per year until the funding ratio threshold required to pay a 2.5% postretirement benefit increase is reached
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by MSRS

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay a 2.5% postretirement benefit increase in the year 2043, and that the plan would begin paying 2.5% benefit increases on January 1, 2044. This assumption is reflected in our calculations.

Decrement Timing

All decrements are assumed to occur mid-year.

Asset Valuation Method

Fair value of assets.

Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. The demographic assumptions are based on the experience study, dated August 2009, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014.

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	7.90%
Single discount rate	7.90%
Benefit increases after retirement	2.00% per annum through 2043 and 2.5% per annum thereafter
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.
Inflation	2.75% per year.
Payroll growth	3.50% per year.
Mortality rates	
Healthy Pre-retirement	RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment, set forward three years for males and set back one year for females.
Healthy Post-retirement	RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment. 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, white collar adjustment, with no setback for males and set forward five years for females.
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.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

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: **First Year** / **Second Year** / **Third Year** Male: 0.45 / 0.14 / 0.09 Female: 0.48 / 0.15 / 0.10
Disability	Age-related rates based on experience; see table of sample rates.
Allowance for Combined Service Annuity	Liabilities for active members are increased by 1.20% and liabilities for former members are increased by 40.00% to account for the effect of some participants having eligibility for a Combined Service Annuity.
Administrative expenses	For purposes of the Projection of Plan Fiduciary Net Position, total prior year administrative expenses expressed as a percentage of prior year projected payroll are assumed to increase 3.50% per year and are allocated to the closed group based on the ratio of closed group payroll to total 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 normal retirement age.
Percentage married	85% of active male members and 70% of female members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Male members are assumed to have a beneficiary three years younger and female members are assumed to have a beneficiary two years older.
Form of payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 15% elect 50% Joint & Survivor option 10% elect 75% Joint & Survivor option 50% elect 100% Joint & Survivor option Females: 15% elect 50% Joint & Survivor option 0% elect 75% Joint & Survivor option 25% 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 life annuity.
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.
Unclassified Plan Reversion	Liabilities for active members are increased by 0.21% (0.18% as of July 1, 2014) to account for the effect of Unclassified members who elect coverage under the State Employees Retirement Fund.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by MSRS. 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. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members:</u> There were 109 members reported with zero or invalid salary. We used prior year salary (68 members), if available, otherwise, high five salary with a 10% load to account for salary increases (33 members). If neither pay nor high five salary was available, we assumed a value of $35,000 (8 members). There were 24 members reported with zero or negative service. Due to the small number of members with zero service, and based on direction from MSRS, we used service of 0 years for these members. There were also 31 members reported without a gender and 16 members reported with an invalid date of birth. We assumed the member was hired at age 37 and female gender. <u>Data for terminated members:</u> There were 575 members reported with a missing or invalid benefit. If available, we calculated benefits for these members using the reported Average Salary, Credited Service and Termination Date provided. If Average Salary was not reported (552 members), we assumed a value of $30,000. If termination date was not reported (14 members), we assumed the member terminated at age 40 (or current age if younger than 40). If credited service was either not reported or invalid (9 members), we assumed a value of 7.5 years. There were no members with an invalid gender or date of birth. <u>Data for members receiving benefits:</u> There were 4 members reported without a gender. We assumed female gender for the valuation. No retired members were reported with an invalid date of birth. There were 3 members reported without a benefit. Due to the small number of members with missing benefits, we made no adjustment to the reported data for members receiving benefits. There were 3 survivor members reported with a certain end date prior to the valuation date. These members were excluded from the valuation. There were 390 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e. “bounce back”), if applicable.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	Data for members receiving benefits: There were 287 retirees reported with a bounce back 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. There were retired members reported with a survivor option and an invalid or missing survivor gender (4,614 members) and/or survivor date of birth (4,134 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.
Changes in actuarial assumptions	The assumed post-retirement benefit increase rate was changed from 2.0% per year through 2015 and 2.5% per year thereafter to 2.0% per year through 2043 and 2.5% thereafter. For accounting purposes, this change was treated as a difference between expected and actual experience.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

	Rate (%)*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality	
Age	Male	Female	Male	Female	Male	Female
20	0.03%	0.02%	0.04%	0.02%	2.26%	0.75%
25	0.04	0.02	0.04	0.02	2.26	0.75
30	0.04	0.03	0.05	0.02	2.26	0.75
35	0.06	0.05	0.08	0.04	2.26	0.75
40	0.09	0.06	0.11	0.06	2.26	0.75
45	0.13	0.10	0.17	0.09	2.26	1.15
50	0.60	0.24	0.24	0.15	2.90	1.65
55	0.54	0.35	0.35	0.22	3.54	2.18
60	0.66	0.56	0.56	0.34	4.20	2.80
65	1.16	0.91	0.85	0.54	5.02	3.76
70	1.93	1.52	2.67	0.82	6.26	5.22

* *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	6.90%	8.55%	0.01%	0.01%
25	5.90	7.80	0.01	0.01
30	4.90	7.05	0.01	0.01
35	3.90	5.10	0.03	0.03
40	3.20	4.38	0.08	0.08
45	2.70	3.75	0.13	0.13
50	2.20	3.05	0.29	0.29
55	0.00	0.00	0.50	0.43
60	0.00	0.00	0.78	0.62
65	0.00	0.00	0.00	0.00

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

Retirement		
Age	Rule of 90 Eligible	All Others
55	20%	5%
56	15	5
57	15	5
58	15	5
59	20	6
60	20	7
61	22	12
62	40	22
63	30	16
64	30	18
65	40	40
66	30	30
67	25	25
68	25	25
69	25	25
70	30	30
71+	100	100

Salary Scale	
Year	Increase
1	10.25%
2	7.85
3	6.65
4	5.95
5	5.45
6	5.05
7	4.75
8	4.45
9	4.25
10	4.15
11	3.95
12	3.85
13	3.75
14	3.55
15	3.45
16	3.35
17+	3.25

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Fiduciary Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term expected rate of return is used as the discount rate. In years where assets are not projected to be sufficient to meet benefit payments, the use of a “risk-free” municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the plan fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board (FRB)) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 7.90% and the municipal bond rate is 3.80% (based on the FRB rate as of June 25, 2015). The Plan’s Fiduciary Net Position was projected to be available to meet all projected future benefit payments of current active and inactive employees. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability. **The resulting single discount rate as of July 1, 2015 is 7.90%.**

The tables in this section provide background for the development of the Single Discount Rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate. It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions			
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) * 5.5%	(e) = (a) * 5.5%	(f)	(g) = (d) + (e) + (f)
0	$ 2,714,418		$ 2,714,418				
1	2,727,526		2,727,526	$ 150,014	$ 150,014		$ 300,028
2	2,567,640	$ 255,349	2,822,989	141,220	141,220	$ 7,456	289,896
3	2,431,966	489,828	2,921,794	133,758	133,758	14,303	281,819
4	2,310,749	713,307	3,024,056	127,091	127,091	20,829	275,011
5	2,192,256	937,642	3,129,898	120,574	120,574	27,379	268,527
6	2,076,140	1,163,305	3,239,445	114,188	114,188	33,969	262,345
7	1,965,220	1,387,605	3,352,825	108,087	108,087	40,518	256,692
8	1,860,467	1,609,707	3,470,174	102,326	102,326	47,003	251,655
9	1,761,005	1,830,625	3,591,630	96,855	96,855	53,454	247,164
10	1,666,517	2,050,820	3,717,337	91,658	91,658	59,884	243,200
11	1,576,783	2,270,661	3,847,444	86,723	86,723	66,303	239,749
12	1,491,060	2,491,045	3,982,105	82,008	82,008	72,738	236,754
13	1,409,050	2,712,428	4,121,478	77,498	77,498	79,203	234,199
14	1,330,465	2,935,265	4,265,730	73,176	73,176	85,710	232,062
15	1,254,341	3,160,690	4,415,031	68,989	68,989	92,292	230,270
16	1,180,634	3,388,923	4,569,557	64,935	64,935	98,957	228,827
17	1,109,616	3,619,875	4,729,491	61,029	61,029	105,700	227,758
18	1,040,908	3,854,116	4,895,024	57,250	57,250	112,540	227,040
19	974,464	4,091,885	5,066,349	53,596	53,596	119,483	226,675
20	910,215	4,333,457	5,243,672	50,062	50,062	126,537	226,661
21	848,091	4,579,109	5,427,200	46,645	46,645	133,710	227,000
22	788,133	4,829,019	5,617,152	43,347	43,347	141,007	227,701
23	730,273	5,083,479	5,813,752	40,165	40,165	148,438	228,768
24	674,128	5,343,106	6,017,234	37,077	37,077	156,019	230,173
25	618,930	5,608,907	6,227,837	34,041	34,041	163,780	231,862
26	564,220	5,881,591	6,445,811	31,032	31,032	171,742	233,806
27	510,611	6,160,804	6,671,415	28,084	28,084	179,895	236,063
28	458,477	6,446,437	6,904,914	25,216	25,216	188,236	238,668
29	407,863	6,738,723	7,146,586	22,432	22,432	196,771	241,635
30	359,015	7,037,702	7,396,717	19,746	19,746	205,501	244,993
31	312,055	7,343,547	7,655,602	17,163	17,163	214,432	248,758
32	267,463	7,656,085	7,923,548	14,710	14,710	223,558	252,978
33	226,129	7,974,743	8,200,872	12,437	12,437	232,862	257,736
34	188,144	8,299,758	8,487,902	10,348	10,348	242,353	263,049
35	153,592	8,631,387	8,784,979	8,448	8,448	252,036	268,932
36	122,797	8,969,656	9,092,453	6,754	6,754	261,914	275,422
37	95,989	9,314,700	9,410,689	5,279	5,279	271,989	282,547
38	73,291	9,666,772	9,740,063	4,031	4,031	282,270	290,332
39	54,559	10,026,407	10,080,966	3,001	3,001	292,771	298,773
40	39,530	10,394,269	10,433,799	2,174	2,174	303,513	307,861
41	27,842	10,771,140	10,798,982	1,531	1,531	314,517	317,579
42	18,988	11,157,959	11,176,947	1,044	1,044	325,812	327,900
43	12,566	11,555,574	11,568,140	691	691	337,423	338,805
44	8,093	11,964,932	11,973,025	445	445	349,376	350,266
45	4,980	12,387,101	12,392,081	274	274	361,703	362,251
46	2,862	12,822,941	12,825,803	157	157	374,430	374,744
47	1,499	13,273,207	13,274,706	82	82	387,578	387,742
48	670	13,738,651	13,739,321	37	37	401,169	401,243
49	259	14,219,938	14,220,197	14	14	415,222	415,250
50	104	14,717,800	14,717,904	6	6	429,760	429,772

**Contributions related to future employees in excess of normal cost and expenses of 8.28% of pay.*

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions			
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) * 5.5%	(e) = (a) * 5.5%	(f)	(g) = (d) + (e) + (f)
51	42	15,232,989	15,233,031	$ 2	$ 2	$ 444,803	$ 444,807
52	16	15,766,171	15,766,187	1	1	460,372	460,374
53	6	16,317,998	16,318,004	-	-	476,486	476,486
54	2	16,889,132	16,889,134	-	-	493,163	493,163
55	-	17,480,253	17,480,253	-	-	510,423	510,423
56	-	18,092,062	18,092,062	-	-	528,288	528,288
57	-	18,725,285	18,725,285	-	-	546,778	546,778
58	-	19,380,669	19,380,669	-	-	565,916	565,916
59	-	20,058,993	20,058,993	-	-	585,723	585,723
60	-	20,761,058	20,761,058	-	-	606,223	606,223
61	-	21,487,695	21,487,695	-	-	627,441	627,441
62	-	22,239,764	22,239,764	-	-	649,401	649,401
63	-	23,018,156	23,018,156	-	-	672,130	672,130
64	-	23,823,791	23,823,791	-	-	695,655	695,655
65	-	24,657,624	24,657,624	-	-	720,003	720,003
66	-	25,520,641	25,520,641	-	-	745,203	745,203
67	-	26,413,863	26,413,863	-	-	771,285	771,285
68	-	27,338,348	27,338,348	-	-	798,280	798,280
69	-	28,295,191	28,295,191	-	-	826,220	826,220
70	-	29,285,522	29,285,522	-	-	855,137	855,137
71	-	30,310,515	30,310,515	-	-	885,067	885,067
72	-	31,371,383	31,371,383	-	-	916,044	916,044
73	-	32,469,382	32,469,382	-	-	948,106	948,106
74	-	33,605,810	33,605,810	-	-	981,290	981,290
75	-	34,782,014	34,782,014	-	-	1,015,635	1,015,635
76	-	35,999,384	35,999,384	-	-	1,051,182	1,051,182
77	-	37,259,363	37,259,363	-	-	1,087,973	1,087,973
78	-	38,563,440	38,563,440	-	-	1,126,052	1,126,052
79	-	39,913,161	39,913,161	-	-	1,165,464	1,165,464
80	-	41,310,121	41,310,121	-	-	1,206,256	1,206,256
81	-	42,755,976	42,755,976	-	-	1,248,474	1,248,474
82	-	44,252,435	44,252,435	-	-	1,292,171	1,292,171
83	-	45,801,270	45,801,270	-	-	1,337,397	1,337,397
84	-	47,404,314	47,404,314	-	-	1,384,206	1,384,206
85	-	49,063,465	49,063,465	-	-	1,432,653	1,432,653
86	-	50,780,687	50,780,687	-	-	1,482,796	1,482,796
87	-	52,558,011	52,558,011	-	-	1,534,694	1,534,694
88	-	54,397,541	54,397,541	-	-	1,588,408	1,588,408
89	-	56,301,455	56,301,455	-	-	1,644,002	1,644,002
90	-	58,272,006	58,272,006	-	-	1,701,543	1,701,543
91	-	60,311,526	60,311,526	-	-	1,761,097	1,761,097
92	-	62,422,430	62,422,430	-	-	1,822,735	1,822,735
93	-	64,607,215	64,607,215	-	-	1,886,531	1,886,531
94	-	66,868,467	66,868,467	-	-	1,952,559	1,952,559
95	-	69,208,863	69,208,863	-	-	2,020,899	2,020,899
96	-	71,631,174	71,631,174	-	-	2,091,630	2,091,630
97	-	74,138,265	74,138,265	-	-	2,164,837	2,164,837
98	-	76,733,104	76,733,104	-	-	2,240,607	2,240,607
99	-	79,418,763	79,418,763	-	-	2,319,028	2,319,028
100	-	82,198,419	82,198,419	-	-	2,400,194	2,400,194

**Contributions related to future employees in excess of normal cost and expenses of 8.28% of pay.*

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Net Fiduciary Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Fiduciary Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	$ 11,638,319	$ 300,028	$ 730,367	$ 9,001	$ 902,403	$ 12,101,382
2	12,101,382	289,896	788,463	8,473	936,362	12,530,704
3	12,530,704	281,819	846,789	8,025	967,722	12,925,431
4	12,925,431	275,011	901,003	7,625	996,557	13,288,371
5	13,288,371	268,527	954,503	7,234	1,022,920	13,618,081
6	13,618,081	262,345	1,005,671	6,851	1,046,759	13,914,663
7	13,914,663	256,692	1,055,802	6,485	1,068,042	14,177,110
8	14,177,110	251,655	1,100,927	6,140	1,086,845	14,408,543
9	14,408,543	247,164	1,144,665	5,811	1,103,272	14,608,503
10	14,608,503	243,200	1,185,169	5,500	1,117,358	14,778,392
11	14,778,392	239,749	1,223,475	5,203	1,129,173	14,918,636
12	14,918,636	236,754	1,258,974	4,920	1,138,771	15,030,267
13	15,030,267	234,199	1,291,215	4,650	1,146,253	15,114,854
14	15,114,854	232,062	1,320,514	4,391	1,151,727	15,173,738
15	15,173,738	230,270	1,347,543	4,139	1,155,272	15,207,598
16	15,207,598	228,827	1,371,327	3,896	1,156,978	15,218,180
17	15,218,180	227,758	1,392,612	3,662	1,156,957	15,206,621
18	15,206,621	227,040	1,410,739	3,435	1,155,323	15,174,810
19	15,174,810	226,675	1,426,260	3,216	1,152,202	15,124,211
20	15,124,211	226,661	1,439,538	3,004	1,147,698	15,056,028
21	15,056,028	227,000	1,450,670	2,799	1,141,902	14,971,461
22	14,971,461	227,701	1,458,871	2,601	1,134,938	14,872,628
23	14,872,628	228,768	1,463,234	2,410	1,127,010	14,762,762
24	14,762,762	230,173	1,463,578	2,225	1,118,379	14,645,511
25	14,645,511	231,862	1,460,855	2,042	1,109,294	14,523,770
26	14,523,770	233,806	1,456,508	1,862	1,099,927	14,399,133
27	14,399,133	236,063	1,450,405	1,685	1,090,411	14,273,517
28	14,273,517	238,668	1,441,981	1,513	1,080,922	14,149,613
29	14,149,613	241,635	1,435,294	1,346	1,071,514	14,026,122
30	14,026,122	244,993	1,430,161	1,185	1,062,093	13,901,862
31	13,901,862	248,758	1,423,633	1,030	1,052,682	13,778,639
32	13,778,639	252,978	1,415,818	883	1,043,419	13,658,335
33	13,658,335	257,736	1,405,601	746	1,034,501	13,544,225
34	13,544,225	263,049	1,393,017	621	1,026,185	13,439,821
35	13,439,821	268,932	1,378,900	507	1,018,716	13,348,062
36	13,348,062	275,422	1,362,526	405	1,012,357	13,272,910
37	13,272,910	282,547	1,343,977	317	1,007,418	13,218,581
38	13,218,581	290,332	1,322,674	242	1,004,256	13,190,253
39	13,190,253	298,773	1,298,162	180	1,003,298	13,193,982
40	13,193,982	307,861	1,270,944	130	1,005,001	13,235,770
41	13,235,770	317,579	1,241,035	92	1,009,839	13,322,061
42	13,322,061	327,900	1,208,289	63	1,018,326	13,459,935
43	13,459,935	338,805	1,172,814	41	1,031,016	13,656,901
44	13,656,901	350,266	1,134,197	27	1,048,518	13,921,461
45	13,921,461	362,251	1,093,157	16	1,071,473	14,262,012
46	14,262,012	374,744	1,051,037	9	1,100,493	14,686,203
47	14,686,203	387,742	1,008,384	5	1,136,161	15,201,717
48	15,201,717	401,243	965,415	2	1,179,075	15,816,618
49	15,816,618	415,250	922,246	1	1,229,867	16,539,488
50	16,539,488	429,772	878,924	-	1,289,216	17,379,552

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Net Fiduciary Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Fiduciary Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	$ 17,379,552	$ 444,807	$ 835,483	$ -	$ 1,357,847	$ 18,346,723
52	18,346,723	460,374	791,917	-	1,436,544	19,451,724
53	19,451,724	476,486	748,191	-	1,526,158	20,706,177
54	20,706,177	493,163	704,290	-	1,627,607	22,122,657
55	22,122,657	510,423	660,240	-	1,741,885	23,714,725
56	23,714,725	528,288	616,107	-	1,870,061	25,496,967
57	25,496,967	546,778	571,997	-	2,013,284	27,485,032
58	27,485,032	565,916	528,057	-	2,172,785	29,695,676
59	29,695,676	585,723	484,491	-	2,349,882	32,146,790
60	32,146,790	606,223	441,543	-	2,545,978	34,857,448
61	34,857,448	627,441	399,491	-	2,762,572	37,847,970
62	37,847,970	649,401	358,624	-	3,001,258	41,140,005
63	41,140,005	672,130	319,245	-	3,263,735	44,756,625
64	44,756,625	695,655	281,665	-	3,551,816	48,722,431
65	48,722,431	720,003	246,181	-	3,867,433	53,063,686
66	53,063,686	745,203	213,047	-	4,212,652	57,808,494
67	57,808,494	771,285	182,472	-	4,589,688	62,986,995
68	62,986,995	798,280	154,614	-	5,000,915	68,631,576
69	68,631,576	826,220	129,564	-	5,448,890	74,777,122
70	74,777,122	855,137	107,331	-	5,936,370	81,461,298
71	81,461,298	885,067	87,867	-	6,466,334	88,724,832
72	88,724,832	916,044	71,069	-	7,042,004	96,611,811
73	96,611,811	948,106	56,783	-	7,666,872	105,170,006
74	105,170,006	981,290	44,807	-	8,344,719	114,451,208
75	114,451,208	1,015,635	34,916	-	9,079,648	124,511,575
76	124,511,575	1,051,182	26,872	-	9,876,106	135,411,991
77	135,411,991	1,087,973	20,428	-	10,738,914	147,218,450
78	147,218,450	1,126,052	15,338	-	11,673,297	160,002,461
79	160,002,461	1,165,464	11,371	-	12,684,915	173,841,469
80	173,841,469	1,206,256	8,324	-	13,779,896	188,819,297
81	188,819,297	1,248,474	6,017	-	14,964,869	205,026,623
82	205,026,623	1,292,171	4,294	-	16,247,008	222,561,508
83	222,561,508	1,337,397	3,024	-	17,634,066	241,529,947
84	241,529,947	1,384,206	2,100	-	19,134,422	262,046,475
85	262,046,475	1,432,653	1,439	-	20,757,131	284,234,820
86	284,234,820	1,482,796	971	-	22,511,971	308,228,616
87	308,228,616	1,534,694	646	-	24,409,504	334,172,168
88	334,172,168	1,588,408	424	-	26,461,135	362,221,287
89	362,221,287	1,644,002	274	-	28,679,175	392,544,190
90	392,544,190	1,701,543	174	-	31,076,918	425,322,477
91	425,322,477	1,761,097	109	-	33,668,713	460,752,178
92	460,752,178	1,822,735	67	-	36,470,050	499,044,896
93	499,044,896	1,886,531	41	-	39,497,647	540,429,033
94	540,429,033	1,952,559	24	-	42,769,553	585,151,121
95	585,151,121	2,020,899	14	-	46,305,247	633,477,253
96	633,477,253	2,091,630	8	-	50,125,752	685,694,627
97	685,694,627	2,164,837	4	-	54,253,762	742,113,222
98	742,113,222	2,240,607	2	-	58,713,767	803,067,594
99	803,067,594	2,319,028	1	-	63,532,201	868,918,822
100	868,918,822	2,400,194	1	-	68,737,593	940,056,608

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PRESENT VALUES OF PROJECTED BENEFITS (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
1	$ 11,638,319	$ 730,367	$ 730,367	$ -	$ 703,122	$ -	$ 703,122
2	12,101,382	788,463	788,463	-	703,476	-	703,476
3	12,530,704	846,789	846,789	-	700,199	-	700,199
4	12,925,431	901,003	901,003	-	690,480	-	690,480
5	13,288,371	954,503	954,503	-	677,924	-	677,924
6	13,618,081	1,005,671	1,005,671	-	661,970	-	661,970
7	13,914,663	1,055,802	1,055,802	-	644,085	-	644,085
8	14,177,110	1,100,927	1,100,927	-	622,440	-	622,440
9	14,408,543	1,144,665	1,144,665	-	599,786	-	599,786
10	14,608,503	1,185,169	1,185,169	-	575,541	-	575,541
11	14,778,392	1,223,475	1,223,475	-	550,643	-	550,643
12	14,918,636	1,258,974	1,258,974	-	525,134	-	525,134
13	15,030,267	1,291,215	1,291,215	-	499,149	-	499,149
14	15,114,854	1,320,514	1,320,514	-	473,100	-	473,100
15	15,173,738	1,347,543	1,347,543	-	447,437	-	447,437
16	15,207,598	1,371,327	1,371,327	-	421,996	-	421,996
17	15,218,180	1,392,612	1,392,612	-	397,170	-	397,170
18	15,206,621	1,410,739	1,410,739	-	372,882	-	372,882
19	15,174,810	1,426,260	1,426,260	-	349,383	-	349,383
20	15,124,211	1,439,538	1,439,538	-	326,817	-	326,817
21	15,056,028	1,450,670	1,450,670	-	305,231	-	305,231
22	14,971,461	1,458,871	1,458,871	-	284,483	-	284,483
23	14,872,628	1,463,234	1,463,234	-	264,442	-	264,442
24	14,762,762	1,463,578	1,463,578	-	245,139	-	245,139
25	14,645,511	1,460,855	1,460,855	-	226,768	-	226,768
26	14,523,770	1,456,508	1,456,508	-	209,539	-	209,539
27	14,399,133	1,450,405	1,450,405	-	193,384	-	193,384
28	14,273,517	1,441,981	1,441,981	-	178,184	-	178,184
29	14,149,613	1,435,294	1,435,294	-	164,373	-	164,373
30	14,026,122	1,430,161	1,430,161	-	151,793	-	151,793
31	13,901,862	1,423,633	1,423,633	-	140,037	-	140,037
32	13,778,639	1,415,818	1,415,818	-	129,072	-	129,072
33	13,658,335	1,405,601	1,405,601	-	118,759	-	118,759
34	13,544,225	1,393,017	1,393,017	-	109,078	-	109,078
35	13,439,821	1,378,900	1,378,900	-	100,068	-	100,068
36	13,348,062	1,362,526	1,362,526	-	91,640	-	91,640
37	13,272,910	1,343,977	1,343,977	-	83,774	-	83,774
38	13,218,581	1,322,674	1,322,674	-	76,410	-	76,410
39	13,190,253	1,298,162	1,298,162	-	69,503	-	69,503
40	13,193,982	1,270,944	1,270,944	-	63,064	-	63,064
41	13,235,770	1,241,035	1,241,035	-	57,071	-	57,071
42	13,322,061	1,208,289	1,208,289	-	51,497	-	51,497
43	13,459,935	1,172,814	1,172,814	-	46,325	-	46,325
44	13,656,901	1,134,197	1,134,197	-	41,520	-	41,520
45	13,921,461	1,093,157	1,093,157	-	37,088	-	37,088
46	14,262,012	1,051,037	1,051,037	-	33,048	-	33,048
47	14,686,203	1,008,384	1,008,384	-	29,385	-	29,385
48	15,201,717	965,415	965,415	-	26,073	-	26,073
49	15,816,618	922,246	922,246	-	23,084	-	23,084
50	16,539,488	878,924	878,924	-	20,389	-	20,389

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

Single Discount Rate Development
Present Values of Projected Benefits (Continued)
(Dollars in Thousands)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
51	$ 17,379,552	$ 835,483	$ 835,483	$ -	$ 17,962	$ -	$ 17,962
52	18,346,723	791,917	791,917	-	15,779	-	15,779
53	19,451,729	748,191	748,191	-	13,816	-	13,816
54	20,706,183	704,290	704,290	-	12,053	-	12,053
55	22,122,663	660,240	660,240	-	10,472	-	10,472
56	23,714,732	616,107	616,107	-	9,057	-	9,057
57	25,496,975	571,997	571,997	-	7,793	-	7,793
58	27,485,040	528,057	528,057	-	6,667	-	6,667
59	29,695,684	484,491	484,491	-	5,669	-	5,669
60	32,146,798	441,543	441,543	-	4,788	-	4,788
61	34,857,456	399,491	399,491	-	4,015	-	4,015
62	37,847,978	358,624	358,624	-	3,341	-	3,341
63	41,140,012	319,245	319,245	-	2,756	-	2,756
64	44,756,633	281,665	281,665	-	2,254	-	2,254
65	48,722,438	246,181	246,181	-	1,825	-	1,825
66	53,063,692	213,047	213,047	-	1,464	-	1,464
67	57,808,501	182,472	182,472	-	1,162	-	1,162
68	62,987,002	154,614	154,614	-	913	-	913
69	68,631,582	129,564	129,564	-	709	-	709
70	74,777,128	107,331	107,331	-	544	-	544
71	81,461,304	87,867	87,867	-	413	-	413
72	88,724,838	71,069	71,069	-	309	-	309
73	96,611,817	56,783	56,783	-	229	-	229
74	105,170,012	44,807	44,807	-	168	-	168
75	114,451,213	34,916	34,916	-	121	-	121
76	124,511,580	26,872	26,872	-	86	-	86
77	135,411,996	20,428	20,428	-	61	-	61
78	147,218,456	15,338	15,338	-	42	-	42
79	160,002,468	11,371	11,371	-	29	-	29
80	173,841,477	8,324	8,324	-	20	-	20
81	188,819,304	6,017	6,017	-	13	-	13
82	205,026,630	4,294	4,294	-	9	-	9
83	222,561,515	3,024	3,024	-	6	-	6
84	241,529,954	2,100	2,100	-	4	-	4
85	262,046,481	1,439	1,439	-	2	-	2
86	284,234,827	971	971	-	1	-	1
87	308,228,622	646	646	-	1	-	1
88	334,172,174	424	424	-	1	-	1
89	362,221,294	274	274	-	-	-	-
90	392,544,198	174	174	-	-	-	-
91	425,322,484	109	109	-	-	-	-
92	460,752,185	67	67	-	-	-	-
93	499,044,902	41	41	-	-	-	-
94	540,429,039	24	24	-	-	-	-
95	585,151,128	14	14	-	-	-	-
96	633,477,260	8	8	-	-	-	-
97	685,694,635	4	4	-	-	-	-
98	742,113,230	2	2	-	-	-	-
99	803,067,601	1	1	-	-	-	-
100	868,918,829	1	1	-	-	-	-
				Totals	$ 14,637,509	$ -	$ 14,637,509

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SECTION H

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future benefit payments at predetermined rates of interest to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

GLOSSARY OF TERMS

Amortization Payment The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

Cost-of-Living Adjustments Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan) A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll The payroll of covered employees, which is typically only the pensionable pay (meets the statutory salary definition) and does not include pay above any pay cap.

Deferred Inflows and Outflows of Resources The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate or Single Discount Rate For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method or Entry Age Normal (EAN) The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GLOSSARY OF TERMS

Fiduciary Net Position	The fiduciary net position is the value of the net assets of the trust restricted for pension benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. 68 plan members are not considered non-employer contributing entities.
Normal Cost	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.
Other Postemployment Benefits (OPEB)	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

GLOSSARY OF TERMS

Total Pension Expense The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Changes in Benefit Terms
4. Employee Contributions
5. Projected Earnings on Plan Investments
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to the difference between expected and actual experience in measurement of the Total Pension Liability
9. Recognition of Outflow (Inflow) of Resources due to assumption changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments

Total Pension Liability (TPL) The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL) The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets The valuation assets are the plan fiduciary net position used in determining the net pension liability of the fund. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.

Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

CORRECTIONAL EMPLOYEES RETIREMENT FUND

GASB STATEMENT NOS. 67 AND 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2015

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

November 30, 2015

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

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the Correctional Employees Retirement Fund ("CERF"). These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing financial reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. MSRS is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the Minnesota State Retirement System (MSRS) only in its entirety and only with the permission of MSRS.

This report is based upon information, furnished to us by MSRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not otherwise audited.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Correctional Employees Retirement Fund as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Bonita J. Wurst

By ______________________
Bonita J. Wurst
ASA, EA, MAAA

Brian B Murphy

By ______________________
Brian B. Murphy
FSA, EA, FCA, MAAA

OTHER OBSERVATIONS

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words of transferring the obligations to a unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

TABLE OF CONTENTS

SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

	2015
Actuarial Valuation Date	June 30, 2015
Measurement Date of the Net Pension Liability	June 30, 2015
Membership	
Number of	
- Service Retirements	2,292
- Survivors	198
- Disability Retirements	279
- Deferred Retirements	1,276
- Terminated other non-vested	531
- Active Members	4,449
- Total	9,025
Covered-employee Payroll [1]	$ 231,440
Net Pension Liability	
Total Pension Liability	$ 1,563,245
Plan Fiduciary Net Position	909,002
Net Pension Liability	$ 654,243
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	58.15%
Net Pension Liability as a Percentage of Covered-Employee Payroll	282.68%
Development of the Single Discount Rate	
Single Discount Rate	6.25%
Long-Term Expected Rate of Investment Return	7.90%
Long-Term Municipal Bond Rate [2]	3.80%
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded	2054
Total Pension Expense/ (Income)	$ 38,891

Deferred Outflows and Deferred Inflows of Resources by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of the Total Pension Liability	$ 8,664	$ 0
Changes in assumptions	98,666	98,045
Net difference between projected and actual earnings on pension plan investments	$ 24,320	47,279
Total	$ 131,650	$ 145,324

[1] *Assumed equal to actual member contributions divided by employee contribution rate*
[2] *Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 25, 2015*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

DISCUSSION

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans*, establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state and local governmental employers to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to CERF subsequent to the measurement date of June 30, 2015.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the difference between expected and actual experience in the measurement of the Total Pension Liability, assumption changes and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a Statement of Fiduciary Net Position and a Statement of Changes in Fiduciary Net Position in accordance with GASB Statement No. 67. The *Statement of Fiduciary Net Position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *Statement of Changes in Fiduciary Net Position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the Correctional Employees Retirement Fund can be found online at www.msrs.state.mn.us/financial-information or obtained from MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 55103 or requested via email at info@msrs.us or telephone at 1-800-657-5757.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

GASB Statements Nos. 67 and 68 require that an actuarial valuation to determine the total pension liability be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2015 and a measurement date of June 30, 2015.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the weekly rate closest to but not later than the measurement date of the 20-Year Bond Buyer Index as published by the Federal Reserve Board); and the resulting single discount rate is 6.25%.

Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB. MSRS first implemented GASB Statement No. 67 for fiscal year 2014.

SECTION B

FINANCIAL STATEMENTS

PENSION EXPENSE UNDER GASB STATEMENT NO. 68
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Expense			
1.	Service Cost	$	48,805
2.	Interest on the Total Pension Liability		92,039
3.	Current-Period Benefit Changes		0
4.	Employee Contributions (made negative for addition here)		(21,061)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(69,024)
6.	Pension Plan Administrative Expense		720
7.	Other Changes in Plan Fiduciary Net Position		0
8.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Current Reporting Period		1,186
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		19,733
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Current Reporting Period		6,080
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**78,478**
12.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Prior Reporting Periods		684
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		(24,511)
14.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Prior Reporting Periods		(15,760)
15.	**Total Pension Expense / (Income)**	**$**	**38,891**

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows (Inflows) of Resources due to Liabilities		
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$	7,115
2. Assumption Changes (gains) or losses	$	118,399
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		6.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability*	$	1,186
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	19,733
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	20,919
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$	5,929
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	98,666
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	104,595
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	30,400
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	6,080
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	24,320

* *Includes impact of changes in expected timing of future post-retirement benefit increases.*

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Due to Liabilities	$ 21,603	$ 24,511	$ (2,908)
2. Due to Assets	6,080	15,760	(9,680)
3. Totals	$ 27,683	$ 40,271	$ (12,588)

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Differences between expected and actual experience	$ 1,870	$ 0	$ 1,870
2. Assumption Changes	19,733	24,511	(4,778)
3. Net Difference between projected and actual earnings on pension plan investments	6,080	15,760	(9,680)
4. Totals	$ 27,683	$ 40,271	$ (12,588)

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/ (Inflows) of Resources
1. Differences between expected and actual experience	$ 8,664	$ 0	$ 8,664
2. Assumption Changes	98,666	98,045	621
3. Net Difference between projected and actual earnings on pension plan investments	24,320	47,279	(22,959)
4. Total	$ 131,650	$ 145,324	$ (13,674)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows/ (Inflows) of Resources
2016	$ (12,588)
2017	(12,588)
2018	(12,587)
2019	3,170
2020	20,919
Thereafter	0
Total	$ (13,674)

STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

Assets		**June 30, 2015**
Cash & Short-term Investments	$	18,800
Receivables		1,973
Investment Pools (at fair value)		889,532
Securities Lending Collateral		92,513
Capital Assets		0
Total Assets	**$**	**1,002,818**
Total Deferred Outflows of Resources	**$**	**0**
Total Liabilities	**$**	**(93,816)**
Total Deferred Inflows of Resources	**$**	**0**
Net Position Restricted for Pensions	**$**	**909,002**

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2015 (Dollars in Thousands)

1. Net position at market value at beginning of year	**$**	**877,056**
Additions		
2. Contributions		
a. Employee	$	21,061
b. Employer		29,480
c. Other sources		0
d. Total contributions	$	50,541
3. Investment income		
a. Investment income/(loss)	$	39,877
b. Investment expenses		(1,253)
c. Net investment income/(loss)	$	38,624
4. Other Additions		0
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**89,165**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(54,909)
b. Refunds		(1,590)
c. Total benefits paid	$	(56,499)
7. Expenses		
a. Other deductions	$	0
b. Administrative		(720)
c. Total expenses	$	(720)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(57,219)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**31,946**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**909,002**
11. State Board of Investment calculated annual investment return		4.4%

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS
CURRENT PERIOD
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Total pension liability			
1. Service Cost	$	48,805	
2. Interest on the Total Pension Liability		92,039	
3. Changes of benefit terms		0	
4. Difference between expected and actual experience of the Total Pension Liability		7,115	(1)
5. Changes of assumptions		118,399	(2)
6. Benefit payments, including refunds of employee contributions		(56,499)	
7. Net change in total pension liability	$	209,859	
8. Total pension liability – beginning		1,353,386	
9. Total pension liability – ending	**$**	**1,563,245**	
B. Plan fiduciary net position			
1. Contributions – employer	$	29,480	
2. Contributions – employee		21,061	
3. Net investment income		38,624	
4. Benefit payments, including refunds of employee contributions		(56,499)	
5. Pension Plan Administrative Expense		(720)	
6. Other changes		0	
7. Net change in plan fiduciary net position	$	31,946	
8. Plan fiduciary net position – beginning		877,056	
9. Plan fiduciary net position – ending	**$**	**909,002**	
C. Net pension liability, *A.9 - B.9.*	**$**	**654,243**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9 / A.9.*		**58.15%**	
E. Covered-employee payroll	**$**	**231,440**	(3)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**282.68%**	

(1) *Includes impact of changes in expected timing of future post-retirement benefit increases.*

(2) *Assumption changes are summarized on page 29.*

(3) *Assumed equal to actual member contributions divided by employee contribution rate.*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS MULTIYEAR (DOLLARS IN THOUSANDS)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal year ending June 30,	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Pension Liability										
Service Cost	$ 48,805	$ 54,443								
Interest on the Total Pension Liability	92,039	85,702								
Benefit Changes	0	0								
Difference between Expected and Actual Experience	7,115	4,103								
Assumption Changes	118,399 [1]	(147,067)								
Benefit Payments	(54,909)	(50,842)								
Refunds	(1,590)	(1,447)								
Net Change in Total Pension Liability	$ 209,859	$ (55,108)								
Total Pension Liability - Beginning	1,353,386	1,408,494								
Total Pension Liability - Ending (a)	**$ 1,563,245**	**$ 1,353,386**								
Plan Fiduciary Net Position										
Employer Contributions	$ 29,480	$ 26,468								
Employee Contributions	21,061	18,855								
Pension Plan Net Investment Income	38,624	137,523								
Benefit Payments	(54,909)	(50,842)								
Refunds	(1,590)	(1,447)								
Pension Plan Administrative Expense	(720)	(657)								
Other Changes	0	(1)								
Net Change in Plan Fiduciary Net Position	**$ 31,946**	**$ 129,899**								
Plan Fiduciary Net Position - Beginning	**877,056**	**747,157**								
Plan Fiduciary Net Position - Ending (b)	**$ 909,002**	**$ 877,056**								
Net Pension Liability - Ending (a) - (b)	**$ 654,243**	**$ 476,330**								
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**58.15 %**	**64.80 %**								
Covered-Employee Payroll [2]	**$ 231,440**	**$ 219,244**								
Net Pension Liability as a Percentage of Covered-Employee Payroll	**282.68 %**	**217.26 %**								

Notes to Schedule:

(1) Assumption changes are summarized on page 29.

(2) Assumed equal to plan member contributions divided by employee contribution rate.

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF NET PENSION LIABILITY MULTIYEAR
(DOLLARS IN THOUSANDS)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal Year Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered-Employee Payroll	Net Pension Liability as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(b)/(c)	(d)	(c)/(d)
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 1,353,386	$ 877,056	$ 476,330	64.80%	$ 219,244	217.26%
2015	1,563,245	909,002	654,243	58.15%	231,440	282.68%

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULE OF CONTRIBUTIONS MULTIYEAR

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Actuarially Determined Contribution	Actual Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll	Actual Contribution as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b)/(d)
2006	$ 16,871	$ 12,152	$ 4,719	$ 145,879	8.33%
2007	29,115	13,927	15,188	167,727	8.30
2008	34,734	18,623	16,111	194,391	9.58
2009	31,738	20,126	11,612	193,445	10.40
2010	32,557	21,988	10,569	192,450	11.43
2011	33,274	23,892	9,382	197,702	12.08
2012	34,806	24,188	10,618	200,035	12.09
2013	34,060	24,632	9,428	204,198	12.06
2014	38,390	26,468	11,922	219,244	12.07
2015	40,109	29,480	10,629	231,440	12.74

NOTES TO SCHEDULE OF CONTRIBUTIONS

Valuation Date:	June 30, 2015
Notes	Actuarially determined contribution rates are calculated as of each July 1 and apply to the fiscal year beginning on the measurement date.

Methods and Assumptions Used to Determine Contribution Rates Reported in this Schedule:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	23 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Salary Increases	Service based tables ranging from 5.75% with one year of service to 3.50% with 19 or more years of service, including inflation.
Investment Rate of Return	8.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study of the period 2006 - 2011, prepared by a former actuary.
Healthy Post-Retirement Mortality	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.

Other Information:

Benefit Increases After Retirement	The post-retirement increase is assumed to stay at 2.0% indefinitely. See separate funding actuarial valuation report as of July 1, 2015 for additional detail. To obtain this report, contact MSRS as noted on page 3. This report is also available online at www.msrs.state.mn.us/actuarial-reports.

SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	18.62 %
2015	4.44 %

[1] *Annual money-weighted rate of return, net of investment expenses.*

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

Rate of Return

For the fiscal year ended June 30, 2015, the annual money-weighted rate of return for the Correctional Employees Retirement Fund was 4.44%. The money-weighted rate of return is a method of calculating period-by-period returns on pension plan investments that adjusts for the changing amounts actually invested. For purposes of this schedule, the money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

10-Year Schedule of Money-Weighted Investment Return

Ten-year data is not available. Additional years will be provided when they become available.

To request additional information about the computation of the annual money-weighted rate of return and the investments for the Minnesota Retirement Systems (including the investments for MSRS' defined benefit retirement funds), contact SBI at 60 Empire Drive, Suite 355, St. Paul, Minnesota, 55103, via email at minn.sbi@state.mn.us or telephone at (651) 296-3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

ASSET ALLOCATION

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Best estimates for expected future real rates of return (expected returns, net of inflation) were developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce a geometric, long-term expected real rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each major asset class that is included in the pension fund's target asset allocation as of June 30, 2015, these best estimates are summarized in the following table:

Asset Allocation

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	45.00%	5.50%
International Stocks	15.00	6.00
Bonds	18.00	1.45
Alternative Assets	20.00	6.40
Unallocated Cash	2.00	0.50
Total	100.00%	

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

At MSRS' direction, for purposes of this valuation, the long-term expected rate of return assumption is 7.90%. This assumption is based on a review of inflation and investment return assumptions dated September 11, 2014.

SENSITIVITY OF NET PENSION LIABILITY TO THE SINGLE DISCOUNT RATE ASSUMPTION

Single Discount Rate

A Single Discount Rate of 6.25% was used to measure the total pension liability. This Single Discount Rate was based on an expected rate of return on pension plan investments of 7.90% and a municipal bond rate of 3.80%. The projection of cash flows used to determine this Single Discount Rate assumed that employee and employer contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments through the year ending June 30, 2054. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year ending June 30, 2054, and the municipal bond rate was applied to all benefit payments after the point of asset depletion.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 6.25%, as well as what the fund's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower (5.25%) or 1-percentage-point higher (7.25%) than the current rate.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 5.25%	Current Single Discount Rate Assumption 6.25%	1% Increase 7.25%
Total Pension Liability	$1,809,697	$1,563,245	$1,364,332
Net Position Restricted for Pensions	909,002	909,002	909,002
Net Pension Liability	**$ 900,695**	**$ 654,243**	**$ 455,330**

GASB Statement No. 68 Reconciliation (Dollars in Thousands)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Total Pension Expense
Balance Beginning of Year	**$ 1,353,386**	**$ 877,056**	**$ 476,330**	**$ 3,419**	**$ 185,595**	
Changes for the Year:						
Service Cost	$ 48,805		$ 48,805			$ 48,805
Interest on Total Pension Liability	92,039		92,039			92,039
Interest on Plan Fiduciary Net Position (1)		$ 69,024	(69,024)			(69,024)
Changes in Benefit Terms						
Liability Experience Gains and Losses	7,115		7,115	$ 5,929		1,186
Changes in Assumptions	118,399		118,399	98,666		19,733
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(684)		684
Assumption Changes					$ (24,511)	(24,511)
Investment Gains/(Losses)					(15,760)	(15,760)
Contributions - Employer		29,480	(29,480)			
Contributions - Employees		21,061	(21,061)			(21,061)
Asset Gain/(Loss) (1)		(30,400)	30,400	24,320		6,080
Benefit Payment and Refunds	(56,499)	(56,499)				
Administrative Expenses		(720)	720			720
Other Changes						
Net Changes	**$ 209,859**	**$ 31,946**	**$ 177,913**	**$ 128,231**	**$ (40,271)**	**$ 38,891**
Balance End of Year	**$ 1,563,245**	**$ 909,002**	**$ 654,243**	**$ 131,650**	**$ 145,324**	

(1) *The sum of these items equals the net investment income of $38,624.*

SUMMARY OF POPULATION STATISTICS

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2014	**4,504**	**1,232**	**384**	**2,075**	**268**	**174**	**8,637**
New Members	524	0	0	0	0	0	**524**
Return to active	16	(15)	(1)	0	0	0	**0**
Terminated non-vested	(178)	0	178	0	0	0	**0**
Service retirements	(180)	(51)	0	231	0	0	**0**
Terminated deferred	(120)	120	0	0	0	0	**0**
Terminated refund/transfer	(103)	(16)	(80)	0	0	0	**(199)**
Deaths	(3)	(1)	0	(39)	(1)	(3)	**(47)**
New beneficiary	0	0	0	0	0	26	**26**
Disabled	(10)	0	0	0	10	0	**0**
Unexpected status change	(1)	7	50	25	2	1	**84**
Net change	(55)	44	147	217	11	24	**388**
Members on 6/30/2015	**4,449**	**1,276**	**531**	**2,292**	**279**	**198**	**9,025**

SECTION E

SUMMARY OF BENEFITS

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 — Shown as a percent of salary:

Effective date	Member	Employer
July 1, 2014	9.10%	12.85%

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.

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	Since 2011, benefit recipients have received annual 2.0% benefit increases. If the accrued liability funding ratio reaches 90% (actuarial accrued liability ratio on a Market Value of Assets basis) for two consecutive years, the benefit increase will revert to 2.5%. If, after reverting to a 2.5% increase, the funding ratio declines to less than 80% for one year or 85% for two consecutive years, the benefit increase will decrease to 2.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment 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.

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.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

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; (d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012; and (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.

SUMMARY OF PLAN PROVISIONS (CONCLUDED)

Contribution Stabilizer	The following is a summary of the contribution stabilizer provisions in Minnesota Statute 352.045: • If a contribution sufficiency of at least 1.0% exists, member and employer contributions may be adjusted by the Board of Directors to a level necessary to maintain a 1.0% sufficiency. Member and employer contributions may not be less than the sum of normal cost and administrative expenses. Employer contributions must be equal to 60% of the sum of member and employer contributions. • If a contribution deficiency of at least 0.5% exists, member and employer contribution rates may be increased by the Board of Directors to eliminate the deficiency. Employer contributions must be equal to 60% of the sum of member and employer contributions. • Any adjustment to the contribution rates must be reported to the Legislative Commission on Pensions and Retirement (LCPR) by January 15 following the most recent valuation report. If the LCPR does not recommend against or alter the change in rates, the adjustment becomes effective on the first day of the first full payroll period of the next fiscal year.
Changes in plan provisions	The Contribution Stabilizer statutes were revised to make changes to contribution rates less prescriptive and more flexible. Effective July 1, 2015, a provision was added so that if the 2.5% post-retirement benefit increase is triggered and the funding ratio (determined on a market value of assets basis) subsequently drops below 80% for one year or 85% for two consecutive years, the post-retirement benefit increase will change to 2.0% until the plan again reaches a 90% funding ratio for two consecutive years.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

ACTUARIAL METHODS

Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an **Individual Entry-Age Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement;

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Total Pension Liability.

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 2.0% post-retirement benefit increase. If the funding ratio (determined on a market value of assets basis) reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.5%. If, after reverting to a 2.5% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 2.0%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns of 7.90%
- Liabilities and normal cost based on statutory funding assumptions
    - Discount rate of 8.00%
    - Statutory salary increases (rate of 5.75% at year 1 declining to 3.50% at years 19 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 2.0% per year until the funding ratio threshold required to pay a 2.5% postretirement benefit increase is reached
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by MSRS.

Based on these assumptions and methods, the projection indicates that this plan is not expected to attain the funding ratio threshold required to pay a 2.5% postretirement benefit. This assumption is reflected in our calculations.

Decrement Timing

All decrements are assumed to occur mid-year.

Asset Valuation Method

Fair value of assets.

SUMMARY OF ACTUARIAL ASSUMPTIONS

The following assumptions were used in valuing the liabilities and benefits under the plan. The demographic assumptions are based on the last experience study, dated February 2012, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014.

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	7.90% per annum
Single discount rate	6.25% per annum
Benefit increases after retirement	2.00% per annum
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	3.50% per year.
Inflation	2.75% 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%

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	For purposes of the projection of the Plan Fiduciary Net Position, total prior year administrative expenses expressed as a percentage of prior year projected payroll are assumed to increase 3.50% per year and are allocated to the closed group based on the ratio of closed group payroll to total 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.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by MSRS. 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. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members</u>: There were 11 members reported with zero or invalid salary. We used prior year salary (11 members). There were 2 members reported with missing service. Due to the small number of members with zero service, and based on the direction from MSRS, we used service of 0 years for these members. There were 6 members reported without a gender and 2 members reported with a missing date of birth. We assumed members were hired at age 33 and male gender. <u>Data for terminated members</u>: There were 53 members reported without a benefit. If available, we calculated benefits for these members using the reported Average Salary, Credited Service and Termination Date provided. If Average Salary was not reported (23 members), we assumed a value of $30,000. If Credited Service was not reported (2 members), we assumed a value of 7.5 years. There were no members reported without a Termination Date. There were 61 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. There were no members reported with missing or invalid gender or birth dates. <u>Data for members receiving benefits</u>: There were no members reported with missing gender or invalid birth dates. There were retired members reported with a survivor option and an invalid or missing survivor gender (366 members) and/or survivor date of birth (310 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid. There were 2 members reported without a benefit. Due to the small number of members with missing benefits, we made no adjustment to the reported data for members receiving benefits.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members	Data for members receiving benefits: There were 18 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e. "bounce back"), if applicable. There were 47 retirees reported with a bounce back 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. There were no survivors reported on the data file with an expired benefit.
Change in actuarial assumptions	The single discount rate changed from 6.82% as of July 1, 2014 to 6.25% as of July 1, 2015. The assumed post-retirement benefit increase rate was changed from 2.0% through 2065 and 2.5% thereafter to 2.0% indefinitely. For accounting purposes, this change was treated as a difference between expected and actual experience.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Age	Healthy Post-Retirement Mortality** Male	Healthy Post-Retirement Mortality** Female	Healthy Pre-Retirement Mortality** Male	Healthy Pre-Retirement Mortality** Female	Disability Mortality Male	Disability Mortality Female
	Rate (%)*					
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.*

Age	Withdrawal Rates After Third Year Male	Withdrawal Rates After Third Year Female	Disability Retirement Male	Disability Retirement 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

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	5.75%
2	5.60
3	5.45
4	5.30
5	5.15
6	5.00
7	4.85
8	4.70
9	4.55
10	4.40
11	4.30
12	4.20
13	4.10
14	4.00
15	3.90
16	3.80
17	3.70
18	3.60
19+	3.50

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Fiduciary Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term expected rate of return is used as the discount rate. In years where assets are not projected to be sufficient to meet benefit payments, the use of a "risk-free" municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board (FRB)) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the FRB rate as of June 25, 2015). **The resulting single discount rate as of July 1, 2015 is 6.25%.**

Benefit payments projected to occur up through June 30, 2053 were fully funded and benefit payments projected to occur in the year ended June 30, 2054 were partially funded. Assets were projected to be fully depleted by the fiscal year ending June 30, 2054. Benefit payments were discounted using 7.9%, the long-term expected rate of return on pension plan investments, as long as assets were sufficient to fund the benefit payments. Beginning in the July 1, 2053 to June 30, 2054 fiscal year, when benefit payments exceed the Plan's Fiduciary Net Position, benefit payments were discounted at 3.80%, the municipal bond rate. An equivalent single discount rate was determined that produced approximately the same present value of projected benefits when applied to all years of projected benefits as the present value of projected benefits using 7.90% through the point of asset depletion and 3.80% after. For more information on the calculation of the equivalent present value of projected benefits, see pages 37 through 38 of this report.

The tables in this section provide background for the development of the Single Discount Rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate. It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions			
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) x 9.10%	(e) = (a) x 12.85%	(f)	(g) = (d) + (e) + (f)
0	$ 231,440		$ 231,440				
1	235,404		235,404	$ 21,422	$ 30,249		$ 51,671
2	224,509	$ 19,134	243,643	20,430	28,849	$ 930	50,209
3	215,216	36,955	252,171	19,585	27,655	1,796	49,036
4	206,594	54,403	260,997	18,800	26,547	2,644	47,991
5	198,195	71,937	270,132	18,036	25,468	3,496	47,000
6	189,492	90,094	279,586	17,244	24,350	4,379	45,973
7	180,648	108,724	289,372	16,439	23,213	5,284	44,936
8	171,716	127,784	299,500	15,626	22,066	6,210	43,902
9	163,231	146,751	309,982	14,854	20,975	7,132	42,961
10	155,456	165,376	320,832	14,146	19,976	8,037	42,159
11	147,407	184,654	332,061	13,414	18,942	8,974	41,330
12	139,329	204,354	343,683	12,679	17,904	9,932	40,515
13	132,036	223,676	355,712	12,015	16,967	10,871	39,853
14	124,954	243,208	368,162	11,371	16,057	11,820	39,248
15	117,843	263,204	381,047	10,724	15,143	12,792	38,659
16	110,928	283,456	394,384	10,094	14,254	13,776	38,124
17	103,981	304,206	408,187	9,462	13,362	14,784	37,608
18	97,102	325,372	422,474	8,836	12,478	15,813	37,127
19	90,311	346,949	437,260	8,218	11,605	16,862	36,685
20	83,279	369,286	452,565	7,578	10,701	17,947	36,226
21	75,699	392,705	468,404	6,889	9,727	19,085	35,701
22	68,065	416,733	484,798	6,194	8,746	20,253	35,193
23	60,905	440,861	501,766	5,542	7,826	21,426	34,794
24	54,023	465,305	519,328	4,916	6,942	22,614	34,472
25	47,128	490,377	537,505	4,289	6,056	23,832	34,177
26	40,558	515,759	556,317	3,691	5,212	25,066	33,969
27	34,652	541,137	575,789	3,153	4,453	26,299	33,905
28	29,216	566,725	595,941	2,659	3,754	27,543	33,956
29	24,278	592,521	616,799	2,209	3,120	28,797	34,126
30	19,891	618,496	638,387	1,810	2,556	30,059	34,425
31	15,966	644,765	660,731	1,453	2,052	31,336	34,841
32	12,593	671,263	683,856	1,146	1,618	32,623	35,387
33	9,944	697,847	707,791	905	1,278	33,915	36,098
34	7,770	724,794	732,564	707	998	35,225	36,930
35	5,935	752,269	758,204	540	763	36,560	37,863
36	4,466	780,275	784,741	406	574	37,921	38,901
37	3,273	808,934	812,207	298	421	39,314	40,033
38	2,314	838,320	840,634	211	297	40,742	41,250
39	1,563	868,493	870,056	142	201	42,209	42,552
40	1,014	899,494	900,508	92	130	43,715	43,937
41	625	931,401	932,026	57	80	45,266	45,403
42	359	964,288	964,647	33	46	46,864	46,943
43	197	998,212	998,409	18	25	48,513	48,556
44	103	1,033,251	1,033,354	9	13	50,216	50,238
45	49	1,069,472	1,069,521	4	6	51,976	51,986
46	22	1,106,932	1,106,954	2	3	53,797	53,802
47	8	1,145,690	1,145,698	1	1	55,680	55,682
48	3	1,185,794	1,185,797	0	0	57,630	57,630
49	1	1,227,299	1,227,300	0	0	59,647	59,647
50	0	1,270,255	1,270,255	0	0	61,734	61,734

**Contributions related to future employees in excess of normal cost and expenses of 17.09% of pay.*

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (CONTINUED) (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions			
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) x 9.10%	(e) = (a) x 12.85%	(f)	(g) = (d) + (e) + (f)
51	$ 0	$ 1,314,714	$ 1,314,714	$ 0	$ 0	$ 63,895	$ 63,895
52	0	1,360,729	1,360,729	0	0	66,131	66,131
53	0	1,408,355	1,408,355	0	0	68,446	68,446
54	0	1,457,647	1,457,647	0	0	70,842	70,842
55	0	1,508,665	1,508,665	0	0	73,321	73,321
56	0	1,561,468	1,561,468	0	0	75,887	75,887
57	0	1,616,120	1,616,120	0	0	78,543	78,543
58	0	1,672,684	1,672,684	0	0	81,292	81,292
59	0	1,731,228	1,731,228	0	0	84,138	84,138
60	0	1,791,821	1,791,821	0	0	87,082	87,082
61	0	1,854,534	1,854,534	0	0	90,130	90,130
62	0	1,919,443	1,919,443	0	0	93,285	93,285
63	0	1,986,624	1,986,624	0	0	96,550	96,550
64	0	2,056,155	2,056,155	0	0	99,929	99,929
65	0	2,128,121	2,128,121	0	0	103,427	103,427
66	0	2,202,605	2,202,605	0	0	107,047	107,047
67	0	2,279,696	2,279,696	0	0	110,793	110,793
68	0	2,359,486	2,359,486	0	0	114,671	114,671
69	0	2,442,068	2,442,068	0	0	118,684	118,684
70	0	2,527,540	2,527,540	0	0	122,838	122,838
71	0	2,616,004	2,616,004	0	0	127,138	127,138
72	0	2,707,564	2,707,564	0	0	131,588	131,588
73	0	2,802,329	2,802,329	0	0	136,193	136,193
74	0	2,900,410	2,900,410	0	0	140,960	140,960
75	0	3,001,925	3,001,925	0	0	145,894	145,894
76	0	3,106,992	3,106,992	0	0	151,000	151,000
77	0	3,215,737	3,215,737	0	0	156,285	156,285
78	0	3,328,287	3,328,287	0	0	161,755	161,755
79	0	3,444,778	3,444,778	0	0	167,416	167,416
80	0	3,565,345	3,565,345	0	0	173,276	173,276
81	0	3,690,132	3,690,132	0	0	179,340	179,340
82	0	3,819,286	3,819,286	0	0	185,617	185,617
83	0	3,952,961	3,952,961	0	0	192,114	192,114
84	0	4,091,315	4,091,315	0	0	198,838	198,838
85	0	4,234,511	4,234,511	0	0	205,797	205,797
86	0	4,382,719	4,382,719	0	0	213,000	213,000
87	0	4,536,114	4,536,114	0	0	220,455	220,455
88	0	4,694,878	4,694,878	0	0	228,171	228,171
89	0	4,859,199	4,859,199	0	0	236,157	236,157
90	0	5,029,271	5,029,271	0	0	244,423	244,423
91	0	5,205,295	5,205,295	0	0	252,977	252,977
92	0	5,387,481	5,387,481	0	0	261,832	261,832
93	0	5,576,043	5,576,043	0	0	270,996	270,996
94	0	5,771,204	5,771,204	0	0	280,481	280,481
95	0	5,973,196	5,973,196	0	0	290,297	290,297
96	0	6,182,258	6,182,258	0	0	300,458	300,458
97	0	6,398,637	6,398,637	0	0	310,974	310,974
98	0	6,622,589	6,622,589	0	0	321,858	321,858
99	0	6,854,380	6,854,380	0	0	333,123	333,123
100	0	7,094,283	7,094,283	0	0	344,782	344,782

**Contributions related to future employees in excess of normal cost and expenses of 17.09% of pay.*

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	$ 909,002	$ 51,671	$ 62,902	$ 753	$ 71,347	$ 968,365
2	968,365	50,209	66,646	718	75,836	1,027,046
3	1,027,046	49,036	70,339	689	80,285	1,085,339
4	1,085,339	47,991	74,178	661	84,701	1,143,192
5	1,143,192	47,000	78,162	634	89,080	1,200,476
6	1,200,476	45,973	83,158	606	93,373	1,256,058
7	1,256,058	44,936	88,522	578	97,517	1,309,411
8	1,309,411	43,902	94,123	549	101,476	1,360,117
9	1,360,117	42,961	99,806	522	105,226	1,407,976
10	1,407,976	42,159	105,390	497	108,761	1,453,009
11	1,453,009	41,330	111,255	472	112,060	1,494,672
12	1,494,672	40,515	117,542	446	115,077	1,532,276
13	1,532,276	39,853	123,653	423	117,786	1,565,839
14	1,565,839	39,248	129,570	400	120,186	1,595,303
15	1,595,303	38,659	135,656	377	122,256	1,620,185
16	1,620,185	38,124	141,726	355	123,966	1,640,194
17	1,640,194	37,608	147,866	333	125,290	1,654,893
18	1,654,893	37,127	153,999	311	126,196	1,663,906
19	1,663,906	36,685	160,066	289	126,656	1,666,892
20	1,666,892	36,226	166,444	266	126,628	1,663,036
21	1,663,036	35,701	173,300	242	126,038	1,651,233
22	1,651,233	35,193	180,392	218	124,813	1,630,629
23	1,630,629	34,794	186,981	195	122,915	1,601,162
24	1,601,162	34,472	193,249	173	120,332	1,562,544
25	1,562,544	34,177	199,373	151	117,034	1,514,231
26	1,514,231	33,969	204,863	130	112,997	1,456,204
27	1,456,204	33,905	209,338	111	108,238	1,388,898
28	1,388,898	33,956	213,163	93	102,775	1,312,373
29	1,312,373	34,126	216,246	78	96,617	1,226,792
30	1,226,792	34,425	218,604	64	89,777	1,132,326
31	1,132,326	34,841	220,312	51	82,265	1,029,069
32	1,029,069	35,387	221,210	40	74,094	917,300
33	917,300	36,098	221,022	32	65,299	797,643
34	797,643	36,930	220,072	25	55,916	670,392
35	670,392	37,863	218,513	19	45,960	535,683
36	535,683	38,901	216,280	14	35,445	393,735
37	393,735	40,033	213,521	10	24,382	244,619
38	244,619	41,250	210,296	7	12,774	88,340
39	88,340	42,552	206,635	5	620	0
40	0	43,937	202,558	3	0	0
41	0	45,403	198,112	2	0	0
42	0	46,943	193,332	1	0	0
43	0	48,556	188,247	1	0	0
44	0	50,238	182,893	0	0	0
45	0	51,986	177,301	0	0	0
46	0	53,802	171,490	0	0	0
47	0	55,682	165,478	0	0	0
48	0	57,630	159,275	0	0	0
49	0	59,647	152,894	0	0	0
50	0	61,734	146,344	0	0	0

**Contributions related to future employees in excess of normal cost and expenses of 17.09% of pay.*

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION (CONTINUED)
(DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	$ 0	$ 63,895	$ 139,634	$ 0	$ 0	$ 0
52	0	66,131	132,773	0	0	0
53	0	68,446	125,769	0	0	0
54	0	70,842	118,636	0	0	0
55	0	73,321	111,393	0	0	0
56	0	75,887	104,064	0	0	0
57	0	78,543	96,679	0	0	0
58	0	81,292	89,278	0	0	0
59	0	84,138	81,912	0	0	0
60	0	87,082	74,630	0	0	0
61	0	90,130	67,489	0	0	0
62	0	93,285	60,546	0	0	0
63	0	96,550	53,861	0	0	0
64	0	99,929	47,487	0	0	0
65	0	103,427	41,479	0	0	0
66	0	107,047	35,881	0	0	0
67	0	110,793	30,730	0	0	0
68	0	114,671	26,050	0	0	0
69	0	118,684	21,851	0	0	0
70	0	122,838	18,135	0	0	0
71	0	127,138	14,889	0	0	0
72	0	131,588	12,089	0	0	0
73	0	136,193	9,707	0	0	0
74	0	140,960	7,706	0	0	0
75	0	145,894	6,048	0	0	0
76	0	151,000	4,694	0	0	0
77	0	156,285	3,603	0	0	0
78	0	161,755	2,733	0	0	0
79	0	167,416	2,051	0	0	0
80	0	173,276	1,521	0	0	0
81	0	179,340	1,116	0	0	0
82	0	185,617	808	0	0	0
83	0	192,114	578	0	0	0
84	0	198,838	408	0	0	0
85	0	205,797	284	0	0	0
86	0	213,000	195	0	0	0
87	0	220,455	132	0	0	0
88	0	228,171	87	0	0	0
89	0	236,157	57	0	0	0
90	0	244,423	37	0	0	0
91	0	252,977	23	0	0	0
92	0	261,832	14	0	0	0
93	0	270,996	9	0	0	0
94	0	280,481	5	0	0	0
95	0	290,297	3	0	0	0
96	0	300,458	2	0	0	0
97	0	310,974	1	0	0	0
98	0	321,858	0	0	0	0
99	0	333,123	0	0	0	0
100	0	344,782	0	0	0	0

**Contributions related to future employees in excess of normal cost and expenses of 17.09% of pay.*

SINGLE DISCOUNT RATE DEVELOPMENT
PRESENT VALUES OF PROJECTED BENEFITS (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
1	$ 909,002	$ 62,902	$ 62,902	$ 0	$ 60,555	$ 0	$ 61,024
2	968,365	66,646	66,646	0	59,462	0	60,854
3	1,027,046	70,339	70,339	0	58,163	0	60,450
4	1,085,339	74,178	74,178	0	56,846	0	60,000
5	1,143,192	78,162	78,162	0	55,514	0	59,505
6	1,200,476	83,158	83,158	0	54,738	0	59,586
7	1,256,058	88,522	88,522	0	54,002	0	59,699
8	1,309,411	94,123	94,123	0	53,215	0	59,744
9	1,360,117	99,806	99,806	0	52,297	0	59,625
10	1,407,976	105,390	105,390	0	51,179	0	59,258
11	1,453,009	111,255	111,255	0	50,072	0	58,878
12	1,494,672	117,542	117,542	0	49,028	0	58,547
13	1,532,276	123,653	123,653	0	47,801	0	57,969
14	1,565,839	129,570	129,570	0	46,421	0	57,170
15	1,595,303	135,656	135,656	0	45,043	0	56,336
16	1,620,185	141,726	141,726	0	43,613	0	55,395
17	1,640,194	147,866	147,866	0	42,171	0	54,397
18	1,654,893	153,999	153,999	0	40,705	0	53,321
19	1,663,906	160,066	160,066	0	39,211	0	52,163
20	1,666,892	166,444	166,444	0	37,788	0	51,052
21	1,663,036	173,300	173,300	0	36,463	0	50,029
22	1,651,233	180,392	180,392	0	35,177	0	49,014
23	1,630,629	186,981	186,981	0	33,792	0	47,816
24	1,601,162	193,249	193,249	0	32,368	0	46,513
25	1,562,544	199,373	199,373	0	30,949	0	45,165
26	1,514,231	204,863	204,863	0	29,473	0	43,680
27	1,456,204	209,338	209,338	0	27,911	0	42,009
28	1,388,898	213,163	213,163	0	26,340	0	40,261
29	1,312,373	216,246	216,246	0	24,765	0	38,441
30	1,226,792	218,604	218,604	0	23,202	0	36,576
31	1,132,326	220,312	220,312	0	21,671	0	34,694
32	1,029,069	221,210	221,210	0	20,166	0	32,786
33	917,300	221,022	221,022	0	18,674	0	30,832
34	797,643	220,072	220,072	0	17,232	0	28,894
35	670,392	218,513	218,513	0	15,858	0	27,002
36	535,683	216,280	216,280	0	14,546	0	25,155
37	393,735	213,521	213,521	0	13,309	0	23,374
38	244,619	210,296	210,296	0	12,149	0	21,667
39	88,340	206,635	88,340	118,295	4,729	28,144	20,038
40	0	202,558	0	202,558	0	46,425	18,487
41	0	198,112	0	198,112	0	43,744	17,018
42	0	193,332	0	193,332	0	41,126	15,631
43	0	188,247	0	188,247	0	38,578	14,325
44	0	182,893	0	182,893	0	36,109	13,099
45	0	177,301	0	177,301	0	33,723	11,952
46	0	171,490	0	171,490	0	31,424	10,880
47	0	165,478	0	165,478	0	29,212	9,881
48	0	159,275	0	159,275	0	27,088	8,952
49	0	152,894	0	152,894	0	25,051	8,088
50	0	146,344	0	146,344	0	23,100	7,286

SINGLE DISCOUNT RATE DEVELOPMENT
PRESENT VALUES OF PROJECTED BENEFITS (CONTINUED)
(DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
51	$ 0	$ 139,634	$ 0	$ 139,634	$ 0	$ 21,234	$ 6,543
52	0	132,773	0	132,773	0	19,451	5,856
53	0	125,769	0	125,769	0	17,751	5,221
54	0	118,636	0	118,636	0	16,131	4,635
55	0	111,393	0	111,393	0	14,592	4,096
56	0	104,064	0	104,064	0	13,132	3,602
57	0	96,679	0	96,679	0	11,754	3,149
58	0	89,278	0	89,278	0	10,457	2,737
59	0	81,912	0	81,912	0	9,243	2,364
60	0	74,630	0	74,630	0	8,113	2,027
61	0	67,489	0	67,489	0	7,068	1,725
62	0	60,546	0	60,546	0	6,109	1,457
63	0	53,861	0	53,861	0	5,235	1,220
64	0	47,487	0	47,487	0	4,447	1,012
65	0	41,479	0	41,479	0	3,742	832
66	0	35,881	0	35,881	0	3,118	677
67	0	30,730	0	30,730	0	2,573	546
68	0	26,050	0	26,050	0	2,101	436
69	0	21,851	0	21,851	0	1,698	344
70	0	18,135	0	18,135	0	1,358	269
71	0	14,889	0	14,889	0	1,074	208
72	0	12,089	0	12,089	0	840	159
73	0	9,707	0	9,707	0	650	120
74	0	7,706	0	7,706	0	497	90
75	0	6,048	0	6,048	0	376	66
76	0	4,694	0	4,694	0	281	48
77	0	3,603	0	3,603	0	208	35
78	0	2,733	0	2,733	0	152	25
79	0	2,051	0	2,051	0	110	18
80	0	1,521	0	1,521	0	78	12
81	0	1,116	0	1,116	0	55	8
82	0	808	0	808	0	39	6
83	0	578	0	578	0	27	4
84	0	408	0	408	0	18	3
85	0	284	0	284	0	12	2
86	0	195	0	195	0	8	1
87	0	132	0	132	0	5	1
88	0	87	0	87	0	3	0
89	0	57	0	57	0	2	0
90	0	37	0	37	0	1	0
91	0	23	0	23	0	1	0
92	0	14	0	14	0	0	0
93	0	9	0	9	0	0	0
94	0	5	0	5	0	0	0
95	0	3	0	3	0	0	0
96	0	2	0	2	0	0	0
97	0	1	0	1	0	0	0
98	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
				Totals	$ 1,436,600	$ 587,467	$ 2,024,067

SECTION H

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future benefit payments at predetermined rates of interest to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

GLOSSARY OF TERMS

Amortization Payment The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

Cost-of-Living Adjustments Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan) A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.

Deferred Inflows and Outflows of Resources The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate or Single Discount Rate For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method (EAN) The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GLOSSARY OF TERMS

Fiduciary Net Position	The fiduciary net position is the value of the net assets of the trust restricted for pension benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. 68 plan members are not considered non-employer contributing entities.
Normal Cost	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.
Other Postemployment Benefits (OPEB)	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

GLOSSARY OF TERMS

Total Pension Expense

The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Changes in Benefit Terms
4. Employee Contributions
5. Projected Earnings on Plan Investments
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to the difference between expected and actual in measurement of the Total Pension Liability
9. Recognition of Outflow (Inflow) of Resources due to Assumption Changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments

Total Pension Liability (TPL)

The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL)

The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets

The valuation assets are the plan fiduciary net position used in determining the net position liability of the plan. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.

Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

STATE PATROL RETIREMENT FUND

GASB STATEMENT NOS. 67 AND 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2015

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

November 30, 2015

Minnesota State Retirement System
State Patrol Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the State Patrol Retirement Fund ("SPRF"). These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing financial reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. MSRS is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the Minnesota State Retirement System (MSRS) only in its entirety and only with the permission of MSRS.

This report is based upon information, furnished to us by MSRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not otherwise audited.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the State Patrol Retirement Fund as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

By Bonita J. Wurst
Bonita J. Wurst
ASA, EA, MAAA

By Brian B Murphy
Brian B. Murphy
FSA, EA, FCA, MAAA

OTHER OBSERVATIONS

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words of transferring the obligations to a unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

TABLE OF CONTENTS

SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

	2015
Actuarial Valuation Date	June 30, 2015
Measurement Date of the Net Pension Liability	June 30, 2015
Membership	
Number of	
- Service Retirements	816
- Survivors	154
- Disability Retirements	57
- Deferred Retirements	52
- Terminated other non-vested	17
- Active Members	843
- Total	1,939
Covered-employee Payroll [1]	$ 68,463
Net Pension Liability	
Total Pension Liability	$ 838,235
Plan Fiduciary Net Position	664,530
Net Pension Liability	$ 173,705
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	79.28%
Net Pension Liability as a Percentage of Covered-employee Payroll	253.72%
Development of the Single Discount Rate	
Single Discount Rate	7.90%
Long-Term Expected Rate of Investment Return	7.90%
Long-Term Municipal Bond Rate[2]	3.80%
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded	2115
Total Pension Expense / (Income)	$ 13,518

Deferred Outflows and Deferred Inflows of Resources by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of Total Pension Liability	$ -	$ 14,559
Changes in assumptions	20,038	-
Net difference between projected and actual earnings on pension plan investments	18,051	36,978
Totals	$ 38,089	$ 51,537

(1) *Assumed equal to actual member contributions divided by employee contribution rate.*
(2) *Based on Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 25, 2015.*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

DISCUSSION

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans,* establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions,* establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state and local governmental employers to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to SPRF subsequent to the measurement date of June 30, 2015.

The pension expense or income recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the difference between expected and actual experience in the measurement of the total pension liability, assumption changes, and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a Statement of Fiduciary Net Position and a Statement of Changes in Fiduciary Net Position in accordance with GASB Statement No. 67. The *Statement of Fiduciary Net Position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *Statement of Changes in Fiduciary Net Position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the State Patrol Retirement Fund can be found online at www.msrs.state.mn.us/financial-information or obtained from MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 55103 or requested via email at info@msrs.us or telephone at 1-800-657-5757.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

GASB Statements Nos. 67 and 68 require that an actuarial valuation to determine the total pension liability be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2015 and a measurement date of June 30, 2015.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the weekly rate closest to but not later than the measurement date of the 20-Year Bond Buyer Index a published by the Federal Reserve Board); and the resulting Single Discount Rate is 7.90%.

Effective Date and Transition

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB. MSRS first implemented GASB Statement No. 67 for fiscal year 2014.

SECTION B

FINANCIAL STATEMENTS

PENSION EXPENSE UNDER GASB STATEMENT NO. 68
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Expense

1.	Service Cost	$	16,144
2.	Interest on the Total Pension Liability		63,753
3.	Current-Period Benefit Changes		0
4.	Employee Contributions (made negative for addition here)		(9,174)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(51,467)
6.	Pension Plan Administrative Expense		170
7.	Other Changes in Plan Fiduciary Net Position		0
8.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Current Reporting Period		(2,143)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		-
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Current Reporting Period		4,513
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**21,796**
12.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Prior Reporting Periods		(962)
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		5,010
14.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Prior Reporting Periods		(12,326)
15.	**Total Pension Expense / (Income)**	**$**	**13,518**

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows (Inflows) of Resources due to Liabilities		
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$	(12,855)
2. Assumption Changes (gains) or losses	$	-
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years, rounded to the nearest whole number}		6.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	$	(2,143)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	-
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(2,143)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$	(10,712)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	-
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(10,712)
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	22,564
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	4,513
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	18,051

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS

FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Due to Liabilities	$ 5,010	$ 3,105	$ 1,905
2. Due to Assets	4,513	12,326	(7,813)
3. Total	$ 9,523	$ 15,431	$ (5,908)

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Differences between expected and actual experience	$ -	$ 3,105	$ (3,105)
2. Assumption Changes	5,010	-	5,010
3. Net Difference between projected and actual earnings on pension plan investments	$ 4,513	12,326	(7,813)
4. Total	$ 9,523	$ 15,431	$ (5,908)

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/ (Inflows) of Resources
1. Differences between expected and actual experience	$ -	$ 14,559	$ (14,559)
2. Assumption Changes	20,038	-	20,038
3. Net Difference between projected and actual earnings on pension plan investments	18,051	36,978	(18,927)
4. Total	$ 38,089	$ 51,537	$ (13,448)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows/ (Inflows) of Resources
2016	$ (5,908)
2017	(5,908)
2018	(5,908)
2019	6,416
2020	(2,140)
Thereafter	-
Total	$ (13,448)

STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

Assets		**June 30, 2015**
Cash & Short-term Investments	$	12,692
Receivables		876
Investment Pools (at fair value)		651,358
Securities Lending Collateral		67,725
Capital Assets		0
Total Assets	**$**	**732,651**
Total Deferred Outflows of Resources	**$**	**0**
Total Liabilities	**$**	**(68,121)**
Total Deferred Inflows of Resources	**$**	**0**
Net Position Restricted for Pensions	**$**	**664,530**

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

1.	**Net Position at market value at beginning of year**	**$**	**667,340**
Additions			
2.	Contributions		
	a. Employee	$	9,174
	b. Employer		13,763
	c. Other sources - Supplemental State Aid		1,000
	d. Total contributions	$	23,937
3.	Investment income		
	a. Investment income/(loss)	$	29,833
	b. Investment expenses		(930)
	c. Net investment income/(loss)	$	28,903
4.	Other Additions		-
5.	**Total Additions** *(2.d.) + (3.c.) + (4.)*	**$**	**52,840**
Deductions			
6.	Benefits Paid		
	a. Annuity benefits	$	(55,465)
	b. Refunds		(15)
	c. Total benefits paid	$	(55,480)
7.	Expenses		
	a. Other deductions	$	-
	b. Administrative		(170)
	c. Total expenses	$	(170)
8.	**Total Deductions** *(6.c.) + (7.c.)*	**$**	**(55,650)**
9.	**Net increase/(decrease) in fiduciary net position** *(5.) + (8.)*	**$**	**(2,810)**
10.	**Net Position at market value at end of year** *(1.) + (9.)*	**$**	**664,530**
11.	State Board of Investment calculated annual investment return		4.4%

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD

FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Total pension liability		
1. Service Cost	$	16,144
2. Interest on the Total Pension Liability		63,753
3. Changes of benefit terms		
4. Difference between expected and actual experience of the Total Pension Liability [(1)]		(12,855)
5. Changes of assumptions		-
6. Benefit payments, including refunds of employee contributions		(55,480)
7. Net change in total pension liability	$	11,562
8. Total pension liability – beginning		826,673
9. Total pension liability – ending	**$**	**838,235**
B. Plan fiduciary net position		
1. Contributions – employer [(2)]	$	14,763
2. Contributions – employee		9,174
3. Net investment income		28,903
4. Benefit payments, including refunds of employee contributions		(55,480)
5. Pension Plan Administrative Expense		(170)
6. Other changes		-
7. Net change in plan fiduciary net position	$	(2,810)
8. Plan fiduciary net position – beginning		667,340
9. Plan fiduciary net position – ending	**$**	**664,530**
C. Net pension liability, *A.9. - B.9.*	**$**	**173,705**
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9. / A.9.*		**79.28%**
E. Covered-employee payroll [(3)]	**$**	**68,463**
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**253.72%**

(1) Includes impact of changes in expected timing of future post-retirement benefit increases.
(2) Includes $1 million supplemental state aid.
(3) Assumed equal to actual member contributions divided by employee contribution rate.

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear (Dollars in Thousands)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal year ending June 30,	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Pension Liability										
Service Cost	$ 16,144	$ 14,514								
Interest on the Total Pension Liability	63,753	60,183								
Benefit Changes	0	0								
Difference between Expected and Actual Experience	(12,855)	(5,771)								
Assumption Changes	-	30,058								
Benefit Payments	(55,465)	(53,697)								
Refunds	(15)	(25)								
Net Change in Total Pension Liability	$ 11,562	$ 45,262								
Total Pension Liability - Beginning	826,673	781,411								
Total Pension Liability - Ending (a)	**$ 838,235**	**$ 826,673**								
Plan Fiduciary Net Position										
Employer Contributions [1]	$ 14,763	$ 12,894								
Employee Contributions	9,174	7,930								
Pension Plan Net Investment Income	28,903	107,187								
Benefit Payments	(55,465)	(53,697)								
Refunds	(15)	(25)								
Pension Plan Administrative Expense	(170)	(150)								
Other	0	0								
Net Change in Plan Fiduciary Net Position	**$ (2,810)**	**$ 74,139**								
Plan Fiduciary Net Position - Beginning	**667,340**	**593,201**								
Plan Fiduciary Net Position - Ending (b)	**$ 664,530**	**$ 667,340**								
Net Pension Liability - Ending (a) - (b)	**$ 173,705**	**$ 159,333**								
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**79.28 %**	**80.73 %**								
Covered-Employee Payroll [2]	**$ 68,463**	**$ 63,952**								
Net Pension Liability as a Percentage of Covered-Employee Payroll	**253.72 %**	**249.15 %**								

Notes to Schedule:

(1) Includes $1 million supplemental state aid.

(2) Assumed equal to actual member contributions divided by employee contribution rate.

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF THE NET PENSION LIABILITY MULTIYEAR
(DOLLARS IN THOUSANDS)
Last 10 Fiscal Years (which will be built prospectively)

Fiscal Year Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered-Employee Payroll	Net Pension Liability as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(b) / (c)	(d)	(c) / (d)
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 826,673	$ 667,340	$ 159,333	80.73%	$ 63,952	249.14%
2015	838,235	664,530	173,705	79.28%	68,463	253.72%

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULE OF CONTRIBUTIONS MULTIYEAR (DOLLARS IN THOUSANDS)
Last 10 Fiscal Years

Fiscal Year Ending June 30,	Actuarially Determined Contribution (1)	Actual Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll	Actual Contribution as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b) / (d)
2006	$ 6,741	$ 7,055	$ (314)	$ 57,765	12.21%
2007	11,427	7,461	3,966	61,498	12.13
2008	12,355	8,279	4,076	60,029	13.79
2009	14,999	9,178	5,821	61,511	14.92
2010	17,410	10,104	7,306	63,250	15.97
2011	14,826	9,873	4,953	63,250	15.61
2012	14,912	11,620	3,292	62,524 (2)	18.58
2013	18,711	11,482	7,229	62,121 (2)	18.48
2014	18,444	12,894 (3)	5,550	63,952 (2)	20.16
2015	20,648	14,763 (3)	5,885	68,463 (2)	21.56

NOTES TO SCHEDULE OF CONTRIBUTIONS

Valuation Date:	June 30, 2015
Notes	(1) Actuarially determined contribution rates are calculated as of each July 1 and apply to the fiscal year beginning on the measurement date. (2) Assumed equal to actual member contributions divided by employee contribution rate. (3) Includes supplemental state aid of $1,000.
Methods and Assumptions Used to Determine Contribution Rates Reported in this Schedule:	
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	22 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Salary Increases	Service based tables ranging from 7.75% with one year of service to 3.75% with 21 or more years of service, including inflation
Investment Rate of Return	8.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study of the period 2006 - 2011, prepared by a former actuary.
Healthy Post-retirement Mortality	RP-2000 annuitant generational mortality table, projected with mortality improvement scale AA, white collar adjustment, set back two years for males and set forward one year for females.
Other Information:	
Benefit Increases After Retirement	The post-retirement benefit increase is assumed to increase from 1.0% to 1.5% beginning January 1, 2032 and from 1.5% to 2.5% beginning January 1, 2053. See separate funding actuarial valuation report as of July 1, 2015 for additional detail. To obtain this report, contact MSRS as noted on page 3. The report is also available online at www.msrs.state.mn.us/actuarial-reports.

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	18.69 %
2015	4.46 %

[1] *Annual money-weighted rate of return, net of investment expenses.*

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

Rate of Return

For the fiscal year ended June 30, 2015, the annual money-weighted rate of return for the State Patrol Retirement Fund was 4.46%. The money-weighted rate of return is a method of calculating period-by-period returns on pension plan investments that adjusts for the changing amounts actually invested. For purposes of this schedule, the money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

10-Year Schedule of Money-Weighted Investment Return

Ten-year data is not available. Additional years will be provided when they become available.

To request additional information about the computation of the annual money-weighted rate of return and the investments for the Minnesota Retirement Systems (including the investments for MSRS' defined benefit retirement funds), contact SBI at 60 Empire Drive, Suite 355, St. Paul, Minnesota, 55103, via email at minn.sbi@state.mn.us or telephone at (651) 296-3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

ASSET ALLOCATION

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Best estimates for expected future real rates of return (expected returns, net of inflation) were developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce a geometric, long-term expected rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each major asset class that is included in the pension fund's target asset allocation as of June 30, 2015, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	45.00%	5.50%
International Stocks	15.00%	6.00%
Bonds	18.00%	1.45%
Alternative Assets	20.00%	6.40%
Unallocated Cash	2.00%	0.50%
Total	100.00%	

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

At MSRS' direction, for purposes of this valuation, the long-term expected rate of return assumption is 7.90%. This assumption is based on a review of inflation and investment return assumptions dated September 11, 2014.

Single Discount Rate

A Single Discount Rate of 7.90% was used to measure the total pension liability. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.90%. The projection of cash flows used to determine this Single Discount Rate assumed that employee and employer contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 7.90%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower (6.9%) or one percent higher (8.9%):

Sensitivity of Net Pension Liability
to the Single Discount Rate Assumption
(Dollars in Thousands)

	1% Decrease 6.90%	Current Single Discount Rate Assumption 7.90%	1% Increase 8.90%
Total Pension Liability	$ 935,477	$ 838,235	$ 757,106
Net Position Restricted for Pensions	664,530	664,530	664,530
Net Pension Liability	**$270,947**	**$173,705**	**$ 92,576**

For more information on the calculation of the single discount rate, refer to Section G of this report.

GASB Statement No. 68 Reconciliation (Dollars in Thousands)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Total Pension Expense
Balance Beginning of Year	**$ 826,673**	**$ 667,340**	**$ 159,333**	**$ 25,048**	**$ 54,113**	
Changes for the Year:						
Service Cost	$ 16,144		$ 16,144			$ 16,144
Interest on Total Pension Liability	63,753		63,753			63,753
Interest on Fiduciary Net Position [1]		$ 51,467	(51,467)			(51,467)
Changes in Benefit Terms						
Liability Experience Gains and Losses	(12,855)		(12,855)		$ 10,712	(2,143)
Changes in Assumptions	-		-		-	-
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)					(962)	(962)
Assumption Changes				$ (5,010)		5,010
Investment Gains/(Losses)					(12,326)	(12,326)
Contributions - Employer [2]		14,763	(14,763)			
Contributions - Employees		9,174	(9,174)			(9,174)
Asset Gain/(Loss) [1]		(22,564)	22,564	18,051		4,513
Benefit Payments and Refunds	(55,480)	(55,480)	-			
Administrative Expenses		(170)	170			170
Other changes		-	-			-
Net Changes	**$ 11,562**	**$ (2,810)**	**$ 14,372**	**$ 13,041**	**$ (2,576)**	**$ 13,518**
Balance End of Year	**$ 838,235**	**$ 664,530**	**$ 173,705**	**$ 38,089**	**$ 51,537**	

(1) *The sum of these items equals the net investment income of $28,903.*
(2) *Includes supplemental state aid of $1,000.*

SUMMARY OF POPULATION STATISTICS

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2014	**858**	**44**	**17**	**776**	**54**	**155**	**1,904**
New Members	56	0	0	0	0	0	**56**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	(5)	0	5	0	0	0	**0**
Service retirements	(51)	(2)	0	53	0	0	**0**
Terminated deferred	(8)	8	0	0	0	0	**0**
Terminated refund/transfer	(2)	0	(5)	0	0	0	**(7)**
Deaths	0	0	0	(15)	(2)	(9)	**(26)**
New beneficiary	0	0	0	0	0	8	**8**
Disabled	(5)	0	0	0	5	0	**0**
Unexpected status change	0	2	0	2	0	0	**4**
Net change	(15)	8	0	40	3	(1)	**35**
Members on 6/30/2015	**843**	**52**	**17**	**816**	**57**	**154**	**1,939**

SECTION E

SUMMARY OF BENEFITS

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 troopers, conservation officers, certain crime bureau and gambling enforcement officers, and certain other persons listed in Minnesota Statutes 352B.011 subdivision 10.

Contributions

Percent of Salary

Effective Date	Member	Employer
July 1, 2014 – June 30, 2016	13.40%	20.10%
July 1, 2016 and later	14.40%	21.60%

Member contributions are “picked up” according to the provisions of Internal Revenue Code 414(h).

State Contributions

$1 million paid annually on October 1 until both the Public Employees Retirement Association Police and Fire Plan and the State Patrol Retirement Fund become 90% funded (on a Market Value of Assets basis).

Allowable service

Service during which member contributions were deducted. Includes period receiving temporary Worker's Compensation and reduced salary from employer. See Normal Retirement benefit definition below for information about service limits.

Salary

Salaries excluding lump sum payments at separation.

Average salary

Average of the five highest years of Salary. Average Salary is based on all Allowable Service if less than five years. Average Salary is based on all years without regard to any service limits.

Retirement

Normal retirement benefit

Age/Service requirement: Age 55 and three years (ten years if first hired after June 30, 2013) of Allowable Service.

Amount: 3.00% of Average Salary for each year of Allowable Service up to 33 years. Members with at least 28 years of service as of July 1, 2013 are not subject to this service limit. Member contributions made after the service cap will be refunded at retirement.

Early retirement benefit

Age/Service requirement: Age 50 and three years (ten years if first hired after June 30, 2013) of Allowable Service.

Amount: Normal Retirement Benefit based on Allowable Service and Average Salary at retirement reduced by 1/10% for each month that the member is under age 55. If the effective date of retirement is after June 30, 2015, the reduction is 0.34% for each month that the member is under age 55 at the time of retirement.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Retirement (Concluded)	
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	Since January 1, 2014, benefit recipients receive annual 1.0% benefit increases. When the funding ratio reaches 85% for two consecutive years, the benefit increase will increase to 1.5%; the benefit will revert to 2.5% when the funding ratio reaches 90% for two consecutive years (actuarial accrued liability funding ratio determined using Market Value of Assets). If, after reverting to a 1.5% increase, the funding ratio declines to less than 75% for one year or 80% for two consecutive years, the benefit increase will decrease to 1.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a pro rata increase.
Disability	
Occupational disability benefit	
Age/Service requirement	Member who cannot perform his duties as a direct result of a disability relating to an act of duty.
Amount	60% of Average Salary plus 3.00% of Average Salary for each year in excess of 20 years of Allowable Service (pro rata for completed months). Payments cease at age 65 (age 55 if disabled after June 30, 2015) or 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.
Non-duty disability benefit	
Age/Service requirement	At least one year of Allowable Service and disability not related to covered employment.
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 15 years) and Average Salary at disability without reduction for commencement before age 55. Payments cease at age 65 (age 55 if disabled after June 30, 2015) or 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.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Disability (continued)	
Retirement after disability	
Age/Service requirement	Age 65 (age 55 if disabled after June 30, 2015) with continued disability.
Amount	Optional annuity continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.

Death	
Surviving spouse benefit	
Age/Service requirement	Member who is active or receiving a disability benefit or former member.
Amount	50% of Average Salary if member was active or occupational disability and either had less than three years (five years if first hired after June 30, 2013) of Allowable Service or was under age 55. Annuity is paid for life. Surviving spouse receives the 100% joint and survivor benefit commencing on the member's 55th birthday if member was active or a disability with three years (five years if first hired after June 30, 2013) of Allowable Service. A spouse who had been receiving the 50% benefit shall be entitled to the greater benefit. The surviving spouse of a former member receives the 100% joint and survivor benefit commencing on the member's 55th birthday if former member had three years (five years if first hired after June 30, 2013) of Allowable Service.
Benefit increases	Same as for retirement.
Surviving dependent children's benefit	
Age/Service requirement	Member who is active or receiving a disability benefit. Child must be unmarried, under age 18 (or 23 if full-time student) and dependent upon the member.
Amount	10% of Average Salary for each child and $20 per month prorated among all dependent children. Benefit must not be less than 50% nor exceed 70% of Average Salary.
Benefit increases	Same as for retirement.
Refund of contributions	
Age/Service requirement	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	Member contributions with 6.00% interest compounded daily until June 30, 2011 and 4.00% thereafter.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Termination	
Refund of contributions	
Age/service requirement	Termination of state service.
Amount	Member contributions with 6.00% interest compounded daily to June 30, 2011 and 4.00% thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund.
Deferred benefit	
Age/service requirement	Three years (ten years if first hired after June 30, 2013) of Allowable Service.
Amount	Benefit is 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, 2012; and (d.) 2.00% after December 31, 2011 until the annuity begins. Amount is payable at normal or early retirement. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Optional form conversion factors	Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, set back two years for males and set forward one year for females, blended 95% 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; and (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.

SUMMARY OF PLAN PROVISIONS (CONCLUDED)

Contribution stabilizer	The following is a summary of the contribution stabilizer provisions in Minnesota Statute 352.045: • If a contribution sufficiency of at least 2.0% exists, member and employer contributions may be adjusted by the Board of Directors to a level necessary to maintain a 2.0% sufficiency. Member and employer contributions may not be less than the sum of normal cost and administrative expenses. Employer contributions must be equal to 60% of the sum of member and employer contributions. • If a contribution deficiency of at least 0.5% exists, member and employer contribution rates may be increased by the Board of Directors to eliminate the deficiency. Employer contributions must be equal to 60% of the sum of member and employer contributions. • Any adjustment to the contribution rates must be reported to the Legislative Commission on Pensions and Retirement (LCPR) by January 15 following the most recent valuation report. If the LCPR does not recommend against or alter the change in rates, the adjustment becomes effective on the first day of the first full payroll period of the next fiscal year.
Changes in plan provisions	The Contribution Stabilizer statutes were revised to make changes to contribution rates less prescriptive and more flexible. Effective July 1, 2015, a provision was added so that if the 1.5% post-retirement benefit increase is triggered and the funding ratio (determined on a market value of assets basis) subsequently drops below 75% for one year or 80% for two consecutive years, the post-retirement benefit increase will change to 1.5% until the plan again reaches an 85% funding ratio for two consecutive years. The age that disabilitants change from disabled status to retired status changed from age 65 to age 55 for disabilities after June 30, 2015.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

ACTUARIAL METHODS

Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an **Individual Entry-Age Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement;

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Total Pension Liability.

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 1.0% post-retirement benefit increase. If the funding ratio (based on the market value of assets) reaches 85% (based on a 1.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will increase to 1.5%; if the funding ratio reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase revert to 2.5%. If, after reverting to a 1.5% benefit increase, the funding ratio declines to less than 75% for one year or less than 80% for two consecutive years, the benefit increase will decrease to 1.0%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns of 7.90%
- Liabilities and normal cost based on statutory funding assumptions
  - Discount rate of 8.00%
  - Statutory salary increases (rate of 7.75% at year 1 declining to 3.75% at years 21 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 1.00% per year until the funding ratio threshold required to pay a 1.50% postretirement benefit increase is reached and is then assumed to be 1.50% until the threshold required to pay a 2.50% post-retirement increase is reached.
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by MSRS.

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay 1.50% postretirement benefit increase in the year 2031 and 2.5% in 2052, and that the plan would begin paying 1.50% benefit increases on January 1, 2032 and 2.50% on January 1, 2053. This assumption is reflected in our calculations.

Decrement Timing

All decrements are assumed to occur mid-year.

Asset Valuation Method

Fair value of assets.

SUMMARY OF ACTUARIAL ASSUMPTIONS

The following assumptions were used in valuing the liabilities and benefits under the plan. The demographic assumptions are based on the last experience study, dated February 2012, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014.

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	7.90% per annum
Single discount rate	7.90% per annum.
Benefit increases after retirement	1.00% per annum through 2031, 1.50% per annum from 2032 to 2052, and 2.5% per annum thereafter
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.
Inflation	2.75% per year.
Payroll growth	3.50% 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 back two years for males and set forward 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 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back two years for males and set forward one year for females.
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.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

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 — 5% 2 — 2% 3 — 2%
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	For purposes of the Projection of Plan Fiduciary Net Position, total prior year administrative expenses expressed as a percentage of prior year projected payroll are assumed to increase 3.50% per year and are allocated to the closed group based on the ratio of closed group payroll to total 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 two years younger than their male spouses.
Eligible children	Each member may have two dependent children depending on member's age. Assumed first born child born at member's age 28 and second born child at member's age 31.
Form of payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 15% elect 50% Joint & Survivor option 25% elect 75% Joint & Survivor option 35% elect 100% Joint & Survivor option Females: 25% elect 50% Joint & Survivor option 30% elect 75% Joint & Survivor option 5% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option.
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.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by MSRS. 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 no members reported with missing salary and no members reported with missing service. <u>Data for terminated members</u>: There was 1 member reported without a benefit. We calculated benefits for this member using the reported Credited Service and Termination Date. Average Salary was not reported, so we assumed a value of $35,000. <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 5 retirees reported with a bounce back 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. There were 10 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e. “bounce back”), if applicable. For retirees that elected a survivor benefit option, we used the valuation assumptions if the survivor date of birth was missing or invalid (227 members) and/or the survivor gender was missing or invalid (211 members).
Changes in actuarial assumptions	The assumed post-retirement benefit increase rate was changed from 1.0% per year through 2018, 1.5% per year from 2019 to 2045, and 2.5% per year thereafter to 1.0% per year through 2031, 1.5% per year from 2032 to 2052, and 2.5% thereafter. For accounting purposes, this change was treated as a difference between expected and actual experience.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

	Rate (%)*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality*	
Age	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
20	0.03%	0.02%	0.03%	0.02%	0.03%	0.02%
25	0.04	0.02	0.04	0.02	0.04	0.02
30	0.04	0.03	0.04	0.03	0.04	0.03
35	0.05	0.05	0.06	0.05	0.05	0.05
40	0.08	0.07	0.09	0.06	0.08	0.07
45	0.11	0.11	0.13	0.10	0.11	0.11
50	0.17	0.25	0.20	0.16	0.17	0.25
55	0.57	0.39	0.27	0.24	0.57	0.39
60	0.57	0.61	0.43	0.38	0.57	0.61
65	0.92	1.01	0.67	0.59	0.92	1.01
70	1.58	1.69	0.98	0.88	1.58	1.69

* *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	1.47%	1.47%	0.03%	0.03%
25	1.13	1.13	0.05	0.05
30	0.80	0.80	0.06	0.06
35	0.47	0.47	0.09	0.09
40	0.40	0.40	0.14	0.14
45	0.40	0.40	0.23	0.23
50	0.00	0.00	0.40	0.40
55	0.00	0.00	0.70	0.70
60	0.00	0.00	1.13	1.13
65	0.00	0.00	0.00	0.00

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

Age	Retirement
50	7 %
51	6
52	6
53	6
54	3
55	65
56	50
57	30
58	20
59	20
60+	100

Salary Scale	
Year	Increase
1	7.75%
2	7.25
3	6.75
4	6.50
5	6.25
6	6.00
7	5.75
8	5.60
9	5.45
10	5.30
11	5.15
12	5.00
13	4.85
14	4.70
15	4.55
16	4.40
17	4.25
18	4.10
19	3.95
20	3.80
21+	3.75

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Fiduciary Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term expected rate of return is used as the discount rate. In years where assets are not projected to be sufficient to meet benefit payments, the use of a “risk-free” municipal rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the plan fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board (FRB)) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the FRB rate as of June 25, 2015). The Plan’s Fiduciary Net Position was projected to be available to meet all projected future benefit payments of current active and inactive employees. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability. **The resulting single discount rate as of July 1, 2015 is 7.90%.**

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate. It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions				
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Additional State Contributions	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)	(g)	(h) = (d) + (e) + (f) + (g)
0	$ 68,463		$ 68,463					
1	69,856		69,856	$ 9,361	$ 14,041		$ 1,000	$ 24,402
2	69,189	$ 3,112	72,301	9,963	14,945	$ 375	1,000	25,283
3	68,406	6,426	74,832	9,851	14,776	774	1,000	25,401
4	67,948	9,503	77,451	9,785	14,677	1,145	1,000	25,607
5	67,434	12,728	80,162	9,710	14,566	1,534	1,000	25,810
6	66,820	16,147	82,967	9,622	14,433	1,946	1,000	26,001
7	66,373	19,498	85,871	9,558	14,337	2,350	1,000	26,245
8	65,560	23,317	88,877	9,441	14,161	2,810	1,000	26,412
9	64,086	27,901	91,987	9,228	13,843	3,362	1,000	26,433
10	62,091	33,116	95,207	8,941	13,412	3,991	1,000	26,344
11	59,711	38,828	98,539	8,598	12,898	4,679	1,000	26,175
12	57,304	44,684	101,988	8,252	12,378	5,384	1,000	26,014
13	54,567	50,991	105,558	7,858	11,786	6,144	1,000	25,788
14	51,447	57,805	109,252	7,408	11,113	6,966	1,000	25,487
15	48,232	64,844	113,076	6,945	10,418	7,814	1,000	25,177
16	44,950	72,084	117,034	6,473	9,709	8,686	1,000	24,868
17	41,580	79,550	121,130	5,988	8,981	9,586	1,000	24,555
18	38,150	87,219	125,369	5,494	8,240	10,510	1,000	24,244
19	34,926	94,831	129,757	5,029	7,544	11,427	1,000	24,000
20	31,743	102,556	134,299	4,571	6,856	12,358	1,000	23,785
21	28,562	110,437	138,999	4,113	6,169	13,308	1,000	23,590
22	25,584	118,280	143,864	3,684	5,526	14,253	1,000	23,463
23	22,912	125,988	148,900	3,299	4,949	15,182	1,000	23,430
24	20,341	133,770	154,111	2,929	4,394	16,119	1,000	23,442
25	17,497	142,008	159,505	2,520	3,779	17,112	1,000	23,411
26	14,592	150,496	165,088	2,101	3,152	18,135	1,000	23,388
27	11,712	159,154	170,866	1,687	2,530	19,178	1,000	23,395
28	9,124	167,722	176,846	1,314	1,971	20,210	1,000	23,495
29	7,054	175,982	183,036	1,016	1,524	21,206	1,000	23,746
30	5,211	184,231	189,442	750	1,126	22,200	1,000	24,076
31	3,443	192,629	196,072	496	744	23,212	1,000	24,452
32	2,024	200,911	202,935	291	437	24,210	1,000	24,938
33	1,154	208,884	210,038	166	249	25,170	1,000	25,585
34	655	216,734	217,389	94	141	26,116	1,000	26,351
35	375	224,623	224,998	54	81	27,067	1,000	27,202
36	184	232,688	232,872	27	40	28,039	1,000	28,106
37	70	240,953	241,023	10	15	29,035	1,000	29,060
38	23	249,436	249,459	3	5	30,057	1,000	30,065
39	3	258,187	258,190	-	1	31,111	0	31,112
40	0	267,226	267,226	0	0	32,201	0	32,201
41	0	276,579	276,579	0	0	33,328	0	33,328
42	0	286,260	286,260	0	0	34,494	0	34,494
43	0	296,279	296,279	0	0	35,702	0	35,702
44	0	306,649	306,649	0	0	36,951	0	36,951
45	0	317,381	317,381	0	0	38,244	0	38,244
46	0	328,490	328,490	0	0	39,583	0	39,583
47	0	339,987	339,987	0	0	40,968	0	40,968
48	0	351,886	351,886	0	0	42,402	0	42,402
49	0	364,202	364,202	0	0	43,886	0	43,886
50	0	376,949	376,949	0	0	45,422	0	45,422

**Contributions related to future employees in excess of normal cost and expenses of 23.95% of pay.*

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (CONTINUED) (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions				
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Additional State Contributions	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)	(g)	(h) = (d) + (e) + (f) + (g)
51	$ 0	$ 390,143	$ 390,143	$ 0	$ 0	$ 47,012	$ 0	$ 47,012
52	0	403,798	403,798	0	0	48,658	0	48,658
53	0	417,930	417,930	0	0	50,361	0	50,361
54	0	432,558	432,558	0	0	52,123	0	52,123
55	0	447,698	447,698	0	0	53,948	0	53,948
56	0	463,367	463,367	0	0	55,836	0	55,836
57	0	479,585	479,585	0	0	57,790	0	57,790
58	0	496,370	496,370	0	0	59,813	0	59,813
59	0	513,743	513,743	0	0	61,906	0	61,906
60	0	531,724	531,724	0	0	64,073	0	64,073
61	0	550,335	550,335	0	0	66,315	0	66,315
62	0	569,596	569,596	0	0	68,636	0	68,636
63	0	589,532	589,532	0	0	71,039	0	71,039
64	0	610,166	610,166	0	0	73,525	0	73,525
65	0	631,522	631,522	0	0	76,098	0	76,098
66	0	653,625	653,625	0	0	78,762	0	78,762
67	0	676,502	676,502	0	0	81,518	0	81,518
68	0	700,179	700,179	0	0	84,372	0	84,372
69	0	724,686	724,686	0	0	87,325	0	87,325
70	0	750,050	750,050	0	0	90,381	0	90,381
71	0	776,301	776,301	0	0	93,544	0	93,544
72	0	803,472	803,472	0	0	96,818	0	96,818
73	0	831,593	831,593	0	0	100,207	0	100,207
74	0	860,699	860,699	0	0	103,714	0	103,714
75	0	890,824	890,824	0	0	107,344	0	107,344
76	0	922,002	922,002	0	0	111,101	0	111,101
77	0	954,273	954,273	0	0	114,990	0	114,990
78	0	987,672	987,672	0	0	119,014	0	119,014
79	0	1,022,241	1,022,241	0	0	123,180	0	123,180
80	0	1,058,019	1,058,019	0	0	127,491	0	127,491
81	0	1,095,050	1,095,050	0	0	131,953	0	131,953
82	0	1,133,376	1,133,376	0	0	136,572	0	136,572
83	0	1,173,045	1,173,045	0	0	141,352	0	141,352
84	0	1,214,101	1,214,101	0	0	146,299	0	146,299
85	0	1,256,595	1,256,595	0	0	151,420	0	151,420
86	0	1,300,576	1,300,576	0	0	156,719	0	156,719
87	0	1,346,096	1,346,096	0	0	162,205	0	162,205
88	0	1,393,209	1,393,209	0	0	167,882	0	167,882
89	0	1,441,971	1,441,971	0	0	173,758	0	173,758
90	0	1,492,440	1,492,440	0	0	179,839	0	179,839
91	0	1,544,676	1,544,676	0	0	186,133	0	186,133
92	0	1,598,739	1,598,739	0	0	192,648	0	192,648
93	0	1,654,695	1,654,695	0	0	199,391	0	199,391
94	0	1,712,610	1,712,610	0	0	206,369	0	206,369
95	0	1,772,551	1,772,551	0	0	213,592	0	213,592
96	0	1,834,590	1,834,590	0	0	221,068	0	221,068
97	0	1,898,801	1,898,801	0	0	228,806	0	228,806
98	0	1,965,259	1,965,259	0	0	236,814	0	236,814
99	0	2,034,043	2,034,043	0	0	245,102	0	245,102
100	0	2,105,234	2,105,234	0	0	253,681	0	253,681

**Contributions related to future employees in excess of normal cost and expenses of 23.95% of pay.*

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	$ 664,530	$ 24,402	$ 57,225	$ 175	$ 51,219	$ 682,751
2	682,751	25,283	58,817	173	52,670	701,714
3	701,714	25,401	60,206	171	54,198	720,936
4	720,936	25,607	61,480	170	55,754	740,647
5	740,647	25,810	62,923	169	57,342	760,707
6	760,707	26,001	64,336	167	58,959	781,164
7	781,164	26,245	65,637	166	60,613	802,219
8	802,219	26,412	67,067	164	62,306	823,706
9	823,706	26,433	68,724	160	64,020	845,275
10	845,275	26,344	70,599	155	65,727	866,592
11	866,592	26,175	72,596	149	67,406	887,428
12	887,428	26,014	74,639	143	69,046	907,706
13	907,706	25,788	76,896	136	70,631	927,093
14	927,093	25,487	79,221	129	72,140	945,370
15	945,370	25,177	81,628	121	73,558	962,356
16	962,356	24,868	84,011	112	74,874	977,975
17	977,975	24,555	86,811	104	76,067	991,682
18	991,682	24,244	89,587	95	77,110	1,003,354
19	1,003,354	24,000	92,102	87	78,004	1,013,169
20	1,013,169	23,785	94,511	79	78,757	1,021,121
21	1,021,121	23,590	96,802	71	79,368	1,027,206
22	1,027,206	23,463	98,914	64	79,841	1,031,532
23	1,031,532	23,430	100,705	57	80,192	1,034,392
24	1,034,392	23,442	102,312	51	80,435	1,035,906
25	1,035,906	23,411	104,058	44	80,565	1,035,780
26	1,035,780	23,388	105,831	36	80,565	1,033,866
27	1,033,866	23,395	107,579	29	80,425	1,030,078
28	1,030,078	23,495	108,954	23	80,156	1,024,752
29	1,024,752	23,746	109,825	18	79,790	1,018,445
30	1,018,445	24,076	110,477	13	79,359	1,011,390
31	1,011,390	24,452	110,989	9	78,875	1,003,719
32	1,003,719	24,938	111,091	5	78,363	995,924
33	995,924	25,585	110,628	3	77,870	988,748
34	988,748	26,351	109,732	2	77,446	982,811
35	982,811	27,202	108,560	1	77,135	978,587
36	978,587	28,106	107,196	0	76,968	976,465
37	976,465	29,060	105,623	0	76,977	976,879
38	976,879	30,065	104,438	0	77,174	979,680
39	979,680	31,112	103,600	0	77,509	984,701
40	984,701	32,201	102,628	0	77,985	992,259
41	992,259	33,328	101,517	0	78,669	1,002,739
42	1,002,739	34,494	100,256	0	79,591	1,016,568
43	1,016,568	35,702	98,838	0	80,785	1,034,217
44	1,034,217	36,951	97,259	0	82,289	1,056,198
45	1,056,198	38,244	95,508	0	84,143	1,083,077
46	1,083,077	39,583	93,573	0	86,394	1,115,481
47	1,115,481	40,968	91,450	0	89,089	1,154,088
48	1,154,088	42,402	89,130	0	92,285	1,199,645
49	1,199,645	43,886	86,603	0	96,039	1,252,967
50	1,252,967	45,422	83,867	0	100,417	1,314,939

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION (CONTINUED)
(DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	$ 1,314,939	$ 47,012	$ 80,925	$ 0	$ 105,489	$ 1,386,515
52	1,386,515	48,658	77,783	0	111,329	1,468,719
53	1,468,719	50,361	74,452	0	118,018	1,562,646
54	1,562,646	52,123	70,948	0	125,642	1,669,463
55	1,669,463	53,948	67,295	0	134,293	1,790,409
56	1,790,409	55,836	63,523	0	144,067	1,926,789
57	1,926,789	57,790	59,657	0	155,066	2,079,988
58	2,079,988	59,813	55,728	0	167,400	2,251,473
59	2,251,473	61,906	51,770	0	181,182	2,442,791
60	2,442,791	64,073	47,808	0	196,533	2,655,589
61	2,655,589	66,315	43,864	0	213,584	2,891,624
62	2,891,624	68,636	39,965	0	232,472	3,152,767
63	3,152,767	71,039	36,137	0	253,343	3,441,012
64	3,441,012	73,525	32,400	0	276,356	3,758,493
65	3,758,493	76,098	28,779	0	301,677	4,107,489
66	4,107,489	78,762	25,307	0	329,485	4,490,429
67	4,490,429	81,518	22,012	0	359,972	4,909,907
68	4,909,907	84,372	18,916	0	393,341	5,368,704
69	5,368,704	87,325	16,047	0	429,812	5,869,794
70	5,869,794	90,381	13,429	0	469,618	6,416,364
71	6,416,364	93,544	11,074	0	513,011	7,011,845
72	7,011,845	96,818	8,993	0	560,261	7,659,931
73	7,659,931	100,207	7,189	0	611,661	8,364,610
74	8,364,610	103,714	5,655	0	667,526	9,130,195
75	9,130,195	107,344	4,375	0	728,198	9,961,362
76	9,961,362	111,101	3,330	0	794,046	10,863,179
77	10,863,179	114,990	2,496	0	865,473	11,841,146
78	11,841,146	119,014	1,842	0	942,913	12,901,231
79	12,901,231	123,180	1,340	0	1,026,841	14,049,912
80	14,049,912	127,491	961	0	1,117,769	15,294,211
81	15,294,211	131,953	679	0	1,216,252	16,641,737
82	16,641,737	136,572	474	0	1,322,894	18,100,729
83	18,100,729	141,352	327	0	1,438,345	19,680,099
84	19,680,099	146,299	223	0	1,563,311	21,389,486
85	21,389,486	151,420	150	0	1,698,554	23,239,310
86	23,239,310	156,719	100	0	1,844,897	25,240,826
87	25,240,826	162,205	65	0	2,003,231	27,406,197
88	27,406,197	167,882	42	0	2,174,516	29,748,553
89	29,748,553	173,758	27	0	2,359,790	32,282,074
90	32,282,074	179,839	17	0	2,560,174	35,022,070
91	35,022,070	186,133	11	0	2,776,878	37,985,070
92	37,985,070	192,648	7	0	3,011,208	41,188,919
93	41,188,919	199,391	4	0	3,264,573	44,652,879
94	44,652,879	206,369	2	0	3,538,497	48,397,743
95	48,397,743	213,592	1	0	3,834,621	52,445,955
96	52,445,955	221,068	1	0	4,154,719	56,821,741
97	56,821,741	228,806	0	0	4,500,706	61,551,253
98	61,551,253	236,814	0	0	4,874,648	66,662,715
99	66,662,715	245,102	0	0	5,278,775	72,186,592
100	72,186,592	253,681	0	0	5,715,493	78,155,766

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PRESENT VALUES OF PROJECTED BENEFITS (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
1	$ 664,530	$ 57,225	$ 57,225	$ 0	$ 55,090	$ 0	$ 55,090
2	682,751	58,817	58,817	0	52,477	0	52,477
3	701,714	60,206	60,206	0	49,783	0	49,783
4	720,936	61,480	61,480	0	47,115	0	47,115
5	740,647	62,923	62,923	0	44,690	0	44,690
6	760,707	64,336	64,336	0	42,348	0	42,348
7	781,164	65,637	65,637	0	40,041	0	40,041
8	802,219	67,067	67,067	0	37,918	0	37,918
9	823,706	68,724	68,724	0	36,010	0	36,010
10	845,275	70,599	70,599	0	34,284	0	34,284
11	866,592	72,596	72,596	0	32,673	0	32,673
12	887,428	74,639	74,639	0	31,133	0	31,133
13	907,706	76,896	76,896	0	29,726	0	29,726
14	927,093	79,221	79,221	0	28,382	0	28,382
15	945,370	81,628	81,628	0	27,104	0	27,104
16	962,356	84,011	84,011	0	25,853	0	25,853
17	977,975	86,811	86,811	0	24,758	0	24,758
18	991,682	89,587	89,587	0	23,679	0	23,679
19	1,003,354	92,102	92,102	0	22,562	0	22,562
20	1,013,169	94,511	94,511	0	21,457	0	21,457
21	1,021,121	96,802	96,802	0	20,368	0	20,368
22	1,027,206	98,914	98,914	0	19,288	0	19,288
23	1,031,532	100,705	100,705	0	18,200	0	18,200
24	1,034,392	102,312	102,312	0	17,137	0	17,137
25	1,035,906	104,058	104,058	0	16,153	0	16,153
26	1,035,780	105,831	105,831	0	15,225	0	15,225
27	1,033,866	107,579	107,579	0	14,344	0	14,344
28	1,030,078	108,954	108,954	0	13,463	0	13,463
29	1,024,752	109,825	109,825	0	12,577	0	12,577
30	1,018,445	110,477	110,477	0	11,726	0	11,726
31	1,011,390	110,989	110,989	0	10,918	0	10,918
32	1,003,719	111,091	111,091	0	10,127	0	10,127
33	995,924	110,628	110,628	0	9,347	0	9,347
34	988,748	109,732	109,732	0	8,592	0	8,592
35	982,811	108,560	108,560	0	7,878	0	7,878
36	978,587	107,196	107,196	0	7,210	0	7,210
37	976,465	105,623	105,623	0	6,584	0	6,584
38	976,879	104,438	104,438	0	6,033	0	6,033
39	979,680	103,600	103,600	0	5,547	0	5,547
40	984,701	102,628	102,628	0	5,092	0	5,092
41	992,259	101,517	101,517	0	4,668	0	4,668
42	1,002,739	100,256	100,256	0	4,273	0	4,273
43	1,016,568	98,838	98,838	0	3,904	0	3,904
44	1,034,217	97,259	97,259	0	3,560	0	3,560
45	1,056,198	95,508	95,508	0	3,240	0	3,240
46	1,083,077	93,573	93,573	0	2,942	0	2,942
47	1,115,481	91,450	91,450	0	2,665	0	2,665
48	1,154,088	89,130	89,130	0	2,407	0	2,407
49	1,199,645	86,603	86,603	0	2,168	0	2,168
50	1,252,967	83,867	83,867	0	1,945	0	1,945

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT
PRESENT VALUES OF PROJECTED BENEFITS (CONTINUED)
(DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
51	$ 1,314,939	$ 80,925	$ 80,925	$ 0	$ 1,740	$ 0	$ 1,740
52	1,386,515	77,783	77,783	0	1,550	0	1,550
53	1,468,719	74,452	74,452	0	1,375	0	1,375
54	1,562,646	70,948	70,948	0	1,214	0	1,214
55	1,669,463	67,295	67,295	0	1,067	0	1,067
56	1,790,409	63,523	63,523	0	934	0	934
57	1,926,789	59,657	59,657	0	813	0	813
58	2,079,988	55,728	55,728	0	704	0	704
59	2,251,473	51,770	51,770	0	606	0	606
60	2,442,791	47,808	47,808	0	518	0	518
61	2,655,589	43,864	43,864	0	441	0	441
62	2,891,624	39,965	39,965	0	372	0	372
63	3,152,767	36,137	36,137	0	312	0	312
64	3,441,012	32,400	32,400	0	259	0	259
65	3,758,493	28,779	28,779	0	213	0	213
66	4,107,489	25,307	25,307	0	174	0	174
67	4,490,429	22,012	22,012	0	140	0	140
68	4,909,907	18,916	18,916	0	112	0	112
69	5,368,704	16,047	16,047	0	88	0	88
70	5,869,794	13,429	13,429	0	68	0	68
71	6,416,364	11,074	11,074	0	52	0	52
72	7,011,845	8,993	8,993	0	39	0	39
73	7,659,931	7,189	7,189	0	29	0	29
74	8,364,610	5,655	5,655	0	21	0	21
75	9,130,195	4,375	4,375	0	15	0	15
76	9,961,362	3,330	3,330	0	11	0	11
77	10,863,179	2,496	2,496	0	7	0	7
78	11,841,146	1,842	1,842	0	5	0	5
79	12,901,231	1,340	1,340	0	3	0	3
80	14,049,912	961	961	0	2	0	2
81	15,294,211	679	679	0	1	0	1
82	16,641,737	474	474	0	1	0	1
83	18,100,729	327	327	0	1	0	1
84	19,680,099	223	223	0	0	0	0
85	21,389,486	150	150	0	0	0	0
86	23,239,310	100	100	0	0	0	0
87	25,240,826	65	65	0	0	0	0
88	27,406,197	42	42	0	0	0	0
89	29,748,553	27	27	0	0	0	0
90	32,282,074	17	17	0	0	0	0
91	35,022,070	11	11	0	0	0	0
92	37,985,070	7	7	0	0	0	0
93	41,188,919	4	4	0	0	0	0
94	44,652,879	2	2	0	0	0	0
95	48,397,743	1	1	0	0	0	0
96	52,445,955	1	1	0	0	0	0
97	56,821,741	0	0	0	0	0	0
98	61,551,253	0	0	0	0	0	0
99	66,662,715	0	0	0	0	0	0
100	72,186,592	0	0	0	0	0	0
				Totals	$ 987,557	$ 0	$ 987,557

For purposes of this projection, we assumed the current fixed rate contribution would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SECTION H

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future benefit payments at predetermined rates of interest to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

GLOSSARY OF TERMS

Amortization Payment — The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method — The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

Cost-of-Living Adjustments — Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan) — A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll — The payroll of covered employees, which is typically only the pensionable pay (meets the statutory salary definition) and does not include pay above any pay cap.

Deferred Inflows and Outflows of Resources — The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate or Single Discount Rate — For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method or Entry Age Normal (EAN) — The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GLOSSARY OF TERMS

Fiduciary Net Position	The fiduciary net position is the value of the net assets of the trust restricted for pension benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributing to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. 68 plan members are not considered non-employer contributing entities.
Normal Cost	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.
Other Postemployment Benefits (OPEB)	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

GLOSSARY OF TERMS

Total Pension Expense The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Changes in Benefit Terms
4. Employee Contributions
5. Projected Earnings on Plan Investments
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to the difference between expected and actual in measurement of the Total Pension Liability
9. Recognition of Outflow (Inflow) of Resources due to Assumption Changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments

Total Pension Liability (TPL) The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL) The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets The valuation assets are the plan fiduciary net position used in determining the net position liability of the plan. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.

Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

JUDGES RETIREMENT FUND

GASB STATEMENTS NO. 67 AND NO. 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2015

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

November 30, 2015

Minnesota State Retirement System
Judges Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the Judges Retirement Fund ("JRF"). These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing financial reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. MSRS is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the Minnesota State Retirement System (MSRS) in its entirety and only with the permission of MSRS.

This report is based upon information, furnished to us by MSRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not otherwise audited.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Judges Retirement Fund as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

By Brian B. Murphy
Brian B. Murphy
FSA, EA, FCA, MAAA

By Bonita J. Wurst
Bonita J. Wurst
ASA, EA, MAAA

OTHER OBSERVATIONS

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words of transferring the obligations to a unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

TABLE OF CONTENTS

SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

	2015
Actuarial Valuation Date	June 30, 2015
Measurement Date of the Net Pension Liability	June 30, 2015
Membership	
Number of	
- Service Retirements	240
- Survivors	83
- Disability Retirements	23
- Deferred Retirements	16
- Terminated other non-vested	0
- Active Members	312
- Total	674
Covered-Employee Payroll	$ 43,449 (1)
Net Pension Liability	
Total Pension Liability	$ 410,972
Plan Fiduciary Net Position	174,580
Net Pension Liability	$ 236,392
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	42.48%
Net Pension Liability as a Percentage of Covered-Employee Payroll	544.07%
Development of the Single Discount Rate	
Single Discount Rate	5.25%
Long-Term Expected Rate of Investment Return	7.90%
Long-Term Municipal Bond Rate (2)	3.80%
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded	2034
Total Pension Expense/(Income)	$ 17,706

Deferred Outflows and Deferred Inflows of Resources by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of Total Pension Liability	$ 3,048	$ 3,493
Changes in assumptions	17,357	5,050
Net difference between projected and actual earnings on pension plan investments	4,767	9,628
Total	$ 25,172	$ 18,171

(1) *Assumed equal to actual employer contributions divided by employer contribution rate.*

(2) *Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 25, 2015 (i.e., the weekly rate closest to but not later than the Measurement Date).*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

DISCUSSION

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans,* establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions,* establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state and local governmental employers to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to JRF subsequent to the measurement date of June 30, 2015.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the difference between expected and actual experience in the measurement of the Total Pension Liability, assumption changes, and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a Statement of Fiduciary Net Position and a Statement of Changes in Fiduciary Net Position in accordance with GASB Statement No. 67. The *Statement of Fiduciary Net Position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *Statement of Changes in Fiduciary Net Position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes to the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

Both GASB Statements No. 67 and No. 68 require the notes to the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with Statement No. 67. This information includes:

- the composition of the pension plan's board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the Judges Retirement Fund can be found online at www.msrs.state.mn.us/financial-information or obtained from MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 55103 or requested via email at info@msrs.us or telephone at 1-800-657-5757.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

GASB Statements Nos. 67 and 68 require that an actuarial valuation to determine the total pension liability be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2015 and a measurement date of June 30, 2015.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the weekly rate closest to but not later than the measurement date of the 20-Year Bond Buyer Index as published by the Federal Reserve Board); and the resulting single discount rate is 5.25%.

Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB. MSRS first implemented GASB Statement No. 67 for fiscal year 2014.

SECTION B

FINANCIAL STATEMENTS

PENSION EXPENSE UNDER GASB STATEMENT NO. 68
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Expense			
1.	Service Cost	$	12,251
2.	Interest on the Total Pension Liability		21,773
3.	Current-Period Benefit Changes		0
4.	Employee Contributions (made negative for addition here)		(3,629)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(13,531)
6.	Pension Plan Administrative Expense		60
7.	Other Changes in Plan Fiduciary Net Position		0
8.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Current Reporting Period		(873)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		4,339
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Current Reporting Period		1,192
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**21,582**
12.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Prior Reporting Periods		1,016
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		(1,683)
14.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Prior Reporting Periods		(3,209)
15.	**Total Pension Expense / (Income)**	**$**	**17,706**

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows (Inflows) of Resources due to Liabilities		
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$	(4,366)
2. Assumption Changes (gains) or losses	$	21,696
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		5.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	$	(873)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	4,339
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	3,466
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$	(3,493)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	17,357
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	13,864
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	5,959
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	1,192
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	4,767

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/ (Inflows) of Resources
1. Due to Liabilities	$ 5,355	$ 2,556	$ 2,799
2. Due to Assets	1,192	3,209	(2,017)
3. Total	$ 6,547	$ 5,765	$ 782

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/ (Inflows) of Resources
1. Differences between expected and actual experience	$ 1,016	$ 873	$ 143
2. Assumption Changes	4,339	1,683	2,656
3. Net Difference between projected and actual earnings on pension plan investments	1,192	3,209	(2,017)
4. Total	$ 6,547	$ 5,765	$ 782

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/ (Inflows) of Resources
1. Differences between expected and actual experience	$ 3,048	$ 3,493	$ (445)
2. Assumption Changes	17,357	5,050	12,307
3. Net Difference between projected and actual earnings on pension plan investments	4,767	9,628	(4,861)
4. Total	$ 25,172	$ 18,171	$ 7,001

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows/ (Inflows) of Resources
2016	$ 782
2017	782
2018	780
2019	4,657
2020	0
Thereafter	0
Total	$ 7,001

STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

Assets		**June 30, 2015**
Cash & Short-term Investments	$	3,911
Receivables		134
Investment Pools (at fair value)		170,655
Securities Lending Collateral		17,755
Capital Assets		0
Total Assets	**$**	**192,455**
Total Deferred Outflows of Resources	**$**	**0**
Total Liabilities	**$**	**(17,875)**
Total Deferred Inflows of Resources	**$**	**0**
Net Position Restricted for Pensions	**$**	**174,580**

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR THE FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

1. Net position at market value at beginning of year	**$**	**175,556**
Additions		
2. Contributions		
a. Employee	$	3,629
b. Employer		9,776
c. Other sources		0
d. Total contributions	$	13,405
3. Investment income		
a. Investment income/(loss)	$	7,816
b. Investment expenses		(244)
c. Net investment income/(loss)	$	7,572
4. Other Additions		0
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**20,977**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(21,893)
b. Refunds		0
c. Total benefits paid	$	(21,893)
7. Expenses		
a. Other deductions	$	0
b. Administrative		(60)
c. Total expenses	$	(60)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(21,953)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**(976)**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**174,580**
11. State Board of Investment calculated annual investment return		4.4%

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD

FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Total pension liability			
1. Service Cost	$	12,251	
2. Interest on the Total Pension Liability		21,773	
3. Changes of benefit terms		0	
4. Difference between expected and actual experience of the Total Pension Liability		(4,366)	
5. Changes of assumptions		21,696	(1)
6. Benefit payments, including refunds of employee contributions		(21,893)	
7. Net change in total pension liability	$	29,461	
8. Total pension liability – beginning		381,511	
9. Total pension liability – ending	**$**	**410,972**	
B. Plan fiduciary net position			
1. Contributions – employer	$	9,776	
2. Contributions – employee		3,629	
3. Net investment income		7,572	
4. Benefit payments, including refunds of employee contributions		(21,893)	
5. Pension Plan Administrative Expense		(60)	
6. Other changes		0	
7. Net change in plan fiduciary net position	$	(976)	
8. Plan fiduciary net position – beginning		175,556	
9. Plan fiduciary net position – ending	**$**	**174,580**	
C. Net pension liability, *A.9 - B.9.*	**$**	**236,392**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9 / A.9.*		**42.48%**	
E. Covered-employee payroll	**$**	**43,449**	(2)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**544.07%**	

(1) *Assumption changes are summarized on page 26.*
(2) *Assumed equal to actual employer contributions divided by employer contribution rate.*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear (Dollars in Thousands)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal year ending June 30,	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Pension Liability										
Service Cost	$ 12,251	$ 12,075								
Interest on the Total Pension Liability	21,773	20,535								
Benefit Changes	0	0								
Difference between Expected and Actual Experience	(4,366)	5,080								
Assumption Changes	21,696 (1)	(8,416)								
Benefit Payments	(21,893)	(20,802)								
Refunds	0	0								
Net Change in Total Pension Liability	$ 29,461	8,472								
Total Pension Liability - Beginning	381,511	373,039								
Total Pension Liability - Ending (a)	**$ 410,972**	**$ 381,511**								
Plan Fiduciary Net Position										
Employer Contributions	$ 9,776	$ 9,426								
Employee Contributions	3,629	3,578								
Pension Plan Net Investment Income	7,572	28,011								
Benefit Payments	(21,893)	(20,802)								
Refunds	0	0								
Pension Plan Administrative Expense	(60)	(55)								
Other Changes	0	0								
Net Change in Plan Fiduciary Net Position	**$ (976)**	**20,158**								
Plan Fiduciary Net Position - Beginning	**175,556**	**155,398**								
Plan Fiduciary Net Position - Ending (b)	**$ 174,580**	**$ 175,556**								
Net Pension Liability - Ending (a) - (b)	**$ 236,392**	**205,955**								
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**42.48 %**	**46.02 %**								
Covered-Employee Payroll(2)	**$ 43,449**	**$ 41,893**								
Net Pension Liability as a Percentage of Covered-Employee Payroll	**544.07 %**	**491.62 %**								

Notes to Schedule:

(1) *Assumption changes are summarized on page 26.*

(2) *Assumed equal to actual employer contributions divided by employer contribution rate.*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF NET PENSION LIABILITY MULTIYEAR (DOLLARS IN THOUSANDS)

Fiscal Year Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered-Employee Payroll	Net Pension Liability as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(b)/(c)	(d)	(c)/(d)
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 381,511	$ 175,556	$ 205,955	46.02%	$ 41,893	491.62%
2015	410,972	174,580	236,392	42.48%	43,449	544.07%

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULE OF CONTRIBUTIONS MULTIYEAR (DOLLARS IN THOUSANDS)

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Actuarially Determined Contribution [1]	Actual Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll	Actual Contributions as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b)/(d)
2006	$ 7,779	$ 7,336	$ 443	$ 36,529	20.08%
2007	8,331	7,572	759	36,195	20.92
2008	10,045	7,936	2,109	38,296	20.72
2009	8,985	8,219	766	39,444	20.84
2010	9,400	8,283	1,117	39,291	21.08
2011	9,804	8,297	1,507	40,473	20.50
2012	9,879	7,922	1,957	38,644 [2]	20.50
2013	13,524	8,177	5,347	39,888 [2]	20.50
2014	14,193	9,426	4,767	41,893 [2]	22.50
2015	14,298	9,776	4,522	43,449 [2]	22.50

NOTES TO SCHEDULE OF CONTRIBUTIONS

Valuation Date:	June 30, 2015
Notes	[1] Actuarially determined contribution rates are calculated as of each July 1 and apply to the fiscal year beginning on the measurement date. [2] Assumed equal to actual employer contributions divided by employer contribution rate.

Methods and Assumptions Used to Determine Contribution Rates Reported in this Schedule:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	24 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Salary Increases	2.75%
Investment Rate of Return	8.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study of the period 2007 - 2011, prepared by a former actuary.
Healthy Post-Retirement Mortality	RP-2000 annuitant generational mortality table, projected with mortality improvement scale AA, white collar adjustment, set back one year for males and set back two years for females.

Other Information:

Benefit Increases After Retirement	The post-retirement increase is assumed to remain at 1.75% indefinitely.

See separate funding actuarial valuation report as of July 1, 2015 for additional detail. To obtain this report, contact MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 55103 or request via email at info@msrs.us or telephone at 1-800-651-5757.

This report can be found online at www.msrs.state.mn.us/actuarial-reports.

SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[(1)]
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	18.66 %
2015	4.45 %

[(1)] *Annual money-weighted rate of return, net of investment expenses.*

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

Rate of Return

For the fiscal year ended June 30, 2015, the annual money-weighted rate of return for the Judges Retirement Fund was 4.45%. The money-weighted rate of return is a method of calculating period-by-period returns on pension plan investments that adjusts for the changing amounts actually invested. For purposes of this schedule, the money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

10-Year Schedule of Money-Weighted Investment Return

Ten-year data is not available. Additional years will be provided when they become available.

To request additional information about the computation of the annual money-weighted rate of return and the investments for the Minnesota Retirement Systems (including the investments for MSRS' defined benefit retirement funds), contact SBI at 60 Empire Drive, Suite 355, St. Paul, Minnesota, 55103, via email at minn.sbi@state.mn.us or telephone at (651) 296-3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

ASSET ALLOCATION

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Best estimates for expected future real rates of return (expected returns, net of inflation) were developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce geometric, long-term expected real rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each asset class that is included in the pension fund's target asset allocation as of June 30, 2015, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	45.00%	5.50%
International Stocks	15.00%	6.00%
Bonds	18.00%	1.45%
Alternative Assets	20.00%	6.50%
Unallocated Cash	2.00%	0.50%
Total	100.00%	

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

At MSRS' direction, for purposes of this valuation, the long-term expected rate of return assumption is 7.90%. This assumption is based on a review of inflation and investment return assumptions dated September 11, 2014.

SENSITIVITY OF NET PENSION LIABILITY TO THE SINGLE DISCOUNT RATE ASSUMPTION

Single Discount Rate

A single discount rate of 5.25% was used to measure the total pension liability. This single discount rate was based on an expected rate of return on pension plan investments of 7.90% and a municipal bond rate of 3.80%. The projection of cash flows used to determine this single discount rate assumed that plan member and employer contributions will be made at the current contribution rates. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to fully finance the benefit payments through the year ending June 30, 2034 and assets were projected to be fully depleted in the year ending June 30, 2036. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the point of asset depletion, and the municipal bond rate was applied to all benefit payments after the point of asset depletion.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the fund's net pension liability, calculated using a single discount rate of 5.25%, as well as what the fund's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower (4.25%) or 1-percentage-point higher (6.25%) than the current single discount rate:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 4.25%	Current Single Discount Rate Assumption 5.25%	1% Increase 6.25%
Total Pension Liability	$457,434	$410,972	$371,516
Net Position Restricted for Pensions	$174,580	$174,580	$174,580
Net Pension Liabitliy	**$282,854**	**$236,392**	**$196,936**

A single discount rate of 5.78% was used for the measurement date as of July 1, 2014. For more information on the calculation of the single discount rate, refer to Section G of this report.

GASB Statement No. 68 Reconciliation (Dollars in Thousands)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Total Pension Expense
Balance Beginning of Year	**$ 381,511**	**$ 175,556**	**$ 205,955**	**$ 4,064**	**$ 19,570**	
Changes for the Year:						
Service Cost	$ 12,251		$ 12,251			$ 12,251
Interest on Total Pension Liability	21,773		21,773			21,773
Interest on Plan Fiduciary Net Position (1)		$ 13,531	(13,531)			(13,531)
Changes in Benefit Terms						
Liability Experience Gains and Losses	(4,366)		(4,366)		$ 3,493	(873)
Changes in Assumptions	21,696		21,696	$ 17,357		4,339
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(1,016)		1,016
Assumption Changes					(1,683)	(1,683)
Investment Gains/(Losses)					(3,209)	(3,209)
Contributions - Employer		9,776	(9,776)			
Contributions - Employees		3,629	(3,629)			(3,629)
Asset Gain/(Loss) (1)		(5,959)	5,959	4,767		1,192
Benefit Payments and Refunds	(21,893)	(21,893)	0			
Administrative Expenses		(60)	60			60
Other Changes						
Net Changes	**$ 29,461**	**$ (976)**	**$ 30,437**	**$ 21,108**	**$ (1,399)**	**$ 17,706**
Balance End of Year	**$ 410,972**	**$ 174,580**	**$ 236,392**	**$ 25,172**	**$ 18,171**	

(1) The sum of these items equal the net investment income of $7,572.

SUMMARY OF POPULATION STATISTICS

	Actives*	Terminated: Deferred Retirement	Terminated: Other Non-Vested	Recipients: Service Retirement	Recipients: Disability Retirement	Recipients: Survivor	Total
Members on 7/1/2014	**316**	**16**	**0**	**227**	**24**	**84**	**667**
New members	16	0	0	0	0	0	**16**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	0	0	0	0	0	0	**0**
Service retirements	(20)	0	0	20	0	0	**0**
Terminated deferred	0	0	0	0	0	0	**0**
Terminated refund/transfer	0	0	0	0	0	0	**0**
Deaths	0	0	0	(7)	(1)	(4)	**(12)**
New beneficiary	0	0	0	0	0	3	**3**
Disabled	0	0	0	0	0	0	**0**
Unexpected status changes	0	0	0	0	0	0	**0**
Net change	(4)	0	0	13	(1)	(1)	**7**
Members on 6/30/2015	**312**	**16**	**0**	**240**	**23**	**83**	**674**

** Includes active Judges who have reached the maximum benefit formula (employee contributions are directed to the Unclassified Employees Retirement Plan).*

SECTION E

SUMMARY OF BENEFITS

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	A judge or justice of any court. If the member was active prior to January 1, 1974, benefits may be computed according to provisions of the prior plan.
Tier 1 / Tier 2 Member	Tier 1 includes judges or justices first appointed or elected before July 1, 2013 and Tier 2 includes judges or justices first appointed or elected after June 30, 2013. A judge or justice with less than five years of service as of December 30, 2013 may make a one-time irrevocable election into Tier 2. For the purpose of this valuation, we have assumed no Tier 1 members elected Tier 2 benefits as of the valuation date.
Contributions	
Member	9.00% of salary for Tier 1 members, 7.00% of salary for Tier 2 members. Tier 1 member contributions after maximum benefit is reached are redirected to the Unclassified Employees Retirement Plan.
Employer	22.50% of salary.
	Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
Allowable service	Service as a judge. Credit may also be earned for uncredited judicial service if the appropriate employee contributions, with interest, are made.
Salary	Salary set by law.
Average salary	Average of the five highest years of salary of the last 10 years prior to termination of judicial service.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Retirement

Normal retirement benefit

Age/Service requirement	First appointed as a judge before July 1, 2013 (Tier 1): (a.) Age 65 and five years of Allowable Service (b.) Age 70 (mandatory retirement age) First appointed as a judge after June 30, 2013 (Tier 2): (a.) Age 66 and five years of Allowable Service (b.) Age 70 (mandatory retirement age) Judges appointed before July 1, 2013 with less than five years of allowable service on or before December 31, 2013 may make a one-time election for the Tier 2 benefit package.
Amount	First appointed as a judge before July 1, 2013 (Tier 1): 2.70% of Average Salary for each year of Allowable Service prior to July 1, 1980 and 3.20% of Average Salary for each year of Allowable Service after June 30, 1980. Maximum benefit equal to 76.80% of Average Salary. First appointed as a judge after June 30, 2013 (Tier 2): 2.50% of Average Salary for each year of Allowable Service Tier 1 who elected into Tier 2: 3.20% of Average Salary for each year of Allowable Service prior to January 1, 2014 plus 2.50% of Average Salary for each year of Allowable Service after December 31, 2013.

Early retirement

Age/Service requirement	Age 60 and five years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.50% for each month the member is under Normal Retirement Age at time of retirement.
Form of payment	Life annuity. Actuarially equivalent options are: (a.) 50%,75% or 100% joint and survivor with no bounce back feature (b.) 50%, 75% or 100% bounce back feature (c.) 15-year certain and life thereafter
Benefit increases	Since January 1, 2014, benefit recipients receive annual 1.75% benefit increases. If the accrued liability funding ratio reaches 70% for two consecutive years (on a Market Value of Assets basis), the benefit increase will revert to 2.0%. If the accrued liability funding ratio reaches 90% for two consecutive years (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 the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a pro rata increase.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Disability	
Disability benefit	
Age/Service requirement	Permanent inability to perform the function of judge.
Amount	No benefit is paid by the Fund. Instead, salary is continued for one year but not beyond age 70. Employee contributions continue and Allowable Service is earned. If disability continues after the first year (or at age 70 if earlier), the larger of 25.00% of Average Salary or the Normal Retirement Benefit, without reduction.
Retirement after disability	
Age/Service requirement	Member is still disabled after salary payments cease after one year or at age 70, if earlier.
Amount	No change in disability benefit amount from pre-retirement computed benefit amount.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.
Death	
Survivor's benefit	
Age/service requirement	Active or disabled member dies before retirement or a former member eligible for a deferred annuity dies.
Amount	Larger of 25% of Average Salary or 60% of Normal Retirement Benefit earned at date of death. If member dies after age 60 with five or more years of service, spouse may receive the 100% joint and survivor benefit the member had earned as of date of death. Benefit paid to spouse for life. If no spouse, benefit is paid to surviving dependent children until child marries, dies, or attains age 18 (age 22 if full-time student).
Benefit increases	Same as for retirement.
Refund of contributions	
Age/service requirement	Member dies prior to retirement or former member eligible for a deferred annuity dies and survivors' benefits are not payable.
Amount	Member contributions with 6.00% annual interest compounded daily until June 30, 2011 and 4.00% thereafter.

SUMMARY OF PLAN PROVISIONS (CONCLUDED)

Termination	
Refund of contributions	
Age/Service requirement	Termination of service as a judge.
Amount	Member contributions with 6.00% annual interest compounded daily until June 30, 2011, 4.00% thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund.
Deferred benefit	
Age/service requirement	Five years of Allowable Service.
Amount	Benefit computed under law in effect at termination. Amount is payable at normal or early retirement. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Form of payment	Same as for retirement.
Optional form conversion factors	Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2022 using scale AA, set back one year for males and set back two years for females, blended 80% 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.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

ACTUARIAL METHODS

Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an **Individual Entry-Age Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement;

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Total Pension Liability.

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 1.75% post-retirement benefit increase. If the funding ratio (determined on a market value of assets basis) reaches 70% (based on a 2.00% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will increase to 2.00%, if the funding ratio reaches 90% (based on a 2.50% post-retirement benefit increase assumption) for two consecutive years, the benefit increase revert to 2.50%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns of 7.90%
- Liabilities and normal cost based on statutory funding assumptions
    - Discount rate of 8.00%
    - Statutory salary increases of 2.75%
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 1.75% per year until the funding ratio threshold required to pay a 2.00% postretirement benefit increase is reached and is assumed to be 2.00% per year until the threshold required to pay a 2.50% postretirement benefit increase is reached.
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by MSRS.

Based on these assumptions and methods, the projection indicates that this plan is expected to pay 1.75% postretirement benefit increases indefinitely. This assumption is reflected in our calculations.

Decrement Timing

All decrements are assumed to occur mid-year.

Asset Valuation Method

Fair value of assets.

SUMMARY OF ACTUARIAL ASSUMPTIONS

The following assumptions were used in valuing the liabilities and benefits under the plan. The demographic assumptions are based on the last experience study, dated February 2012, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014.

Investment return	7.90% per annum.
Single discount rate	5.25% per annum.
Benefit increases after retirement	1.75% per annum.
Salary increases	2.75% per year.
Payroll growth	2.75% per year.
Inflation	2.75% per year.
Mortality rates	
Healthy pre-retirement	RP-2000 employee generational mortality table projected using 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 back one year for males and set back two years 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 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back one year for males and set back two years for females.
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	None.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Disability	Age-related rates based on experience; see table of sample rates.
Administrative expenses	For purposes of the Projection of Plan Fiduciary Net Position, total prior year administrative expenses expressed as a percentage of prior year projected payroll are assumed to increase 2.75% per year and are allocated to the closed group based on the ratio of closed group payroll to total payroll.
Refund of contributions	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 65.
Percentage married	Marital status as indicated by data.
Age of spouse	Females are assumed to be three years younger than their male spouses.
Form of payment	Members are assumed to elect a life annuity.
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.
Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by MSRS. 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. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members:</u> There were 14 members who have reached the 24 year service cap; 2 of these were reported as terminated members. These members are reflected as active members in this valuation. We assumed these members earned the greater of the salary reported under the Unclassified Employees Retirement Plan or $138,318 for the July 1, 2014 to June 30, 2015 plan year. There were no members reported with missing service. There were no members reported with missing or invalid birth dates. There was 1 member reported with an invalid gender. We assumed the member was male. <u>Data for terminated members:</u> There was 1 member reported without a benefit. We calculated the benefit for this member using the reported Average Salary, Credited Service and Termination Date provided.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	Data for members receiving benefits: There were no members reported without a benefit. There were no members reported with missing or invalid birth dates or gender. There were retired members reported with a survivor option and an invalid or missing survivor gender (53 members) and/or survivor date of birth (41 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid. There were 4 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e., "bounce back"), if applicable. There were 3 retirees reported with a bounce back annuity but 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. There were no survivors reported on the data file with an expired benefit.
Changes in actuarial assumptions	The single discount rate was changed from 5.78% to 5.25%.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

	Rate (%) *					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality**	
Age	Male	Female	Male	Female	Male	Female
20	0.03%	0.02%	0.03%	0.02%	0.03%	0.02%
25	0.04	0.02	0.04	0.02	0.04	0.02
30	0.04	0.02	0.04	0.03	0.04	0.02
35	0.05	0.04	0.06	0.05	0.05	0.04
40	0.08	0.06	0.09	0.06	0.08	0.06
45	0.12	0.08	0.13	0.10	0.12	0.08
50	0.18	0.13	0.20	0.16	0.18	0.13
55	0.56	0.29	0.27	0.24	0.56	0.29
60	0.61	0.47	0.43	0.38	0.61	0.47
65	1.04	0.74	0.67	0.59	1.04	0.74
70	1.74	1.24	0.98	0.88	1.74	1.24

** 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.*

	Disability Retirement	
Age	Male	Female
20	0.00%	0.00%
25	0.00	0.00
30	0.00	0.00
35	0.01	0.00
40	0.01	0.01
45	0.02	0.03
50	0.07	0.05
55	0.17	0.12
60	0.38	0.31
65	0.00	0.00
70	0.00	0.00

Age	Retirement
60	0%
61	0
62	8
63	5
64	8
65	25
66	20
67	10
68	30
69	10
70	100

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Fiduciary Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term rate of return is used as the discount rate. In years where assets are not projected to be sufficient to meet benefit payments, the use of a “risk-free” municipal bond rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board (FRB)) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the FRB rate as of June 25, 2015). **The resulting single discount rate as of July 1, 2015 is 5.25%.**

Benefit payments projected to occur up through June 30, 2034 were fully funded and benefit payments projected to occur in the year ended June 30, 2035 were partially funded. Assets were projected to be depleted by the fiscal year ending June 30, 2035. Benefit payments were discounted using 7.9%, the expected long-term rate of return on pension plan investments, as long as assets were sufficient to fund the benefit payments. Beginning in the July 1, 2034 to June 30, 2035 fiscal year, when benefit payments exceed the Plan’s Fiduciary Net Position, benefit payments were discounted at 3.80%, the municipal bond rate. An equivalent single discount rate was determined that produced approximately the same present value of projected benefits when applied to all years of projected benefits as the present value of projected benefits using 7.90% through the point of asset depletion and 3.80% after. For calculation of the equivalent present value of projected benefits, see pages 33 and 34 of this report.

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate. It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions			
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)	(g) = (d) + (e) + (f)
0	$ 43,449		$ 43,449				
1	44,577		44,577	$ 3,718	$ 10,030		$ 13,748
2	42,713	$ 3,090	45,803	3,544	9,610	$ 366	13,520
3	40,238	6,825	47,063	3,321	9,053	812	13,186
4	38,287	10,070	48,357	3,144	8,615	1,204	12,963
5	36,454	13,233	49,687	2,977	8,202	1,589	12,768
6	34,738	16,315	51,053	2,822	7,816	1,967	12,605
7	32,879	19,578	52,457	2,657	7,398	2,370	12,425
8	30,877	23,023	53,900	2,482	6,947	2,799	12,228
9	28,815	26,567	55,382	2,303	6,483	3,244	12,030
10	26,698	30,207	56,905	2,123	6,007	3,704	11,834
11	24,792	33,678	58,470	1,961	5,578	4,147	11,686
12	23,095	36,983	60,078	1,816	5,196	4,573	11,585
13	21,345	40,385	61,730	1,669	4,803	5,014	11,486
14	19,420	44,007	63,427	1,510	4,369	5,486	11,365
15	17,313	47,859	65,172	1,339	3,895	5,991	11,225
16	15,325	51,639	66,964	1,179	3,448	6,491	11,118
17	13,625	55,180	68,805	1,042	3,066	6,964	11,072
18	12,007	58,690	70,697	913	2,702	7,437	11,052
19	10,471	62,171	72,642	792	2,356	7,910	11,058
20	9,072	65,567	74,639	682	2,041	8,376	11,099
21	7,682	69,010	76,692	574	1,728	8,851	11,153
22	6,322	72,479	78,801	470	1,422	9,333	11,225
23	5,222	75,746	80,968	386	1,175	9,793	11,354
24	4,284	78,910	83,194	315	964	10,242	11,521
25	3,438	82,044	85,482	251	774	10,691	11,716
26	2,606	85,227	87,833	189	586	11,150	11,925
27	1,955	88,293	90,248	141	440	11,596	12,177
28	1,519	91,211	92,730	109	342	12,026	12,477
29	1,104	94,176	95,280	79	248	12,465	12,792
30	754	97,147	97,901	53	170	12,908	13,131
31	443	100,150	100,593	31	100	13,359	13,490
32	238	103,121	103,359	17	53	13,808	13,878
33	132	106,070	106,202	9	30	14,203	14,242
34	44	109,078	109,122	3	10	14,606	14,619
35	0	112,123	112,123	0	0	15,013	15,013
36	0	115,206	115,206	0	0	15,426	15,426
37	0	118,375	118,375	0	0	15,850	15,850
38	0	121,630	121,630	0	0	16,286	16,286
39	0	124,975	124,975	0	0	16,734	16,734
40	0	128,411	128,411	0	0	17,194	17,194
41	0	131,943	131,943	0	0	17,667	17,667
42	0	135,571	135,571	0	0	18,153	18,153
43	0	139,299	139,299	0	0	18,652	18,652
44	0	143,130	143,130	0	0	19,165	19,165
45	0	147,066	147,066	0	0	19,692	19,692
46	0	151,111	151,111	0	0	20,234	20,234
47	0	155,266	155,266	0	0	20,790	20,790
48	0	159,536	159,536	0	0	21,362	21,362
49	0	163,923	163,923	0	0	21,949	21,949
50	0	168,431	168,431	0	0	22,553	22,553

** Contributions related to future employees in excess of normal cost and expenses. Normal cost and expenses initially total 19.04% of pay but trend down over the projection period (based on the projection assumptions) due to the recognition of lower normal costs for Judges hired after June 30, 2013.*

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF CONTRIBUTIONS (CONTINUED) (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions			
Year	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)	(g) = (d) + (e) + (f)
51	$ 0	$ 173,063	$ 173,063	$ 0	$ 0	$ 23,173	$ 23,173
52	0	177,822	177,822	0	0	23,810	23,810
53	0	182,712	182,712	0	0	24,465	24,465
54	0	187,737	187,737	0	0	25,138	25,138
55	0	192,900	192,900	0	0	25,829	25,829
56	0	198,204	198,204	0	0	26,540	26,540
57	0	203,655	203,655	0	0	27,269	27,269
58	0	209,255	209,255	0	0	28,019	28,019
59	0	215,010	215,010	0	0	28,790	28,790
60	0	220,923	220,923	0	0	29,582	29,582
61	0	226,998	226,998	0	0	30,395	30,395
62	0	233,240	233,240	0	0	31,231	31,231
63	0	239,655	239,655	0	0	32,090	32,090
64	0	246,245	246,245	0	0	32,972	32,972
65	0	253,017	253,017	0	0	33,879	33,879
66	0	259,975	259,975	0	0	34,811	34,811
67	0	267,124	267,124	0	0	35,768	35,768
68	0	274,470	274,470	0	0	36,752	36,752
69	0	282,018	282,018	0	0	37,762	37,762
70	0	289,773	289,773	0	0	38,801	38,801
71	0	297,742	297,742	0	0	39,868	39,868
72	0	305,930	305,930	0	0	40,964	40,964
73	0	314,343	314,343	0	0	42,091	42,091
74	0	322,988	322,988	0	0	43,248	43,248
75	0	331,870	331,870	0	0	44,437	44,437
76	0	340,996	340,996	0	0	45,659	45,659
77	0	350,374	350,374	0	0	46,915	46,915
78	0	360,009	360,009	0	0	48,205	48,205
79	0	369,909	369,909	0	0	49,531	49,531
80	0	380,082	380,082	0	0	50,893	50,893
81	0	390,534	390,534	0	0	52,292	52,292
82	0	401,274	401,274	0	0	53,731	53,731
83	0	412,309	412,309	0	0	55,208	55,208
84	0	423,647	423,647	0	0	56,726	56,726
85	0	435,297	435,297	0	0	58,286	58,286
86	0	447,268	447,268	0	0	59,889	59,889
87	0	459,568	459,568	0	0	61,536	61,536
88	0	472,206	472,206	0	0	63,228	63,228
89	0	485,192	485,192	0	0	64,967	64,967
90	0	498,534	498,534	0	0	66,754	66,754
91	0	512,244	512,244	0	0	68,589	68,589
92	0	526,331	526,331	0	0	70,476	70,476
93	0	540,805	540,805	0	0	72,414	72,414
94	0	555,677	555,677	0	0	74,405	74,405
95	0	570,958	570,958	0	0	76,451	76,451
96	0	586,660	586,660	0	0	78,554	78,554
97	0	602,793	602,793	0	0	80,714	80,714
98	0	619,370	619,370	0	0	82,934	82,934
99	0	636,402	636,402	0	0	85,214	85,214
100	0	653,903	653,903	0	0	88,277	88,277

** Contributions related to future employees in excess of normal cost and expenses. Normal cost and expenses initially total 19.04% of pay but trend down over the projection period (based on the projection assumptions) due to the recognition of lower normal costs for Judges hired after June 30, 2013.*

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	$ 174,580	$ 13,748	$ 22,225	$ 67	$ 13,461	$ 179,497
2	179,497	13,520	23,341	64	13,797	183,409
3	183,409	13,186	24,668	60	14,042	185,909
4	185,909	12,963	25,794	57	14,187	187,208
5	187,208	12,768	26,924	55	14,239	187,236
6	187,236	12,605	27,830	52	14,200	186,159
7	186,159	12,425	28,776	49	14,071	183,830
8	183,830	12,228	29,796	46	13,840	180,056
9	180,056	12,030	30,858	43	13,493	174,678
10	174,678	11,834	31,919	40	13,020	167,573
11	167,573	11,686	32,805	37	12,418	158,835
12	158,835	11,585	33,591	35	11,694	148,488
13	148,488	11,486	34,383	32	10,842	136,401
14	136,401	11,365	35,127	29	9,854	122,464
15	122,464	11,225	35,929	26	8,716	106,450
16	106,450	11,118	36,606	23	7,421	88,360
17	88,360	11,072	37,105	20	5,971	68,278
18	68,278	11,052	37,417	18	4,372	46,267
19	46,267	11,058	37,575	16	2,627	22,361
20	22,361	11,099	37,553	14	741	0
21	0	11,153	37,431	12	0	0
22	0	11,225	37,198	9	0	0
23	0	11,354	36,703	8	0	0
24	0	11,521	36,015	6	0	0
25	0	11,716	35,176	5	0	0
26	0	11,925	34,243	4	0	0
27	0	12,177	33,128	3	0	0
28	0	12,477	31,848	2	0	0
29	0	12,792	30,527	2	0	0
30	0	13,131	29,143	1	0	0
31	0	13,490	27,729	1	0	0
32	0	13,878	26,257	0	0	0
33	0	14,242	24,744	0	0	0
34	0	14,619	23,249	0	0	0
35	0	15,013	21,761	0	0	0
36	0	15,426	20,285	0	0	0
37	0	15,850	18,848	0	0	0
38	0	16,286	17,452	0	0	0
39	0	16,734	16,098	0	0	0
40	0	17,194	14,790	0	0	0
41	0	17,667	13,529	0	0	0
42	0	18,153	12,319	0	0	0
43	0	18,652	11,162	0	0	0
44	0	19,165	10,060	0	0	0
45	0	19,692	9,016	0	0	0
46	0	20,234	8,032	0	0	0
47	0	20,790	7,109	0	0	0
48	0	21,362	6,250	0	0	0
49	0	21,949	5,454	0	0	0
50	0	22,553	4,719	0	0	0

Single Discount Rate Development
Projection of Plan Fiduciary Net Position (Continued)
(Dollars in Thousands)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	$ 0	$ 23,173	$ 4,049	$ 0	$ 0	$ 0
52	0	23,810	3,444	0	0	0
53	0	24,465	2,903	0	0	0
54	0	25,138	2,423	0	0	0
55	0	25,829	2,003	0	0	0
56	0	26,540	1,640	0	0	0
57	0	27,269	1,330	0	0	0
58	0	28,019	1,067	0	0	0
59	0	28,790	847	0	0	0
60	0	29,582	665	0	0	0
61	0	30,395	517	0	0	0
62	0	31,231	397	0	0	0
63	0	32,090	301	0	0	0
64	0	32,972	227	0	0	0
65	0	33,879	169	0	0	0
66	0	34,811	124	0	0	0
67	0	35,768	91	0	0	0
68	0	36,752	65	0	0	0
69	0	37,762	47	0	0	0
70	0	38,801	33	0	0	0
71	0	39,868	23	0	0	0
72	0	40,964	15	0	0	0
73	0	42,091	10	0	0	0
74	0	43,248	7	0	0	0
75	0	44,437	4	0	0	0
76	0	45,659	3	0	0	0
77	0	46,915	2	0	0	0
78	0	48,205	1	0	0	0
79	0	49,531	1	0	0	0
80	0	50,893	0	0	0	0
81	0	52,292	0	0	0	0
82	0	53,731	0	0	0	0
83	0	55,208	0	0	0	0
84	0	56,726	0	0	0	0
85	0	58,286	0	0	0	0
86	0	59,889	0	0	0	0
87	0	61,536	0	0	0	0
88	0	63,228	0	0	0	0
89	0	64,967	0	0	0	0
90	0	66,754	0	0	0	0
91	0	68,589	0	0	0	0
92	0	70,476	0	0	0	0
93	0	72,414	0	0	0	0
94	0	74,405	0	0	0	0
95	0	76,451	0	0	0	0
96	0	78,554	0	0	0	0
97	0	80,714	0	0	0	0
98	0	82,934	0	0	0	0
99	0	85,214	0	0	0	0
100	0	88,277	0	0	0	0

SINGLE DISCOUNT RATE DEVELOPMENT
PRESENT VALUES OF PROJECTED BENEFITS (DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
1	$ 174,580	$ 22,225	$ 22,225	$ 0	$ 21,396	$ 0	$ 21,663
2	179,497	23,341	23,341	0	20,825	0	21,617
3	183,409	24,668	24,668	0	20,397	0	21,706
4	185,909	25,794	25,794	0	19,768	0	21,566
5	187,208	26,924	26,924	0	19,122	0	21,388
6	187,236	27,830	27,830	0	18,319	0	21,005
7	186,159	28,776	28,776	0	17,555	0	20,636
8	183,830	29,796	29,796	0	16,846	0	20,302
9	180,056	30,858	30,858	0	16,169	0	19,977
10	174,678	31,919	31,919	0	15,501	0	19,633
11	167,573	32,805	32,805	0	14,765	0	19,172
12	158,835	33,591	33,591	0	14,011	0	18,652
13	148,488	34,383	34,383	0	13,291	0	18,140
14	136,401	35,127	35,127	0	12,585	0	17,608
15	122,464	35,929	35,929	0	11,930	0	17,112
16	106,450	36,606	36,606	0	11,265	0	16,565
17	88,360	37,105	37,105	0	10,582	0	15,954
18	68,278	37,417	37,417	0	9,890	0	15,285
19	46,267	37,575	37,575	0	9,204	0	14,584
20	22,361	37,553	22,361	15,192	5,076	7,342	13,849
21	0	37,431	0	37,431	0	17,425	13,115
22	0	37,198	0	37,198	0	16,683	12,384
23	0	36,703	0	36,703	0	15,859	11,610
24	0	36,015	0	36,015	0	14,992	10,824
25	0	35,176	0	35,176	0	14,106	10,045
26	0	34,243	0	34,243	0	13,229	9,291
27	0	33,128	0	33,128	0	12,330	8,540
28	0	31,848	0	31,848	0	11,420	7,801
29	0	30,527	0	30,527	0	10,545	7,104
30	0	29,143	0	29,143	0	9,699	6,444
31	0	27,729	0	27,729	0	8,890	5,825
32	0	26,257	0	26,257	0	8,110	5,241
33	0	24,744	0	24,744	0	7,363	4,693
34	0	23,249	0	23,249	0	6,665	4,189
35	0	21,761	0	21,761	0	6,010	3,726
36	0	20,285	0	20,285	0	5,397	3,300
37	0	18,848	0	18,848	0	4,831	2,913
38	0	17,452	0	17,452	0	4,310	2,563
39	0	16,098	0	16,098	0	3,830	2,246
40	0	14,790	0	14,790	0	3,390	1,961
41	0	13,529	0	13,529	0	2,987	1,704
42	0	12,319	0	12,319	0	2,621	1,474
43	0	11,162	0	11,162	0	2,288	1,269
44	0	10,060	0	10,060	0	1,986	1,087
45	0	9,016	0	9,016	0	1,715	925
46	0	8,032	0	8,032	0	1,472	783
47	0	7,109	0	7,109	0	1,255	659
48	0	6,250	0	6,250	0	1,063	550
49	0	5,454	0	5,454	0	894	456
50	0	4,719	0	4,719	0	745	375

SINGLE DISCOUNT RATE DEVELOPMENT
PRESENT VALUES OF PROJECTED BENEFITS (CONTINUED)
(DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
51	$ 0	$ 4,049	$ 0	$ 4,049	$ 21,396	$ 616	$ 306
52	0	3,444	0	3,444	20,825	505	247
53	0	2,903	0	2,903	20,397	410	198
54	0	2,423	0	2,423	19,768	329	157
55	0	2,003	0	2,003	19,122	262	123
56	0	1,640	0	1,640	18,319	207	96
57	0	1,330	0	1,330	17,555	162	74
58	0	1,067	0	1,067	16,846	125	56
59	0	847	0	847	16,169	96	42
60	0	665	0	665	15,501	72	32
61	0	517	0	517	14,765	54	23
62	0	397	0	397	14,011	40	17
63	0	301	0	301	13,291	29	12
64	0	227	0	227	12,585	21	9
65	0	169	0	169	11,930	15	6
66	0	124	0	124	11,265	11	4
67	0	91	0	91	10,582	8	3
68	0	65	0	65	9,890	5	2
69	0	47	0	47	9,204	4	1
70	0	33	0	33	5,076	2	1
71	0	23	0	23	0	2	1
72	0	15	0	15	0	1	0
73	0	10	0	10	0	1	0
74	0	7	0	7	0	0	0
75	0	4	0	4	0	0	0
76	0	3	0	3	0	0	0
77	0	2	0	2	0	0	0
78	0	1	0	1	0	0	0
79	0	1	0	1	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
				Totals	$ 298,496	$ 222,427	$ 520,923

SECTION H

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future benefit payments at predetermined rates of interest to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

GLOSSARY OF TERMS

Amortization Payment

The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method

The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

Cost-of-Living Adjustments

Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)

A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll

The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.

Deferred Inflows and Outflows of Resources

The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate or Single Discount Rate

For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method or Entry Age Normal (EAN)

The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GLOSSARY OF TERMS

Fiduciary Net Position	The fiduciary net position is the value of the net assets of the trust restricted for pension benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. 68 plan members are not considered non-employer contributing entities.
Normal Cost	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.
Other Postemployment Benefits (OPEB)	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

GLOSSARY OF TERMS

Total Pension Expense The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Changes in Benefit Terms
4. Employee Contributions
5. Projected Earnings on Plan Investments
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to the difference between expected and actual in measurement of the Total Pension Liability
9. Recognition of Outflow (Inflow) of Resources due to Assumption Changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments

Total Pension Liability (TPL) The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL) The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets The valuation assets are the plan fiduciary net position used in determining the net position liability of the plan. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.

Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

LEGISLATORS RETIREMENT FUND

GASB STATEMENTS NO. 67 AND NO. 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2015

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

November 30, 2015

Minnesota State Retirement System
Legislators Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the Legislators Retirement Fund ("LRF"). These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing financial reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. MSRS is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the Minnesota State Retirement System (MSRS) in its entirety and only with the permission of MSRS.

This report is based upon information, furnished to us by MSRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not otherwise audited.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Legislators Retirement Fund as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

By Brian B. Murphy
Brian B. Murphy
FSA, EA, FCA, MAAA

By Bonita J. Wurst
Bonita J. Wurst
ASA, EA, MAAA

OTHER OBSERVATIONS

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words of transferring the obligations to a unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

TABLE OF CONTENTS

SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

		2015
Actuarial Valuation Date		June 30, 2015
Measurement Date of the Net Pension Liability		June 30, 2015
Membership		
Number of		
- Service Retirements		305
- Survivors		72
- Disability Retirements		0
- Deferred Retirements		56
- Terminated other non-vested		0
- Active Members		23
- Total		456
Covered-employee Payroll [1]	$	1,700
Net Pension Liability		
Total Pension Liability	$	144,353
Plan Fiduciary Net Position		3,430
Net Pension Liability	$	140,923
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		2.38%
Net Pension Liability as a Percentage of Covered-employee Payroll		8,289.59%
Development of the Single Discount Rate		
Single Discount Rate		3.80%
Long-Term Expected Rate of Investment Return		7.90%
Long-Term Municipal Bond Rate [2]		3.80%
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded		2016
Total Pension Expense/(Income)	$	5,554

Deferred Outflows and Deferred Inflows by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of the Total Pension Liability	$ 0	$ 0
Changes in assumptions	0	0
Net difference between projected and actual earnings on pension plan investments	136	623
Totals	**$ 136**	**$ 623**

[1] Assumed equal to actual member contributions divided by employee contribution rate
[2] Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 25, 2015 (i.e., the weekly rate closest to but not later than the Measurement Date).

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

DISCUSSION

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans,* establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions,* establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state and local governmental employers to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to LRF subsequent to the measurement date of June 30, 2015.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the difference between expected and actual experience in the measurement of the Total Pension Liability, assumption changes and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a Statement of Fiduciary Net Position and a Statement of Changes in Fiduciary Net Position in accordance with GASB Statement No. 67. The *Statement of Fiduciary Net Position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *Statement of Changes in Fiduciary Net Position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes to the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

Both GASB Statements No. 67 and No. 68 require the notes to the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the Legislators Retirement Fund can be found online at www.msrs.state.mn.us/financial-information or obtained from MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 55103 or requested via email at info@msrs.us or telephone at 1-800-657-5757.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

GASB Statements Nos. 67 and 68 require that an actuarial valuation to determine the total pension liability be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2015 and a measurement date of June 30, 2015.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected long-term rate of return on pension plan investments is 7.90%; the municipal bond rate is 3.80% (based on the weekly rate closest to but not later than the measurement date of the 20-Year Bond Buyer Index as published by the Federal Reserve Board); and the resulting single discount rate is 3.80%.

Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB. MSRS first implemented GASB Statement No. 67 for fiscal year 2014.

SECTION B

FINANCIAL STATEMENTS

PENSION EXPENSE UNDER GASB STATEMENT NO. 68
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Expense			
1.	Service Cost	$	428
2.	Interest on the Total Pension Liability		6,113
3.	Current-Period Benefit Changes		0
4.	Employee Contributions (made negative for addition here)		(153)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(451)
6.	Pension Plan Administrative Expense		37
7.	Other Changes in Plan Fiduciary Net Position		0
8.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Current Reporting Period		(7,303)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		7,057
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Current Reporting Period		34
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**5,762**
12.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Prior Reporting Periods		0
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		0
14.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Prior Reporting Periods		(208)
15.	**Total Pension Expense / (Income)**	**$**	**5,554**

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Outflows (Inflows) of Resources due to Liabilities		
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$	(7,303) [1]
2. Assumption Changes (gains) or losses		7,057 [2]
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		1.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	$	(7,303)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes		7,057
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(246)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$	0
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes		0
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	0
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	170
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	34
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	136

[1] *Includes impact of changes in expected timing of future post-retirement benefit increases.*

[2] *Assumption changes are summarized on page 30.*

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended June 30, 2015 (Dollars in Thousands)

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Due to Liabilities	$ 7,057	$ 7,303	$ (246)
2. Due to Assets	34	208	(174)
3. Total	$ 7,091	$ 7,511	$ (420)

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Differences between expected and actual experience	$ 0	$ 7,303	$ (7,303)
2. Assumption Changes	7,057	0	7,057
3. Net Difference between projected and actual earnings on pension plan investments	34	208	(174)
4. Total	$ 7,091	$ 7,511	$ (420)

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/(Inflows) of Resources
1. Differences between expected and actual experience	$ 0	$ 0	$ 0
2. Assumption Changes	0	0	0
3. Net Difference between projected and actual earnings on pension plan investments	136	623	(487)
4. Total	$ 136	$ 623	$ (487)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows/(Inflows) of Resources
2016	$ (174)
2017	(174)
2018	(173)
2019	34
2020	0
Thereafter	0
Total	$ (487)

STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

Assets		**June 30, 2015**
Cash & Short-term Investments	$	798
Receivables		17
Investment Pools (at fair value)		3,403
Securities Lending Collateral		354
Capital Assets		0
Total Assets	**$**	**4,572**
Total Deferred Outflows of Resources	**$**	**0**
Total Liabilities	**$**	**(1,142)**
Total Deferred Inflows of Resources	**$**	**0**
Net Position Restricted for Pensions	**$**	**3,430**

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR THE FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

1.	**Net position at market value at beginning of year**	**$**	**8,258**
Additions			
2.	Contributions		
	a. Employee	$	153
	b. Employer		0
	c. State General Fund Appropriations		3,216
	d. Total contributions	$	3,369
3.	Investment income		
	a. Investment income/(loss)	$	288
	b. Investment expenses		(7)
	c. Net investment income/(loss)	$	281
4.	Other Additions	$	0
5.	**Total Additions** *(2.d.) + (3.c.) + (4.)*	**$**	**3,650**
Deductions			
6.	Benefits Paid		
	a. Annuity benefits	$	(8,441)
	b. Refunds		0
	c. Total benefits paid	$	(8,441)
7.	Expenses		
	a. Other deductions	$	0
	b. Administrative		(37)
	c. Total expenses	$	(37)
8.	**Total deductions** *(6.c.) + (7.c.)*	**$**	**(8,478)**
9.	**Net increase/(decrease) in fiduciary net position** *(5.) + (8.)*	**$**	**(4,828)**
10.	**Net position at market value at end of year** *(1.) + (9.)*	**$**	**3,430**
11.	State Board of Investment calculated annual investment return		4.4%

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD

FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Total pension liability			
1. Service Cost	$	428	
2. Interest on the Total Pension Liability		6,113	
3. Changes of benefit terms		0	
4. Difference between expected and actual experience of the Total Pension Liability		(7,303)	(1)
5. Changes of assumptions		7,057	(2)
6. Benefit payments, including refunds of employee contributions		(8,441)	
7. Net change in total pension liability	$	(2,146)	
8. Total pension liability – beginning		146,499	
9. Total pension liability – ending	**$**	**144,353**	
B. Plan fiduciary net position			
1. Contributions – State General Fund Appropriations	$	3,216	
2. Contributions – employee		153	
3. Net investment income		281	
4. Benefit payments, including refunds of employee contributions		(8,441)	
5. Pension Plan Administrative Expense		(37)	
6. Other changes		0	
7. Net change in plan fiduciary net position	$	(4,828)	
8. Plan fiduciary net position – beginning		8,258	
9. Plan fiduciary net position – ending	**$**	**3,430**	
C. Net pension liability, *A.9.-B.9.*	**$**	**140,923**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9./A.9.*		**2.38%**	
E. Covered-employee payroll	**$**	**1,700**	**(3)**
F. Net pension liability as a percentage of covered-employee payroll, *C./E.*		**8,289.59%**	

(1) *Includes impact of changes in expected timing of future post-retirement benefit increases.*

(2) *Assumption changes are summarized on page 30.*

(3) *Assumed equal to actual member contributions divided by employee contribution rate.*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS MULTIYEAR (DOLLARS IN THOUSANDS)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal year ending June 30,	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Pension Liability										
Service Cost	$ 428	$ 398								
Interest on the Total Pension Liability	6,113	6,177								
Benefit Changes	0	0								
Difference between Expected and Actual Experience	(7,303)	(237)								
Assumption Changes	7,057 [1]	11,201								
Benefit Payments	(8,441)	(8,407)								
Refunds	0	(79)								
Net Change in Total Pension Liability	$ (2,146)	$ 9,053								
Total Pension Liability - Beginning	146,499	137,446								
Total Pension Liability - Ending (a)	**$ 144,353**	**$ 146,499**								
Plan Fiduciary Net Position										
State General Fund Appropriation	$ 3,216	$ 3,436								
Employee Contributions	153	101								
Pension Plan Net Investment Income	281	1,750								
Benefit Payments	(8,441)	(8,407)								
Refunds	0	(79)								
Pension Plan Administrative Expense	(37)	(36)								
Other Changes	0	0								
Net Change in Plan Fiduciary Net Position	$ (4,828)	(3,235)								
Plan Fiduciary Net Position - Beginning	8,258	11,493								
Plan Fiduciary Net Position - Ending (b)	**$ 3,430**	**$ 8,258**								
Net Pension Liability - Ending (a) - (b)	**$ 140,923**	**138,241**								
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**2.38 %**	**5.64 %**								
Covered-Employee Payroll [2]	**$ 1,700**	**$ 1,122**								
Net Pension Liability as a Percentage of Covered-Employee Payroll	**8,289.59 %**	**12,320.94 %**								

Notes to Schedule:

(1) *Assumption changes are summarized on page 30.*

(2) *Assumed equal to plan member contributions divided by employee contribution rate.*

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

Schedules of Required Supplementary Information
Schedule of Net Pension Liability Multiyear (Dollars in Thousands)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal Year Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered-Employee Payroll	Net Pension Liability as a % of Covered-Employee Payroll
	(a)	(b)	(a)-(b)=(c)	(b)/(c)	(d)	(c)/(d)
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 146,499	$ 8,258	$ 138,241	5.64%	$ 1,122	12,320.94 %
2015	144,353	3,430	140,923	2.38%	1,700	8,289.59 %

The covered-employee payroll figure shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered-Employee Payroll as defined in GASB Statement Nos. 67 and 68. If a different payroll figure should be used in this schedule, please let us know.

SCHEDULE OF CONTRIBUTIONS MULTIYEAR* (DOLLARS IN THOUSANDS)
Last 10 Fiscal Years

Fiscal Year Ending June 30,	Actuarially Determined Contribution	Actual Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll	Actual Contribution as a % of Covered-Employee Payroll
	(a)	(b)	(a)-(b)=(c)	(d)	(b)/(d)
2006	$ 3,460	$ 6,101	$ (2,641)	$ 2,894	210.82%
2007	2,885	2,199	686	2,380	92.39
2008	3,736	2,652	1,084	1,993	133.07
2009	5,084	1,711	3,373	1,963	87.16
2010	8,183	2,428	5,755	1,877	129.36
2011	8,164	3,265	4,899	1,774	184.05
2012	19,348	4,401	14,947	1,378	319.38
2013	17,402	3,869	13,533	1,233	313.79
2014	22,157	3,436	18,721	1,122	306.24
2015	38,736	3,216	35,520	1,700	189.18

* *Effective July 1, 2013, the Elective State Officers Retirement Fund was administratively consolidated with the Legislators Retirement Fund. All figures in the table above represent the combined total from both funds, as directed by MSRS.*

NOTES TO SCHEDULE OF CONTRIBUTIONS

Valuation Date:	June 30, 2015
Notes	Actuarially determined contribution rates are calculated as of each July 1 and apply to the fiscal year beginning on the measurement date.

Methods and Assumptions Used to Determine Contribution Rates Reported in this Schedule:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Dollar, Closed
Remaining Amortization Period	11 years
Asset Valuation Method	Market value of assets
Salary Increases	5.00% including inflation
Investment Rate of Return	0.00% per annum
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study prepared by a former actuary.
Healthy Post-Retirement Mortality	RP-2000 annuitant generational mortality table, projected with mortalilty improvement scale AA, white collar adjustment.

Other Information:

Benefit Increases After Retirement	The post-retirement increase is assumed to increase from 2.0% to 2.5% beginning January 1, 2036.
	See separate funding actuarial valuation report as of July 1, 2015 for additional detail. To obtain this report, contact MSRS as noted on page 3. The report is also available online at www.msrs.state.mn.us/actuarial-reports.

SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	19.30 %
2015	5.00 %

[1] *Annual money-weighted rate of return, net of investment expenses.*

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

Rate of Return

For the year ended June 30, 2015, the annual money-weighted rate of return for the State Patrol Retirement Fund was 5.00%. The money-weighted rate of return is a method of calculating period-by-period returns on pension plan investments that adjusts for the changing amounts actually invested. For purposes of this schedule, the money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

10-Year Schedule of Money-Weighted Investment Return

Ten-year data is not available. Additional years will be provided when they become available.

To request additional information about the computation of the annual money-weighted rate of return and the investments for the Minnesota Retirement Systems (including the investments for MSRS' defined benefit retirement funds), contact SBI at 60 Empire Drive, Suite 355, St. Paul, Minnesota, 55103, via email at minn.sbi@state.mn.us or telephone at (651) 296-3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

ASSET ALLOCATION

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Best estimates for expected future real rates of return (expected returns, net of inflation) were developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce geometric, long-term expected real rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each asset class that is included in the pension fund's target asset allocation as of June 30, 2015, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	45.00%	5.50%
International Stocks	15.00	6.00
Bonds	18.00	1.45
Alternative Assets	20.00	6.40
Unallocated Cash	2.00	0.50
Total	100.00%	

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

At MSRS' direction, for purposes of this valuation, the long-term expected rate of return assumption is 7.90%. This assumption is based on a review of inflation and investment return assumptions dated September 11, 2014. Since the plan's assets are expected to be depleted during the first year, MSRS' long-term expected rate of investment return of 7.90% is not utilized in this valuation. A single discount rate of 3.80% was used to measure the total pension liability as of July 1, 2015.

SENSITIVITY OF NET PENSION LIABILITY TO THE SINGLE DISCOUNT RATE ASSUMPTION

Single Discount Rate

A single discount rate of 3.80% was used to measure the total pension liability. This single discount rate was based on a municipal bond rate of 3.80% and the pay-as-you-go status of this plan. Since the plan's assets are expected to be depleted during the first year, MSRS' long-term expected rate of investment return of 7.90% is not utilized in this valuation.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the fund's net pension liability, calculated using a single discount rate of 3.80%, as well as what the fund's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower (2.80%) or 1-percentage-point higher (4.80%) than the current rate:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 2.80%	Current Single Discount Rate Assumption 3.80%	1% Increase 4.80%
Total Pension Liability	$160,837	$144,353	$130,560
Net Position Restricted for Pensions	$ 3,430	$ 3,430	$ 3,430
Net Pension Liability	$157,407	$140,923	$127,130

For more information on the calculation of the single discount rate, refer to Section G of this report.

GASB STATEMENT NO. 68 RECONCILIATION (DOLLARS IN THOUSANDS)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Total Pension Expense
Balance Beginning of Year	**$ 146,499**	**$ 8,258**	**$ 138,241**	**$ -**	**$ 831**	
Changes for the Year:						
Service Cost	$ 428		$ 428			$ 428
Interest on Total Pension Liability	6,113		6,113			6,113
Interest on Plan Fiduciary Net Position (1)		$ 451	(451)			(451)
Changes in Benefit Terms						
Liability Experience Gains and Losses	(7,303)		(7,303)			(7,303)
Changes in Assumptions	7,057		7,057			7,057
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)						-
Assumption Changes						-
Investment Gains/(Losses)					(208)	(208)
State General Fund Appropriations		3,216	(3,216)			
Contributions - Employees		153	(153)			(153)
Asset Gain/(Loss) (1)		(170)	170	$ 136		34
Benefit Payouts	(8,441)	(8,441)				
Administrative Expenses		(37)	37			37
Other Changes						
Net Changes	**$ (2,146)**	**$ (4,828)**	**$ 2,682**	**$ 136**	**$ (208)**	**$ 5,554**
Balance End of Year	**$ 144,353**	**$ 3,430**	**$ 140,923**	**$ 136**	**$ 623**	

(1) The sum of these items equals the net investment income of $281.

SUMMARY OF POPULATION STATISTICS

	Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2014	**24**	**63**	**0**	**301**	**0**	**74**	**462**
Additions	0	0	0	0	0	0	**0**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	0	0	0	0	0	0	**0**
Service retirements	(1)	(8)	0	9	0	0	**0**
Terminated deferred	0	0	0	0	0	0	**0**
Terminated refund/transfer	0	0	0	0	0	0	**0**
Deaths	0	0	0	(8)	0	(6)	**(14)**
New beneficiary	0	0	0	0	0	4	**4**
Disabled	0	0	0	0	0	0	**0**
Unexpected status changes	0	1	0	3	0	0	**4**
Net change	(1)	(7)	0	4	0	(2)	**(6)**
Members on 6/30/2015	**23**	**56**	**0**	**305**	**0**	**72**	**456**

SECTION E

SUMMARY OF BENEFITS

SUMMARY OF PLAN PROVISIONS – LEGISLATORS RETIREMENT PLAN

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	Members of the State Legislature first elected to office before July 1, 1997 and who elect to retain coverage under this plan (i.e., do not elect Social Security coverage).
Contributions	
Member	9.00% of salary which must be paid to the state's General Fund.
Employer	Plan is funded by annual appropriations from the state's General Fund. Employee contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
Allowable service	Service while in an eligible position.
Salary	Compensation received for service as a member of the legislature. Salary includes the monthly compensation paid to a legislator and the per diem payments paid during a regular or special session. Salary does not include additional compensation attributable to a leadership position.
Average salary	Average of the five highest successive years of salary.

Retirement

<u>Normal retirement benefit</u>

Age/Service requirements	Age 62 and either six full years of service or service during all or part of four regular legislative sessions. For eligibility purposes, service does not include credit for time not served when a member does not serve a full term of office.
Amount	A percentage of Average Salary for each year of service as follows: First elected prior to January 1, 1979: (a) 5.00% for the first eight years of service prior to January 1, 1979; and (b) 2.50% for subsequent years. Elected after December 31, 1978: (a) 2.50%.

SUMMARY OF PLAN PROVISIONS – LEGISLATORS RETIREMENT PLAN (CONTINUED)

Retirement (Continued)

Early retirement benefit

Age/service requirements	Age 55 and either six full years of Service or Service during all or part of four regular legislative sessions.
Amount	Normal retirement benefit based on service and Average Salary at retirement date and actuarially reduced for each month the member is under age 62 assuming augmentation to age 62 at 3.00% per year.
Form of payment	Paid as a 50% joint and survivor annuity to member, spouse and dependent children. Annuitants may elect 100% joint and survivor bounce back annuity, life annuity, or a term certain and life annuity on an actuarially equivalent basis.
Benefit increases	Since 2011, benefit recipients have received annual 2.0% benefit increases. When the funding ratio of the State Employees Retirement Fund reaches 90% for two consecutive years (actuarial accrued liability on a Market Value of Assets basis) for two consecutive years, the benefit increase will revert to 2.5%. If, after reverting to a 2.5% increase, the State Employees Retirement Fund funding ratio (determined on a Market Value of Assets basis) declines to less than 80% for the most recent actuarial valuation year or 85% for two consecutive years, the benefit increase will decrease to 2.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a pro rata increase.
Disability	No additional benefits provided beyond standard plan. Treated as retirement or termination, depending on age and service at termination.

Death

Surviving spouse benefit

Age/Service requirement	Death while active, or after termination if service requirements for a normal retirement benefit is met but payments have not begun.
Amount	Survivor payments of 50% of the retirement benefit of the member assuming the member had attained normal retirement age and had a minimum of eight years of service. Benefit is paid for life. A former member's benefit is augmented as a Deferred Annuity to date of death before determining the portion payable to the spouse. If the legislator was at least age 60 at death, the surviving spouse may elect an optional joint and survivor annuity. If a deferred benefit was not eligible to be in pay status before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.

SUMMARY OF PLAN PROVISIONS – LEGISLATORS RETIREMENT PLAN (CONTINUED)

Death (Continued)

Surviving dependent children's benefit

Age/Service requirement	Same as spouse's benefit.
Amount	Benefit for first child is 25.00% of the retirement benefit (computed as for surviving spouse) with 12.50% for each additional child. Maximum payable (including spouse) is 100.00% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full-time student).
Benefit increases	Same as retirement.

Refund of contributions

Age/Service requirement	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	Member's contributions with 6.00% annual interest compounded daily until June 30, 2011, 4.00% thereafter.

Termination

Refund of contributions

Age/Service requirement	Termination of service.
Amount	Member's contributions with 6.00% annual interest compounded daily until June 30, 2011, 4.00% thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund.

Deferred benefit

Age/service requirement	Same service requirements as for normal retirement.
Amount	Benefit computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1973; (b.) 5.00% from July 1, 1973 to January 1, 1981; (c.) 3.00% until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (d.) 5.00% until the earlier of January 1, 2012 and when the annuity begins; and (e.) 2.00% from January 1, 2012 forward. Amount is payable at normal or early retirement. For members who terminated prior to July 1, 1997 but were not eligible to commence their pensions before July 1, 1997, the benefit shall be increased to reflect the actuarial equivalent change in post-retirement interest rate from 5.00% to 6.00%.

Adjustments for benefits not in pay status	Benefits are adjusted on an actuarial equivalent basis to reflect the 1997 change in post-retirement interest rate assumption from 5.0% to 6.0%.

SUMMARY OF PLAN PROVISIONS – LEGISLATORS RETIREMENT PLAN (CONCLUDED)

Optional form conversion factors	Actuarially equivalent factors based on RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2025 using Scale AA, blended 55% 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; and (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	Effective July 1, 2015, a provision was added so that if the 2.5% post-retirement benefit increase is triggered and the State Employees Retirement Fund funding ratio determined on a Market Value of Assets basis declines to less than 80% for the most recent year or 85% for two consecutive years, the benefit increase will decrease to 2.0% until the plan reaches a 90% funding ratio for two consecutive years.

SUMMARY OF PLAN PROVISIONS – ELECTIVE STATE OFFICERS RETIREMENT PLAN

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	Must be employed as a "Constitutional Officer" first elected prior to July 1, 1997 and must elect to retain coverage under this plan (i.e., does not elect Social Security coverage). Plan is closed to new members since July 1, 1997.
Contributions	Plan is funded by annual appropriations from the State's General Fund.
Allowable service	Service while in an eligible position as a constitution officer.
Salary	Salary upon which Elective State Officers Retirement Fund contributions have been made.
Average salary	Average of the five highest successive years of Salary.
Retirement	
Normal retirement benefit	
Age/Service requirements	Age 62 and eight years of Allowable Service.
Amount	2.50% of Average Salary for each year of Allowable Service. For members who terminated service after June 30, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Early retirement benefit	
Age/Service requirement	Age 60 and eight years of Allowable Service.
Amount	Normal retirement benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.50% for each month the member is under age 62 at the time of retirement.
Form of Payment	Life annuity.
Benefit increases	Since 2011, benefit recipients have received annual 2.0% benefit increases. When the funding ratio of the State Employees Retirement Fund reaches 90% (actuarial accrued liability ratio on a Market Value of Assets basis) for two consecutive years, the benefit increase will revert to 2.5%. If, after reverting to a 2.5% increase, the State Employees Retirement Fund funding ratio (determined on a Market Value of Assets basis) declines to less than 80% for the most recent actuarial valuation year or 85% for two consecutive years, the benefit increase will decrease to 2.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a pro rata increase.
Disability	No additional benefits provided beyond standard plan. Treated as retirement or termination, depending on age and Allowable Service as of disablement.

SUMMARY OF PLAN PROVISIONS – ELECTIVE STATE OFFICERS RETIREMENT PLAN (CONTINUED)

Death	
Surviving spouse benefit	
Age/Service requirement	Death while active, or after retirement, or after termination but prior to retirement with at least eight years of Allowable Service.
Amount	Survivor payments of 50% of the retirement benefit of the member assuming the member had attained age 62 and had a minimum of eight years of Allowable Service. A former member's benefit is augmented as a Deferred Annuity to date of death before determining the portion payable to the spouse. If a member dies prior to July 1, 1997 and the beneficiary was not eligible to commence a survivor benefit as of July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.
Surviving dependent children's benefit	
Age/Service requirement	Same as spouse's benefit.
Amount	Benefit for first child is 25.00% of the retirement benefit (computed as for surviving spouse) with 12.50% for each additional eligible child. Maximum payable (including spouse) is 100.00% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full-time student).
Benefit increases	Same as for retirement.
Termination	
Refund of contributions	
Age/Service requirement	Termination of service.
Amount	Member's contributions with 6.00% interest compounded daily to July 1, 2011 and 4.00% compounded daily thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund.
Deferred benefit	
Age/service requirement	Eight years of Allowable Service.

SUMMARY OF PLAN PROVISIONS – ELECTIVE STATE OFFICERS RETIREMENT PLAN (CONCLUDED)

Termination (Continued) Deferred benefit Amount	Benefit computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1979; (b.) 5.00% from July 1, 1979 to January 1, 1981; (c.) 3.00% until age 55, or until January 1, 2012, whichever is earlier; (d.) 5.00% thereafter until the annuity begins but prior to January 1, 2012; and (e.) 2.00% from January 1, 2012 thereafter. Amount is payable at normal or early retirement. If a member terminated prior to July 1, 1997 but was not eligible to commence his or her pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
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; and (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.
Optional Form Conversion Factors	Actuarially equivalent factors based on RP-2000 mortality for healthy annuitants, white collar adjustment, projected to 2025 using scale AA, blended 55% males, and 6.5% interest.
Changes in Plan Provisions	Effective July 1, 2015, a provision was added so that if the 2.5% post-retirement benefit increase is triggered and the State Employees Retirement Fund funding ratio determined on a Market Value of Assets basis declines to less than 80% for the most recent year or 85% for two consecutive years, the benefit increase will decrease to 2.0% until the plan reaches a 90% funding ratio for two consecutive years.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

ACTUARIAL METHODS

Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an **Individual Entry-Age Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement;

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Total Pension Liability.

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 2.0% post-retirement benefit increase. If the funding ratio (on a market value of assets basis) of the State Employees Retirement Fund (SERF) reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase in the Legislators Retirement Fund will revert to 2.5%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of the SERF liabilities and assets. For additional detail, see the 2015 GASB Statements No. 67 and 68 valuation report for the SERF which can be found online at www.msrs.state.mn.us/actuarial-reports. The projection indicates that this plan is expected to begin paying 2.5% benefit increases on January 1, 2044. This assumption is reflected in our calculations.

Decrement Timing

All decrements are assumed to occur mid-year.

Asset Valuation Method

Fair value of assets.

SUMMARY OF ACTUARIAL ASSUMPTIONS

The following assumptions were used in valuing the liabilities and benefits under the plan. The demographic assumptions are based on the last experience study, dated February 2012, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014.

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	7.90% per annum.
Single discount rate	3.80% per annum.
Benefit increases after retirement	2.00% per annum through 2043 and 2.50% thereafter.
Salary increases	5.00% annually.
Inflation	2.75% annually.
Mortality rates	
Healthy Pre-retirement	RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment, set forward three years for males and set back one year for females.
Healthy Post-retirement	RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment. 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	N/A
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	Ultimate rates based on actual experience. Rates are shown in rate table.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Disability	None.
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 a 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 62.
Percentage married	85% of active members are assumed to be married. 100% of Elective State Officers members are assumed to be eligible for the automatic 50% survivor benefit.
Age of spouse	Females are assumed to be three years younger than their male spouses.
Eligible children	Each member may have two dependent children depending on member's age. Assumed first born child born at member's age 28 and second born child at member's age 31.
Form of payment	Active married members are assumed to elect 50% joint and survivor annuity. Active single members and deferred members are assumed to elect a life annuity. Unless reported with a joint & survivor option, retired members are assumed to have a spouse that is eligible for the automatic survivor benefit. Deferred Elective State Officers Retirement Fund members are assumed to elect a life annuity with automatic survivor benefits.
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.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by MSRS. 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. In cases where submitted data was missing or incomplete, the following assumptions were applied: **Legislators Retirement Fund** <u>Data for active members:</u> There were no members reported with zero or invalid salary. There were no members reported with missing service. There were no members reported with missing or invalid gender or birth dates. <u>Data for terminated members:</u> There were 11 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 (10 members), we assumed a value of $30,000. There were no members reported without credited service or a termination date. There were no members reported with missing or invalid gender or birth dates. <u>Data for members receiving benefits:</u> There were no members reported with missing or invalid birth dates. There was one survivor reported with an invalid gender. We assumed female gender for the valuation. There were 295 retired members reported: ▪ 114 members were reported with the 75% or 100% joint and survivor option. These members were valued as indicated by the option elected. ▪ 181 members were reported with a life annuity or the 50% joint and survivor option. All of these members were valued as a 50% joint & survivor annuity per MSRS' direction. Of the 295 retired members, 164 members had an invalid or missing survivor gender and 156 members had a missing or invalid survivor date of birth. We used the valuation assumptions if the survivor gender or date of birth was missing or invalid. There was 1 retiree reported with a bounce back annuity but was not reported with a reasonable reduction factor. A factor of 0.80 was assumed for the 100% joint and survivor annuity. There were no survivors reported on the data file with an expired benefit.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	**Elective State Officers Retirement Fund** There were no members reported with missing gender, birth dates or benefit amounts. <u>Data for members receiving benefits:</u> Unless reported with the 100% joint & survivor option, all retired and deferred members were assumed to have a spouse that is eligible for the automatic survivor benefit. Valuation assumptions were used if the survivor gender (6 members) or date of birth (6 members) were missing or invalid.
Changes in actuarial assumptions	The single discount rate changed from 4.29% to 3.80%. The assumed post-retirement benefit increase rate was changed from 2.0% per year through 2015 and 2.5% thereafter to 2.0% per year through 2043 and 2.5% thereafter. For accounting purposes, this change was treated as a difference between expected and actual experience.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

	Rate (%)*			
	Healthy Pre-Retirement Mortality**		Healthy Post-Retirement Mortality**	
Age	Male	Female	Male	Female
20	0.04%	0.02%	0.03%	0.02%
25	0.04	0.02	0.04	0.02
30	0.05	0.02	0.04	0.03
35	0.08	0.04	0.06	0.05
40	0.11	0.06	0.09	0.06
45	0.17	0.09	0.13	0.10
50	0.24	0.15	0.60	0.24
55	0.35	0.22	0.54	0.35
60	0.56	0.34	0.66	0.56
65	0.85	0.54	1.16	0.91
70	2.67	0.82	1.93	1.52

* *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 prescribed, but note that the prescribed assumption may not be reasonable at every age. If the rates were reasonably adjusted so that they decrease 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.*

Age	Percent Retiring
60	0.00%
61	0.00
62	40.00
63	30.00
64	30.00
65	40.00
66	30.00
67	25.00
68	25.00
69	25.00
70	30.00
71+	100.00

	Withdrawal	
Service	House	Senate
1	0.0%	0.0%
2	30.0	0.0
3	0.0	0.0
4	20.0	25.0
5	0.0	0.0
6	10.0	0.0
7	0.0	0.0
8	5.0	10.0
9+	0.0	0.0

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Fiduciary Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term expected rate of return is used as the discount rate. In years where assets are not projected to be sufficient to meet benefit payments, the use of a "risk-free" municipal bond rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the plan fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board (FRB)) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

This plan is currently funded on a pay-as-you-go basis by annual appropriations from the state's General Fund. The current contribution levels (member contributions and annual appropriations) are not sufficient to cover annual benefit payments. For the fiscal year ending June 30, 2015, total contributions (plan member contributions and state General Fund appropriations) were $3.4 million and total benefit payments were $8.4 million.

For the purpose of this valuation, we have recognized that the assets are not sufficient to pay benefits in any future year regardless of future investment income. The municipal bond rate is 3.80% (based on the FRB rate as of June 25, 2015); and the **resulting single discount rate is 3.80%.**

SECTION H

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future benefit payments at predetermined rates of interest to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

GLOSSARY OF TERMS

Amortization Payment The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

Cost-of-Living Adjustments Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan) A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll The payroll of covered employees, which is typically only the pensionable pay meets the statutory salary definition) and does not include pay above any pay cap.

Deferred Inflows and Outflows of Resources The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate or Single Discount Rate For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method or Entry Age Normal (EAN) The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GLOSSARY OF TERMS

Fiduciary Net Position	The fiduciary net position is the value of the net assets of the trust restricted for pension benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. plan members are not considered non-employer contributing entities.
Normal Cost	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.
Other Postemployment Benefits (OPEB)	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

GLOSSARY OF TERMS

Total Pension Expense

The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Changes in Benefit Terms
4. Employee Contributions
5. Projected Earnings on Plan Investments
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to the difference between expected and actual in measurement of the Total Pension Liability
9. Recognition of Outflow (Inflow) of Resources due to Assumption Changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments

Total Pension Liability (TPL)

The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL)

The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets

The valuation assets are the plan fiduciary net position used in determining the net position liability of the fund. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.