Minnesota State Retirement System
Correctional Employees Retirement Fund

GASB Statement Nos. 67 and 68

Accounting and Financial Reporting for Pensions

June 30, 2023

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November 27, 2023

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, as amended by GASB Statement No. 82. These calculations have been made on a basis that is consistent with our understanding of these accounting statements.

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. GASB Statement No. 82 is an amendment to GASB Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. The calculation of the plan's liability for this report may not be applicable for purposes of funding the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statements No. 67 and No. 68 may produce significantly different results. The information in this report is calculated on a total plan basis. The Minnesota State Retirement System (MSRS) is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer. This report may be provided to parties other than MSRS only in its entirety and only with the permission of MSRS. GRS is not responsible for unauthorized use of this report.

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 audited.

This report complements the actuarial valuation report for funding purposes that was or will be provided to the System and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2023 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

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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.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

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

Bonita J. Wurst and Sheryl Christensen 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,
Gabriel, Roeder, Smith & Company

Bonita J. Wurst

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

Sheryl Christensen

Sheryl Christensen, FSA, EA, FCA, MAAA

BJW/SLC:sc

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SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2023 (Dollars in Thousands)

	2023
Actuarial Valuation Date	June 30, 2023
Measurement Date of the Net Pension Liability	June 30, 2023
Membership	
Number of	
- Service Retirements	3,448
- Survivors	306
- Disability Retirements	335
- Deferred Retirements	1,544
- Terminated Other Non-vested	1,309
- Active Members	4,426
- Total	11,368
Covered-Employee Payroll [1]	$ 310,865
Net Pension Liability	
Total Pension Liability	$ 2,134,092
Plan Fiduciary Net Position	1,595,630
Net Pension Liability	$ 538,462
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	74.77%
Net Pension Liability as a Percentage of Covered-Employee Payroll	173.21%
Development of the Single Discount Rate	
Single Discount Rate	7.00%
Long-Term Expected Rate of Investment Return	7.00%
Long-Term Municipal Bond Rate [2]	3.86%
Last year ending June 30 in the 2024 to 2123 projection period for which projected benefit payments are fully funded	2123
Total Pension Expense/ (Income)	$ 89,209

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	$ 40,153	$ 1,894
Changes in assumptions	107,825	90,701
Net difference between projected and actual earnings on pension plan investments	128,759	135,028
Total	$ 276,737	$ 227,623

[1] *Assumed equal to actual member contributions divided by employee contribution rate.*

[2] *Based on the 20-Year Municipal GO Index of mixed maturity general obligation municipal bonds as of the weekly rate closest to but not later than the Measurement Date.*

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. GASB Statement No. 82, Pension Issues, is an amendment to GASB Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

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 the Correctional Employees Retirement Fund subsequent to the measurement date of June 30, 2023.

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/annual-reports-fy-2023 or obtained from MSRS at 60 Empire Drive, Suite 300, St. Paul, Minnesota, 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.

Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be 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).

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if there are no changes in benefits, Chapter 356 required contributions are made, and all actuarial assumptions are met (including the assumption of the plan earning 7.00% on an actuarial value of assets basis, as prescribed by statutes), then the following outcomes are expected:

1. The employer normal cost is expected to remain approximately level as a percent of pay;
2. The funded status of the plan is expected to gradually improve and is expected to be 100% funded within the next 25 years; and
3. The unfunded liability will grow initially as a dollar amount before beginning to decline.

The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

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 market 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 an 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 actuarial value of assets were used instead of the market value of assets.

Limitation of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. For employer reporting, the net pension liability and pension expense should be measured as of a date (measurement date) no earlier than the end of the employer's prior fiscal year, consistently applied from period to period. 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, 2023 and a measurement date of June 30, 2023.

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 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 7.00%; the municipal bond rate is 3.86% (based on the weekly rate closest to but not later than the measurement date of the "20-Year Municipal GO AA Index" as published by Fidelity); and the resulting single discount rate is 7.00%.

SECTION B

FINANCIAL STATEMENTS

Statement of Pension Expense Under GASB Statement No. 68
Fiscal Year Ended June 30, 2023 (Dollars in Thousands)

A. Expense		
1. Service Cost	$	55,557
2. Interest on the Total Pension Liability		138,597
3. Current-Period Benefit Changes		950
4. Employee Contributions		(29,843)
5. Projected Earnings on Plan Investments		(99,192)
6. Pension Plan Administrative Expense		970
7. Other Changes in Plan Fiduciary Net Position		(9)
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		8,602
9. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Current Reporting Period		(18,206)
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.50%) and actual earnings on Pension Plan Investments		
Arising from Current Reporting Period		(6,264)
11. **Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**51,162**
12. Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
Arising from Prior Reporting Periods		8,617
13. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Prior Reporting Periods		35,872
14. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on Pension Plan Investments		
Arising from Prior Reporting Periods		(6,442)
15. **Total Pension Expense / (Income)**	**$**	**89,209**

Recognition of Deferred Outflows and Inflows of Resources

Differences between expected and actual experience and changes in assumptions are recognized in pension expense using a systematic and rational method over a closed period equal to the average of the expected remaining service lives of all employees that are provided with pension through the pension plan (active employees and inactive employees) determined as of the beginning of the measurement period.

At the beginning of the current measurement period, the expected remaining service lives of all active employees in the plan was approximately 44,123 years. Additionally, the total plan membership (active employees and inactive employees) was 10,978. As a result, the average of the expected remaining service lives for purposes of recognizing the applicable deferred outflows and inflows of resources established in the current measurement period is 4.0000 years (rounded).

Additionally, differences between projected and actual earnings on plan investments should be recognized in pension expense using a systematic and rational method over a closed five-year period. For this purpose, the deferred outflows and inflows of resources are recognized in the pension expense as a level dollar amount over the closed period identified above.

Statement of Outflows and Inflows
Arising from Current Reporting Period
Fiscal Year Ended June 30, 2023 (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	$	34,409
2. Assumption Changes (gains) or losses		(72,825)
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		4
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		8,602
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes		(18,206)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(9,604)
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	$	25,807
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes		(54,619)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(28,812)
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(31,322)
2. Recognition period for Assets {in years}		5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets		(6,264)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(25,058)

Statement of Outflows and Inflows
Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30, 2023 (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	$ 72,080	$ 37,195	$ 34,885
2. Due to Assets	48,542	61,248	(12,706)
3. Totals	$ 120,622	$ 98,443	$ 22,179

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	$ 18,167	$ 948	$ 17,219
2. Assumption Changes	53,913	36,247	17,666
3. Net Difference between projected and actual earnings on pension plan investments	48,542	61,248	(12,706)
4. Totals	$ 120,622	$ 98,443	$ 22,179

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	$ 40,153	$ 1,894	$ 38,259
2. Assumption Changes	107,825	90,701	17,124
3. Net Difference between projected and actual earnings on pension plan investments*	128,759	135,028	(6,269)
4. Total	$ 276,737	$ 227,623	$ 49,114

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
2024	$ 20,094
2025	10,821
2026	24,464
2027	(6,265)
2028	-
Thereafter	-
Total	$ 49,114

** Paragraph 71(b) of GASB Statement No. 68 requires deferred outflows and inflows arising from differences between projected and actual earnings on pension plan investments to be aggregated and shown as a net amount. For purposes of this valuation, amounts are shown separately for calculation purposes.*

Recognition of Deferred Outflows and Inflows of Resources
Fiscal Year Ended June 30, 2023 (Dollars in Thousands)

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2019	$ 8,180	5.0000	$ 1,636	$ -	0.0000
2020	7,550	5.0000	1,510	1,510	1.0000
2021	(4,738)	5.0000	(948)	(1,894)	2.0000
2022	25,674	4.0000	6,419	12,836	2.0000
2023	34,409	4.0000	8,602	25,807	3.0000
Total			**$ 17,219**	**$ 38,259**	
Deferred Outflow (Inflow) due to Assumption Changes					
2021	$ 269,564	5.0000	$ 53,913	$ 107,825	2.0000
2022	(72,164)	4.0000	(18,041)	(36,082)	2.0000
2023	(72,825)	4.0000	(18,206)	(54,619)	3.0000
Total			**$ 17,666**	**$ 17,124**	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2019	$ 2,231	5.0000	$ 447	$ -	0.0000
2020	38,814	5.0000	7,763	7,762	1.0000
2021	(274,922)	5.0000	(54,984)	(109,970)	2.0000
2022	201,661	5.0000	40,332	120,997	3.0000
2023	(31,322)	5.0000	(6,264)	(25,058)	4.0000
Total			**$ (12,706)**	**$ (6,269)**	
Deferred Outflow (Inflow) due to All Sources					
Total			**$ 22,179**	**$ 49,114**	

Statement of Fiduciary Net Position as of June 30, 2023 (Dollars in Thousands)

Assets		June 30, 2023
Cash & Short-term Investments	$	53,256
Receivables		2,775
Investment Pools (at fair value)		1,541,770
Securities Lending Collateral		82,398
Capital Assets		-
Total Assets	**$**	**1,680,199**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(84,569)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**1,595,630**

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2023 (Dollars in Thousands)

1. Net position at market value at beginning of year	**$**	**1,473,921**
Additions		
2. Contributions		
a. Employee	$	29,843
b. Employer		58,521
c. Other sources		-
d. Total contributions	$	88,364
3. Investment income		
a. Investment income/(loss)	$	132,108
b. Investment expenses		(1,594)
c. Net investment income/(loss)	$	130,514
4. Other Additions		10
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**218,888**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(92,863)
b. Refunds		(3,345)
c. Total benefits paid	$	(96,208)
7. Expenses		
a. Other deductions	$	(1)
b. Administrative		(970)
c. Total expenses	$	(971)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(97,179)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**121,709**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**1,595,630**
11. State Board of Investment calculated annual investment return for the Correctional Employees Retirement Fund*		8.9%

** The fiscal year 2023 investment return for the Combined Funds is 8.9%.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2023 (Dollars in Thousands)

A. Total Pension Liability		
1. Service Cost	$	55,557
2. Interest on the Total Pension Liability		138,597
3. Changes of benefit terms		950
4. Difference between expected and actual experience of the Total Pension Liability		34,409
5. Changes of assumptions		(72,825)
6. Benefit payments, including refunds of employee contributions		(96,208)
7. Net change in Total Pension Liability	$	60,480
8. Total Pension Liability – Beginning		2,073,612
9. Total Pension Liability – Ending	**$**	**2,134,092**
B. Plan Fiduciary Net Position		
1. Contributions – Employer	$	58,521
2. Contributions – Employee		29,843
3. Net investment income		130,514
4. Benefit payments, including refunds of employee contributions		(96,208)
5. Pension Plan Administrative Expense		(970)
6. Other changes		9
7. Net change in Plan Fiduciary Net Position	$	121,709
8. Plan Fiduciary Net Position – Beginning		1,473,921
9. Plan Fiduciary Net Position – Ending	**$**	**1,595,630**
C. Net Pension Liability, *A.9 - B.9.*	**$**	**538,462**
D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability, *B.9 / A.9.*		**74.77%**
E. Covered-Employee payroll	**$**	**310,865** [1]
F. Net Pension Liability as a percentage of Covered-Employee payroll, *C. / E.*		**173.21%**

[1] *Assumed equal to actual member contributions divided by member contribution rate.*

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

Last 10 Fiscal Years

Fiscal year ending June 30,	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Total Pension Liability										
Service Cost	$ 55,557	$ 56,990	$ 47,383	$ 46,258	$ 44,912	$ 85,364	$ 95,522	$ 56,718	$ 48,805	$ 54,443
Interest on the Total Pension Liability	138,597	130,414	123,942	117,205	110,664	108,421	95,307	97,571	92,039	85,702
Benefit Changes	950	-	-	-	-	(164,182)	-	-	-	-
Difference between Expected and Actual Experience	34,409	25,674	(4,738)	7,550	8,180	(3,499)	6,566	(764)	7,115	4,103
Assumption Changes	(72,825)	(72,164)	269,564	-	-	(617,840)	(213,159)	576,552	118,399	(147,067)
Benefit Payments	(92,863)	(87,102)	(81,829)	(77,045)	(72,419)	(67,622)	(63,221)	(59,045)	(54,909)	(50,842)
Refunds	(3,345)	(3,240)	(2,136)	(2,488)	(2,484)	(2,052)	(1,466)	(1,895)	(1,590)	(1,447)
Net Change in Total Pension Liability	**$ 60,480**	**$ 50,572**	**$ 352,186**	**$ 91,480**	**$ 88,853**	**$ (661,410)**	**$ (80,451)**	**$ 669,137**	**$ 209,859**	**$ (55,108)**
Total Pension Liability - Beginning	**$ 2,073,612**	**$ 2,023,040**	**$ 1,670,854**	**$ 1,579,374**	**$ 1,490,521**	**$ 2,151,931**	**$ 2,232,382**	**$ 1,563,245**	**$ 1,353,386**	**$ 1,408,494**
Total Pension Liability - Ending (a)	**$ 2,134,092**	**$ 2,073,612**	**$ 2,023,040**	**$ 1,670,854**	**$ 1,579,374**	**$ 1,490,521**	**$ 2,151,931**	**$ 2,232,382**	**$ 1,563,245**	**$ 1,353,386**
Plan Fiduciary Net Position										
Employer Contributions	$ 58,521	$ 55,104	$ 48,823	$ 43,658	$ 38,245	$ 32,893	$ 31,763	$ 30,678	$ 29,480	$ 26,468
Employee Contributions	29,843	28,270	27,136	26,734	25,686	23,417	22,648	21,953	21,061	18,855
Pension Plan Net Investment Income	130,514	(99,155)	366,352	49,608	80,942	105,263	135,359	(195)	38,624	137,523
Benefit Payments	(92,863)	(87,102)	(81,829)	(77,045)	(72,419)	(67,622)	(63,221)	(59,045)	(54,909)	(50,842)
Refunds	(3,345)	(3,240)	(2,136)	(2,488)	(2,484)	(2,052)	(1,466)	(1,895)	(1,590)	(1,447)
Pension Plan Administrative Expense	(970)	(909)	(950)	(924)	(856)	(827)	(856)	(906)	(720)	(657)
Other Changes	9	-	20	(1)	(6)	(2)	(2)	-	-	(1)
Net Change in Plan Fiduciary Net Position	**$ 121,709**	**$ (107,032)**	**$ 357,416**	**$ 39,542**	**$ 69,108**	**$ 91,070**	**$ 124,225**	**$ (9,410)**	**$ 31,946**	**$ 129,899**
Plan Fiduciary Net Position - Beginning	**$ 1,473,921**	**$ 1,580,953**	**$ 1,223,537**	**$ 1,183,995**	**$ 1,114,887**	**$ 1,023,817**	**$ 899,592**	**$ 909,002**	**$ 877,056**	**$ 747,157**
Plan Fiduciary Net Position - Ending (b)	**$ 1,595,630**	**$ 1,473,921**	**$ 1,580,953**	**$ 1,223,537**	**$ 1,183,995**	**$ 1,114,887**	**$ 1,023,817**	**$ 899,592**	**$ 909,002**	**$ 877,056**
Net Pension Liability - Ending (a) - (b)	**$ 538,462**	**$ 599,691**	**$ 442,087**	**$ 447,317**	**$ 395,379**	**$ 375,634**	**$ 1,128,114**	**$ 1,332,790**	**$ 654,243**	**$ 476,330**
Plan Fiduciary Net Position as a Percentage										
of Total Pension Liability	**74.77 %**	**71.08 %**	**78.15 %**	**73.23 %**	**74.97 %**	**74.80 %**	**47.58 %**	**40.30 %**	**58.15 %**	**64.80 %**
Covered-Employee Payroll (1)	**$ 310,865**	**$ 294,479**	**$ 282,667**	**$ 278,479**	**$267,563**	**$257,330**	**$248,879**	**$241,242**	**$231,440**	**$219,244**
Net Pension Liability as a Percentage										
of Covered-Employee Payroll	**173.21 %**	**203.64 %**	**156.40 %**	**160.63 %**	**147.77 %**	**145.97 %**	**453.28 %**	**552.47 %**	**282.68 %**	**217.26 %**

Notes to Schedule:

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

Schedule of Net Pension Liability Multiyear
(Dollars in Thousands)

Last 10 Fiscal Years

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)
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
2016	2,232,382	899,592	1,332,790	40.30	241,242	552.47
2017	2,151,931	1,023,817	1,128,114	47.58	248,879	453.28
2018	1,490,521	1,114,887	375,634	74.80	257,330	145.97
2019	1,579,374	1,183,995	395,379	74.97	267,563	147.77
2020	1,670,854	1,223,537	447,317	73.23	278,479	160.63
2021	2,023,040	1,580,953	442,087	78.15	282,667	156.40
2022	2,073,612	1,473,921	599,691	71.08	294,479	203.64
2023	2,134,092	1,595,630	538,462	74.77	310,865	173.21

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 [2]	Actual Contribution as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b)/(d)
2014	$ 38,390	$ 26,468	$ 11,922	$ 219,244	12.07%
2015	40,109	29,480	10,629	231,440	12.74
2016	44,171	30,678	13,493	241,242	12.72
2017	45,943	31,763	14,180	248,879	12.76
2018	49,665	32,893	16,772	257,330	12.78
2019	43,265	38,245	5,020	267,563	14.29
2020	45,726	43,658	2,068	278,479	15.68
2021	46,781	48,823	(2,042)	282,667	17.27
2022	44,614	55,104	(10,490)	294,479	18.71
2023	45,604	58,521	(12,917)	310,865	18.83

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Fiscal Year Ending June 30, 2023 Contribution Rates Reported in this Schedule:

Notes	(1) Actuarially determined contribution rates are calculated as of each June 30 and apply to the fiscal year beginning on the day after the measurement date. (2) Assumed equal to actual member contributions divided by employee contribution rate.
Valuation Date	June 30, 2022
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	2.25%
Payroll Growth	3.00%
Salary Increases	Service based tables ranging from 11.50% with one year of service to 3.00% with 25 or more years of service, including inflation.
Investment Rate of Return	7.50%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2021 valuation pursuant to an experience study of the period 2015-2019.
Healthy Post-Retirement Mortality	PUB-2010 General Retired Mortality Table adjusted for mortality improvements using mortality improvement Scale MP-2019.

Other Information

Benefit Increases After Retirement	1.5% per annum.

See separate funding actuarial valuation report as of July 1, 2022 for additional detail. To obtain this report, contact MSRS as noted on page 3. This report is also available online at https://www.msrs.state.mn.us/annual-reports-fy-2022

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2014	18.6 %
2015	4.4
2016	(0.0)
2017	15.2
2018	10.4
2019	7.3
2020	4.2
2021	30.2
2022	(6.3)
2023	8.9

[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, 2023, the annual money-weighted rate of return for the Correctional Employees Retirement Fund was 8.9%. 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.

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. 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, 2023, these estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric Mean)
Domestic Equity	33.5%	5.10%
International Equity	16.5%	5.30%
Private Markets	25.0%	5.90%
Fixed Income	25.0%	0.75%
Total	100.0%	

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.

For purposes of this valuation, the long-term expected rate of return assumption is 7.00%. This assumption is based the State Employees Retirement Fund experience study report dated June 29, 2023.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

Single Discount Rate

A Single Discount Rate of 7.00% 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 7.00%. The projection of cash flows used to determine this single discount rate assumed that plan member, employer, and state 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 7.00%, 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 (6.00%) or 1-percentage-point higher (8.00%) than the current rate.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 6.00%	Current Single Discount Rate Assumption 7.00%	1% Increase 8.00%
Total Pension Liability	$ 2,449,980	$ 2,134,092	$ 1,877,670
Net Position Restricted for Pensions	1,595,630	1,595,630	1,595,630
Net Pension Liability	**$ 854,350**	**$ 538,462**	**$ 282,040**

For more information on the calculation of the Single Discount Rate, refer to Section G of this report.

Note that we believe the 8.00% interest rate assumption does not comply with Actuarial Standards of Practice.

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	**$ 2,073,612**	**$ 1,473,921**	**$ 599,691**	**$ 362,950**	**$ 221,919**	
Changes for the Year:						
Service Cost	$ 55,557		$ 55,557			$ 55,557
Interest on Total Pension Liability	138,597		138,597			138,597
Interest on Plan Fiduciary Net Position [1]		$ 99,192 [1]	(99,192)			(99,192)
Changes in Benefit Terms	950		950			950
Liability Experience Gains and Losses	34,409		34,409	$ 25,807	$ -	8,602
Changes in Assumptions	(72,825)		(72,825)	-	54,619	(18,206)
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(9,565)	(948)	8,617
Assumption Changes				(53,913)	(18,041)	35,872
Investment Gains/(Losses)				(48,542)	(54,984)	(6,442)
Contributions - Employer		58,521	(58,521)			
Contributions - Employees		29,843	(29,843)			(29,843)
Asset Gain/(Loss) [1]		31,322 [1]	(31,322)	-	25,058	(6,264)
Benefit Payment and Refunds	(96,208)	(96,208)				
Administrative Expenses		(970)	970			970
Other Changes		9	(9)			(9)
Net Changes	**$ 60,480**	**$ 121,709**	**$ (61,229)**	**$ (86,213)**	**$ 5,704**	**$ 89,209**
Balance End of Year	**$ 2,134,092**	**$ 1,595,630**	**$ 538,462**	**$ 276,737**	**$ 227,623**	

[1] *The sum of these items in column (b) equals the net investment income of $130,514.*

Summary of Population Statistics

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on July 1, 2022	**4,420**	**1,475**	**1,169**	**3,294**	**330**	**290**	**10,978**
New members	611						**611**
Return to active	34	(24)	(10)	0	0	0	**0**
Terminated non-vested	(215)	0	215	0	0	0	**0**
Service retirements	(153)	(47)	0	200	0	0	**0**
Terminated deferred	(138)	138	0	0	0	0	**0**
Terminated refund/transfer	(116)	(13)	(167)	0	0	0	**(296)**
Deaths	(7)	(1)	(5)	(58)	(9)	(5)	**(85)**
New beneficiary	0	0	0	0	0	22	**22**
Disabled	(10)	0	0	0	10	0	**0**
Data adjustments	0	16	107	12	4	(1)	**138**
Net change	6	69	140	154	5	16	**390**
Members on July 1, 2023	**4,426**	**1,544**	**1,309**	**3,448**	**335**	**306**	**11,368**

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 as of	Member	Regular Employer	Supplemental Employer	Total
July 1, 2021	9.60%	14.40%	4.45%	28.45%

Supplemental employer contribution remains in effect until the plan is 100% funded on a market value of assets basis for a minimum of three consecutive years.

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

Additional one-time direct state aid payment of $10,446,018, payable October 1, 2023.

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; and 100% vested after 10 years of Allowable Service.

Summary of Plan Provisions (Continued)

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 5/10% (2/12% if hired before July 1, 2010 and retire before July 1, 2015) per month for each month that the member is under age 55.

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	1.50% per year. 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. An additional one-time, non-compounding benefit increase of 1.00%, payable for calendar year 2024 in a lump sum by March 31, 2024, to benefit recipients who have been receiving a benefit for at least 12 full months as of June 30, 2023.

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).

Summary of Plan Provisions (Continued)

Disability (Continued)	
<u>Duty Disability (Continued)</u>	
Amount (Continued)	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.
<u>Regular Disability</u>	
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.
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.
<u>Benefit Increases</u>	Same as for retirement.
Death	
<u>Surviving spouse benefit</u>	
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.

Summary of Plan Provisions (Continued)

Death (Continued)	
<u>**Surviving spouse benefit (Continued)**</u>	
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.
<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 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.
<u>**Refund of contributions with interest**</u>	
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.
Amount	Member's contributions with 6.00% interest through June 30, 2011. Beginning July 1, 2011, a member's contributions increase with 4.00% interest. Beginning July 1, 2018, member contributions increase with 3.00% interest.
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. Beginning July 1, 2011, a member's contributions increase with 4.00% interest. Beginning July 1, 2018, member contributions increase with 3.00% interest. If a member is vested, a deferred annuity may be elected in lieu of a refund.

Summary of Plan Provisions (Continued)

Termination (Continued)	
<u>Deferred benefit</u>	
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; (e.) 2.00% from January 1, 2012 to December 31, 2018; and (f.) 0.00% thereafter. Amount is payable at normal or early retirement.
Optional form conversion factors	Actuarially equivalent factors based on the RP-2014 mortality table for healthy annuitants for a member turning age 56 in 2021, reflecting projected mortality improvements using Scale MP-2017, white collar adjustment, male rates set forward two years, female rates set forward one year, blended 70% males, 5.91% post-retirement interest, and 7.50% pre-retirement interest. Reflecting statutory requirements, joint and survivor factors are based on an interest assumption of 6.50%.
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)

Changes in plan provisions	Supplemental employer contributions will continue until the Plan is fully funded for a minimum of three consecutive years on a market value of assets basis. These contributions were previously due to expire upon attainment of fully funded status on a market value of assets basis. An additional one-time direct state aid contribution of $10.4 million will be contributed to the Plan on October 1, 2023. A one-time, non-compounding benefit increase of 1.00% will be payable in a lump sum for calendar year 2024 by March 31, 2024.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Actuarial Methods Used for the Determination of Total Pension Liability and Related Values

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; and

(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.

Asset Valuation Method

Fair value of assets.

Summary of Actuarial Assumptions Used in the Determination of Total Pension Liability and Related Values

The following assumptions were used in valuing the liabilities and benefits under the plan. The assumptions are based on the experience study dated June 30, 2020 and a review of inflation and investment assumptions included in the State Employees Retirement Fund Experience Study report dated June 29, 2023. The Allowance for Combined Service Annuity assumptions are based on an analysis completed by the LCPR actuary and documented in a report dated October 2016.

Investment return	7.00% per annum.
Single discount rate	7.00% 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.
Inflation	2.25% per year.
Payroll growth	3.00% per year.
Mortality rates	
Healthy pre-retirement	Pub-2010 General Employee Mortality Table adjusted for mortality improvements using mortality improvement Scale MP-2019.
Healthy post-retirement	Pub-2010 General Retired Mortality Table adjusted for mortality improvements using mortality improvement Scale MP-2019.
Disabled	Pub-2010 General Disabled Mortality Table adjusted for mortality improvements using mortality improvement Scale MP-2019.
Notes	The Pub-2010 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 18 to 80 and the annuitant mortality table contains mortality rates for ages 50 to 120. We have extended the annuitant mortality table as needed for members younger than age 50 who are receiving a benefit by deriving rates based on the employee table and the juvenile table. Similarly, we have extended the employee table as needed for members older than age 80 by deriving rates based on the annuitant 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. Note that plan changes reflected in this report may result in behavior changes that are not anticipated in the current retirement rates.
Withdrawal	Service-related rates are based on experience; see table of sample rates.
Disability	Age-related rates based on experience; see table of sample rates. All incidences are assumed to be duty-related.

Summary of Actuarial Assumptions (Continued)

Allowance for combined service annuity	Liabilities for former members are increased by 17.0% for vested members and 6.0% for non-vested members to account for the effect of some participants having eligibility for a Combined Service Annuity.
Administrative expenses	In the valuation year, equal to prior year administrative expenses expressed as a percentage of prior year projected payroll. In each subsequent year, equal to the initial administrative expense percentage applied to payroll for the closed group.
Refund of contributions	For non-vested members, account balances accumulate interest until the assumed commencement date and are discounted back to the valuation date. Active members decrementing after becoming eligible for a benefit are assumed to take the contributions accumulated with interest if larger than the value of the 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	75% of active male members are assumed to be married and 60% of active female 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.
Form of payment	Married members retiring from active status are assumed to elect subsidized Joint and Survivor form of annuity as follows: Males: 12.5% elect 50% Joint & Survivor option 12.5% elect 75% Joint & Survivor option 65.0% elect 100% Joint & Survivor option Females: 15.0% elect 50% Joint & Survivor option 10.0% elect 75% Joint & Survivor option 50.0% elect 100% Joint & Survivor option Remaining 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.

Summary of Actuarial Assumptions (Continued)

Decrement operation	Withdrawal decrements do not operate during retirement eligibility. Decrements are assumed to occur mid-fiscal year.
Service credit accruals	It is assumed that members accrue one year of service credit per year.
Pay increases	Pay increases are assumed to happen at the beginning of the fiscal year. This is equivalent to assuming that reported earnings are pensionable earnings for the year ending on the valuation date.
Final average salary	For present value of future benefit purposes, final average salary was calculated in accordance with pay increase assumptions, but was not permitted to fall below the final average salary reported in the data.
Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members</u>: There were 68 members reported with zero or invalid salary. We used prior year salary (52 members), if available, otherwise, high five salary with a 10% load to account for salary increases (10 members). If neither pay or high five salary was available, we assumed a value of $45,000 (6 members). There were 2 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 53 members reported without a gender and 0 members reported with an invalid date of birth. We assumed members are male. <u>Data for terminated members</u>: There were no members reported with missing or invalid gender or birth dates. There were 36 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 (14 members), we assumed a value of $45,000. There were 0 members reported without Credited Service and 0 members reported without a Termination Date.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members (Concluded)	Data for members receiving benefits: There were 7 members reported with a missing gender. We assumed male gender for retirees and female gender for survivors. There were 0 members reported with a missing or invalid birth date. There were no survivors reported on the data file with an expired benefit. There were 6 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 was 1 retiree 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 "pop-up," if any. There were 23 retirees reported with a bounceback annuity and an unreasonable 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 4 retirees reported with an accelerated benefit election, are younger than the accelerated age, and are missing accelerated benefit amount and end date. Due to the small number of affected members, we did not modify the valuation data. There were retired members reported with a survivor option and an invalid or missing survivor gender (357 members) and/or survivor date of birth (300 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.
Changes in actuarial assumptions since the prior valuation	The investment return rate and single discount rate were changed from 6.75% to 7.00%

Summary of Actuarial Assumptions (Continued)

	Percentage of Members Dying Each Year*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality**	
Age in 2023	Male	Female	Male	Female	Male	Female
20	0.04%	0.01%	0.04%	0.01%	0.44%	0.26%
25	0.03	0.01	0.03	0.01	0.34	0.21
30	0.05	0.02	0.05	0.02	0.51	0.36
35	0.07	0.03	0.07	0.03	0.69	0.56
40	0.09	0.04	0.09	0.04	0.85	0.76
45	0.12	0.07	0.10	0.06	1.06	0.99
50	0.28	0.21	0.14	0.08	1.50	1.41
55	0.41	0.29	0.21	0.13	2.03	1.80
60	0.63	0.41	0.33	0.20	2.57	2.07
65	0.91	0.59	0.47	0.29	3.05	2.18
70	1.41	0.95	0.65	0.44	3.62	2.56
75	2.39	1.68	0.98	0.72	4.64	3.56
80	4.28	3.09	1.55	1.22	6.59	5.52
85	7.84	5.83	6.59	5.01	9.87	8.76
90	13.58	10.85	13.58	10.85	15.04	12.91

* *Generally, mortality rates are expected to increase as age increases (with the exception of young ages, where expected mortality may decrease as age increases). In cases where the application of the projection scale would reverse the nature of this trend, standard mortality rates have been adjusted slightly. The adjustment has no material effect on results.*

** *Rates are adjusted for mortality improvements using Scale MP-2019 from a base year of 2010.*

	Percent of Members Decrementing Each Year	
	Disability Retirement	
Age	Male	Female
20	0.05%	0.05%
25	0.08	0.08
30	0.11	0.11
35	0.15	0.15
40	0.22	0.22
45	0.28	0.28
50	0.38	0.38
55	0.70	0.70
60	0.70	0.70
65	0.70	0.70
70	0.70	0.70

Summary of Actuarial Assumptions (Concluded)

	Percent	Salary Scale		Percent of Members Terminating (Withdrawing) Each Year		
Age	Retiring	Year	Increase	Year	Males	Females
50	4%	1	11.50%	1	20.00%	25.00%
51	3	2	7.00	2	15.00	15.00
52	3	3	5.00	3	10.00	15.00
53	3	4	5.00	4	10.00	15.00
54	3	5	4.75	5	8.50	12.50
55	50	6	4.75	6	7.75	10.00
56	30	7	4.75	7	6.75	10.00
57	15	8	4.75	8	5.50	10.00
58	15	9	4.50	9	5.00	10.00
59	15	10	4.50	10	2.75	7.50
60	15	11	4.50	11	2.75	7.25
61	15	12	4.50	12	2.50	7.00
62	30	13	4.25	13	2.25	5.00
63	30	14	4.00	14	2.25	5.00
64	15	15	3.75	15	2.00	4.00
65	30	16	3.75	16	2.00	4.00
66	30	17	3.75	17	2.00	4.00
67	25	18	3.50	18	1.50	4.00
68	25	19	3.50	19	1.25	3.00
69	25	20	3.50	20	1.00	3.00
70+	100	21	3.25	21	1.00	2.50
		22	3.25	22	1.00	2.25
		23	3.25	23	1.00	1.50
		24	3.25	24	1.00	0.75
		25+	3.00	25+	0.00	0.00

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 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 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 7.00%; the municipal bond rate is 3.86% (based on the weekly rate closest to but not later than the measurement date of the “20-Year Municipal GO Index” as published by Fidelity) and **the resulting single discount rate as of June 30, 2023 is 7.00%**. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.

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			
Fiscal Year Ending	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[1]	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) x 9.60%	(e) = (a) x 14.40%[2]	(f)	(g) = (d) + (e) + (f)
2023	$ 310,865		$ 310,865				
2024	306,746	$ 10,286	317,032	$ 29,448	$ 68,268	$ 1,091	$ 98,807
2025	289,408	37,135	326,543	27,783	54,553	3,940	86,276
2026	272,935	63,405	336,340	26,202	51,448	6,727	84,377
2027	257,527	88,903	346,430	24,723	48,544	9,433	82,700
2028	244,356	112,467	356,823	23,458	46,061	11,933	81,452
2029	232,749	134,778	367,527	22,344	43,873	14,300	80,517
2030	221,694	156,859	378,553	21,283	41,789	16,643	79,715
2031	211,290	178,620	389,910	20,284	39,828	18,952	79,064
2032	201,349	200,258	401,607	19,330	37,954	21,247	78,531
2033	191,648	222,007	413,655	18,398	36,126	23,555	78,079
2034	181,871	244,194	426,065	17,460	34,283	25,909	77,652
2035	171,986	266,861	438,847	16,511	32,419	28,314	77,244
2036	161,727	290,285	452,012	15,526	30,486	30,799	76,811
2037	151,095	314,478	465,573	14,505	28,481	33,366	76,352
2038	140,434	339,106	479,540	13,482	26,472	35,979	75,933
2039	130,238	363,688	493,926	12,503	24,550	38,587	75,640
2040	120,176	388,568	508,744	11,537	22,653	41,227	75,417
2041	109,968	414,038	524,006	10,557	20,729	43,929	75,215
2042	100,430	439,296	539,726	9,641	18,931	46,609	75,181
2043	91,570	464,348	555,918	8,791	17,261	49,267	75,319
2044	83,291	489,305	572,596	7,996	15,700	51,915	75,611
2045	75,284	514,490	589,774	7,227	14,191	54,587	76,005
2046	67,304	540,163	607,467	6,461	12,687	57,311	76,459
2047	59,760	565,931	625,691	5,737	11,265	60,045	77,047
2048	52,882	591,579	644,461	5,077	9,968	62,767	77,812
2049	46,647	617,148	663,795	4,478	8,793	65,479	78,750
2050	40,760	642,949	683,709	3,913	5,869	39,606	49,388
2051	34,993	669,227	704,220	3,359	5,039	41,224	49,622
2052	29,799	695,548	725,347	2,861	4,291	42,846	49,998
2053	25,090	722,017	747,107	2,409	3,613	44,476	50,498
2054	20,507	749,014	769,521	1,969	2,953	46,139	51,061
2055	16,445	776,161	792,606	1,579	2,368	47,812	51,759
2056	13,155	803,229	816,384	1,263	1,894	49,479	52,636
2057	10,406	830,470	840,876	999	1,498	51,157	53,654
2058	8,077	858,025	866,102	775	1,163	52,854	54,792
2059	6,254	885,831	892,085	600	901	54,567	56,068
2060	4,866	913,982	918,848	467	701	56,301	57,469
2061	3,752	942,661	946,413	360	540	58,068	58,968
2062	2,863	971,943	974,806	275	412	59,872	60,559
2063	2,169	1,001,881	1,004,050	208	312	61,716	62,236
2064	1,617	1,032,554	1,034,171	155	233	63,605	63,993
2065	1,169	1,064,028	1,065,197	112	168	65,544	65,824
2066	821	1,096,331	1,097,152	79	118	67,534	67,731
2067	569	1,129,498	1,130,067	55	82	69,577	69,714
2068	384	1,163,585	1,163,969	37	55	71,677	71,769
2069	241	1,198,647	1,198,888	23	35	73,837	73,895
2070	142	1,234,713	1,234,855	14	20	76,058	76,092
2071	82	1,271,818	1,271,900	8	12	78,344	78,364
2072	43	1,310,014	1,310,057	4	6	80,697	80,707
2073	18	1,349,341	1,349,359	2	3	83,119	83,124

1. *Equal to total contributions (28.45% of payroll for 26 years and 24.00% of payroll thereafter for new employee payroll) net of new employee normal cost and expenses (17.84% of pay). Includes an additional $10.4 million in one-time state aid in 2024.*
2. *Ultimate contribution rate; projected 2023 through 2049 employer contributions are based on a 18.85% of pay contribution and the projected 2023 employer contribution includes an additional $10.4 million in one-time State aid.*

Single Discount Rate Development
Projection of Contributions (Dollars in Thousands) (Concluded)

	Projected Covered-Employee Payroll			Projected Contributions			
Fiscal Year Ending	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[1]	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) x 9.60%	(e) = (a) x 14.40%[2]	(f)	(g) = (d) + (e) + (f)
2074	$ 6	$ 1,389,834	$ 1,389,840	$ 1	$ 1	$ 85,614	$ 85,616
2075	1	1,431,534	1,431,535	-	-	88,182	88,182
2076	-	1,474,481	1,474,481	-	-	90,828	90,828
2077	-	1,518,716	1,518,716	-	-	93,553	93,553
2078	-	1,564,277	1,564,277	-	-	96,359	96,359
2079	-	1,611,205	1,611,205	-	-	99,250	99,250
2080	-	1,659,542	1,659,542	-	-	102,228	102,228
2081	-	1,709,328	1,709,328	-	-	105,295	105,295
2082	-	1,760,608	1,760,608	-	-	108,453	108,453
2083	-	1,813,426	1,813,426	-	-	111,707	111,707
2084	-	1,867,829	1,867,829	-	-	115,058	115,058
2085	-	1,923,864	1,923,864	-	-	118,510	118,510
2086	-	1,981,579	1,981,579	-	-	122,065	122,065
2087	-	2,041,027	2,041,027	-	-	125,727	125,727
2088	-	2,102,258	2,102,258	-	-	129,499	129,499
2089	-	2,165,325	2,165,325	-	-	133,384	133,384
2090	-	2,230,285	2,230,285	-	-	137,386	137,386
2091	-	2,297,194	2,297,194	-	-	141,507	141,507
2092	-	2,366,109	2,366,109	-	-	145,752	145,752
2093	-	2,437,093	2,437,093	-	-	150,125	150,125
2094	-	2,510,206	2,510,206	-	-	154,629	154,629
2095	-	2,585,512	2,585,512	-	-	159,268	159,268
2096	-	2,663,077	2,663,077	-	-	164,046	164,046
2097	-	2,742,969	2,742,969	-	-	168,967	168,967
2098	-	2,825,258	2,825,258	-	-	174,036	174,036
2099	-	2,910,016	2,910,016	-	-	179,257	179,257
2100	-	2,997,317	2,997,317	-	-	184,635	184,635
2101	-	3,087,236	3,087,236	-	-	190,174	190,174
2102	-	3,179,853	3,179,853	-	-	195,879	195,879
2103	-	3,275,249	3,275,249	-	-	201,755	201,755
2104	-	3,373,506	3,373,506	-	-	207,808	207,808
2105	-	3,474,711	3,474,711	-	-	214,042	214,042
2106	-	3,578,953	3,578,953	-	-	220,463	220,463
2107	-	3,686,321	3,686,321	-	-	227,077	227,077
2108	-	3,796,911	3,796,911	-	-	233,890	233,890
2109	-	3,910,818	3,910,818	-	-	240,906	240,906
2110	-	4,028,143	4,028,143	-	-	248,134	248,134
2111	-	4,148,987	4,148,987	-	-	255,578	255,578
2112	-	4,273,457	4,273,457	-	-	263,245	263,245
2113	-	4,401,661	4,401,661	-	-	271,142	271,142
2114	-	4,533,710	4,533,710	-	-	279,277	279,277
2115	-	4,669,722	4,669,722	-	-	287,655	287,655
2116	-	4,809,813	4,809,813	-	-	296,285	296,285
2117	-	4,954,108	4,954,108	-	-	305,173	305,173
2118	-	5,102,731	5,102,731	-	-	314,328	314,328
2119	-	5,255,813	5,255,813	-	-	323,758	323,758
2120	-	5,413,487	5,413,487	-	-	333,471	333,471
2121	-	5,575,892	5,575,892	-	-	343,475	343,475
2122	-	5,743,169	5,743,169	-	-	353,779	353,779
2123	-	5,915,464	5,915,464	-	-	364,393	364,393

1. *Equal to total contributions (28.45% of payroll for 26 years and 24.00% of payroll thereafter for new employee payroll) net of new employee normal cost and expenses (17.84% of pay). Includes an additional $10.4 million in one-time state aid in 2024.*
2. *Ultimate contribution rate; projected 2023 through 2049 employer contributions are based on a 18.85% of pay contribution and the projected 2023 employer contribution includes an additional $10.4 million in one-time State aid.*

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

Fiscal Year Ending	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2024	$ 1,595,630	$ 98,807	$ 104,454	$ 982	$ 111,466	$ 1,700,467
2025	1,700,467	86,276	108,271	926	118,244	1,795,790
2026	1,795,790	84,377	113,581	873	124,670	1,890,383
2027	1,890,383	82,700	118,634	824	131,062	1,984,687
2028	1,984,687	81,452	123,742	782	137,446	2,079,061
2029	2,079,061	80,517	129,441	745	143,825	2,173,217
2030	2,173,217	79,715	135,282	709	150,189	2,267,130
2031	2,267,130	79,064	142,053	676	156,508	2,359,973
2032	2,359,973	78,531	148,837	644	162,757	2,451,780
2033	2,451,780	78,079	155,872	613	168,927	2,542,301
2034	2,542,301	77,652	163,415	582	174,990	2,630,946
2035	2,630,946	77,244	171,296	550	180,911	2,717,255
2036	2,717,255	76,811	179,779	518	186,647	2,800,416
2037	2,800,416	76,352	188,901	484	192,140	2,879,523
2038	2,879,523	75,933	197,845	449	197,356	2,954,518
2039	2,954,518	75,640	206,282	417	202,307	3,025,766
2040	3,025,766	75,417	214,862	385	206,992	3,092,928
2041	3,092,928	75,215	223,211	352	211,400	3,155,980
2042	3,155,980	75,181	230,949	321	215,548	3,215,439
2043	3,215,439	75,319	237,852	293	219,478	3,272,091
2044	3,272,091	75,611	244,082	267	223,240	3,326,593
2045	3,326,593	76,005	249,895	241	226,870	3,379,332
2046	3,379,332	76,459	255,552	215	230,384	3,430,408
2047	3,430,408	77,047	260,757	191	233,801	3,480,308
2048	3,480,308	77,812	265,174	169	237,169	3,529,946
2049	3,529,946	78,750	268,795	149	240,552	3,580,304
2050	3,580,304	49,388	272,013	130	242,957	3,600,506
2051	3,600,506	49,622	274,848	112	244,282	3,619,450
2052	3,619,450	49,998	276,925	95	245,550	3,637,978
2053	3,637,978	50,498	278,335	80	246,816	3,656,877
2054	3,656,877	51,061	279,475	66	248,120	3,676,517
2055	3,676,517	51,759	279,864	53	249,506	3,697,865
2056	3,697,865	52,636	279,261	42	251,051	3,722,249
2057	3,722,249	53,654	277,948	33	252,839	3,750,761
2058	3,750,761	54,792	276,006	26	254,941	3,784,462
2059	3,784,462	56,068	273,337	20	257,436	3,824,609
2060	3,824,609	57,469	270,027	16	260,409	3,872,444
2061	3,872,444	58,968	266,211	12	263,940	3,929,129
2062	3,929,129	60,559	261,939	9	268,110	3,995,850
2063	3,995,850	62,236	257,239	7	273,000	4,073,840
2064	4,073,840	63,993	252,150	5	278,695	4,164,373
2065	4,164,373	65,824	246,700	4	285,283	4,268,776
2066	4,268,776	67,731	240,890	3	292,856	4,388,470
2067	4,388,470	69,714	234,719	2	301,516	4,524,979
2068	4,524,979	71,769	228,214	1	311,366	4,679,899
2069	4,679,899	73,895	221,397	1	322,518	4,854,914
2070	4,854,914	76,092	214,269	-	335,090	5,051,827
2071	5,051,827	78,364	206,847	-	349,207	5,272,551
2072	5,272,551	80,707	199,159	-	365,003	5,519,102
2073	5,519,102	83,124	191,230	-	382,618	5,793,614

For purposes of this projection, we assumed the 14.4% regular member statutory contribution rate would continue after the plan becomes fully funded.

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

Fiscal Year Ending	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2074	$ 5,793,614	$ 85,614	$ 183,083	$ -	$ 402,199	$ 6,098,344
2075	6,098,344	88,182	174,751	-	423,906	6,435,681
2076	6,435,681	90,828	166,268	-	447,902	6,808,143
2077	6,808,143	93,553	157,672	-	474,364	7,218,388
2078	7,218,388	96,359	149,001	-	503,476	7,669,222
2079	7,669,222	99,250	140,293	-	535,434	8,163,613
2080	8,163,613	102,228	131,592	-	570,443	8,704,692
2081	8,704,692	105,295	122,941	-	608,722	9,295,768
2082	9,295,768	108,453	114,385	-	650,500	9,940,336
2083	9,940,336	111,707	105,969	-	696,021	10,642,095
2084	10,642,095	115,058	97,740	-	745,543	11,404,956
2085	11,404,956	118,510	89,739	-	799,337	12,233,064
2086	12,233,064	122,065	82,007	-	857,693	13,130,815
2087	13,130,815	125,727	74,580	-	920,917	14,102,879
2088	14,102,879	129,499	67,485	-	989,336	15,154,229
2089	15,154,229	133,384	60,745	-	1,063,296	16,290,164
2090	16,290,164	137,386	54,380	-	1,143,168	17,516,338
2091	17,516,338	141,507	48,402	-	1,229,348	18,838,791
2092	18,838,791	145,752	42,819	-	1,322,258	20,263,982
2093	20,263,982	150,125	37,634	-	1,422,350	21,798,823
2094	21,798,823	154,629	32,846	-	1,530,109	23,450,715
2095	23,450,715	159,268	28,451	-	1,646,052	25,227,584
2096	25,227,584	164,046	24,442	-	1,770,735	27,137,923
2097	27,137,923	168,967	20,810	-	1,904,753	29,190,833
2098	29,190,833	174,036	17,545	-	2,048,743	31,396,067
2099	31,396,067	179,257	14,634	-	2,203,390	33,764,080
2100	33,764,080	184,635	12,063	-	2,369,424	36,306,076
2101	36,306,076	190,174	9,818	-	2,547,631	39,034,063
2102	39,034,063	195,879	7,881	-	2,738,853	41,960,914
2103	41,960,914	201,755	6,231	-	2,943,992	45,100,430
2104	45,100,430	207,808	4,848	-	3,164,014	48,467,404
2105	48,467,404	214,042	3,707	-	3,399,956	52,077,695
2106	52,077,695	220,463	2,783	-	3,652,929	55,948,304
2107	55,948,304	227,077	2,048	-	3,924,124	60,097,457
2108	60,097,457	233,890	1,477	-	4,214,819	64,544,689
2109	64,544,689	240,906	1,041	-	4,526,382	69,310,936
2110	69,310,936	248,134	717	-	4,860,279	74,418,632
2111	74,418,632	255,578	482	-	5,218,082	79,891,810
2112	79,891,810	263,245	316	-	5,601,474	85,756,213
2113	85,756,213	271,142	202	-	6,012,258	92,039,411
2114	92,039,411	279,277	125	-	6,452,364	98,770,927
2115	98,770,927	287,655	76	-	6,923,860	105,982,366
2116	105,982,366	296,285	45	-	7,428,959	113,707,565
2117	113,707,565	305,173	26	-	7,970,030	121,982,742
2118	121,982,742	314,328	14	-	8,549,607	130,846,663
2119	130,846,663	323,758	8	-	9,170,407	140,340,820
2120	140,340,820	333,471	4	-	9,835,332	150,509,619
2121	150,509,619	343,475	2	-	10,547,492	161,400,584
2122	161,400,584	353,779	1	-	11,310,214	173,064,576
2123	173,064,576	364,393	-	-	12,127,059	185,556,028

For purposes of this projection, we assumed the 14.4% statutory regular member statutory contribution rate would continue after the plan becomes fully funded.

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

Fiscal Year Ending	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)
2024	$ 1,595,630	$ 104,454	$ 104,454	$ -	$ 100,979	$ -	$ 100,979
2025	1,700,467	108,271	108,271	-	97,822	-	97,822
2026	1,795,790	113,581	113,581	-	95,906	-	95,906
2027	1,890,383	118,634	118,634	-	93,619	-	93,619
2028	1,984,687	123,742	123,742	-	91,262	-	91,262
2029	2,079,061	129,441	129,441	-	89,220	-	89,220
2030	2,173,217	135,282	135,282	-	87,145	-	87,145
2031	2,267,130	142,053	142,053	-	85,521	-	85,521
2032	2,359,973	148,837	148,837	-	83,743	-	83,743
2033	2,451,780	155,872	155,872	-	81,964	-	81,964
2034	2,542,301	163,415	163,415	-	80,309	-	80,309
2035	2,630,946	171,296	171,296	-	78,674	-	78,674
2036	2,717,255	179,779	179,779	-	77,169	-	77,169
2037	2,800,416	188,901	188,901	-	75,780	-	75,780
2038	2,879,523	197,845	197,845	-	74,175	-	74,175
2039	2,954,518	206,282	206,282	-	72,279	-	72,279
2040	3,025,766	214,862	214,862	-	70,360	-	70,360
2041	3,092,928	223,211	223,211	-	68,313	-	68,313
2042	3,155,980	230,949	230,949	-	66,056	-	66,056
2043	3,215,439	237,852	237,852	-	63,580	-	63,580
2044	3,272,091	244,082	244,082	-	60,977	-	60,977
2045	3,326,593	249,895	249,895	-	58,345	-	58,345
2046	3,379,332	255,552	255,552	-	55,763	-	55,763
2047	3,430,408	260,757	260,757	-	53,176	-	53,176
2048	3,480,308	265,174	265,174	-	50,539	-	50,539
2049	3,529,946	268,795	268,795	-	47,878	-	47,878
2050	3,580,304	272,013	272,013	-	45,281	-	45,281
2051	3,600,506	274,848	274,848	-	42,760	-	42,760
2052	3,619,450	276,925	276,925	-	40,265	-	40,265
2053	3,637,978	278,335	278,335	-	37,822	-	37,822
2054	3,656,877	279,475	279,475	-	35,493	-	35,493
2055	3,676,517	279,864	279,864	-	33,217	-	33,217
2056	3,697,865	279,261	279,261	-	30,977	-	30,977
2057	3,722,249	277,948	277,948	-	28,814	-	28,814
2058	3,750,761	276,006	276,006	-	26,741	-	26,741
2059	3,784,462	273,337	273,337	-	24,750	-	24,750
2060	3,824,609	270,027	270,027	-	22,851	-	22,851
2061	3,872,444	266,211	266,211	-	21,054	-	21,054
2062	3,929,129	261,939	261,939	-	19,361	-	19,361
2063	3,995,850	257,239	257,239	-	17,770	-	17,770
2064	4,073,840	252,150	252,150	-	16,279	-	16,279
2065	4,164,373	246,700	246,700	-	14,885	-	14,885
2066	4,268,776	240,890	240,890	-	13,583	-	13,583
2067	4,388,470	234,719	234,719	-	12,370	-	12,370
2068	4,524,979	228,214	228,214	-	11,240	-	11,240
2069	4,679,899	221,397	221,397	-	10,191	-	10,191
2070	4,854,914	214,269	214,269	-	9,218	-	9,218
2071	5,051,827	206,847	206,847	-	8,316	-	8,316
2072	5,272,551	199,159	199,159	-	7,483	-	7,483
2073	5,519,102	191,230	191,230	-	6,715	-	6,715

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

Fiscal Year Ending	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)
2074	$ 5,793,614	$ 183,083	$ 183,083	$ -	$ 6,009	$ -	$ 6,009
2075	6,098,344	174,751	174,751	-	5,360	-	5,360
2076	6,435,681	166,268	166,268	-	4,766	-	4,766
2077	6,808,143	157,672	157,672	-	4,224	-	4,224
2078	7,218,388	149,001	149,001	-	3,731	-	3,731
2079	7,669,222	140,293	140,293	-	3,283	-	3,283
2080	8,163,613	131,592	131,592	-	2,878	-	2,878
2081	8,704,692	122,941	122,941	-	2,513	-	2,513
2082	9,295,768	114,385	114,385	-	2,185	-	2,185
2083	9,940,336	105,969	105,969	-	1,892	-	1,892
2084	10,642,095	97,740	97,740	-	1,631	-	1,631
2085	11,404,956	89,739	89,739	-	1,399	-	1,399
2086	12,233,064	82,007	82,007	-	1,195	-	1,195
2087	13,130,815	74,580	74,580	-	1,016	-	1,016
2088	14,102,879	67,485	67,485	-	859	-	859
2089	15,154,229	60,745	60,745	-	723	-	723
2090	16,290,164	54,380	54,380	-	605	-	605
2091	17,516,338	48,402	48,402	-	503	-	503
2092	18,838,791	42,819	42,819	-	416	-	416
2093	20,263,982	37,634	37,634	-	342	-	342
2094	21,798,823	32,846	32,846	-	279	-	279
2095	23,450,715	28,451	28,451	-	226	-	226
2096	25,227,584	24,442	24,442	-	181	-	181
2097	27,137,923	20,810	20,810	-	144	-	144
2098	29,190,833	17,545	17,545	-	114	-	114
2099	31,396,067	14,634	14,634	-	88	-	88
2100	33,764,080	12,063	12,063	-	68	-	68
2101	36,306,076	9,818	9,818	-	52	-	52
2102	39,034,063	7,881	7,881	-	39	-	39
2103	41,960,914	6,231	6,231	-	29	-	29
2104	45,100,430	4,848	4,848	-	21	-	21
2105	48,467,404	3,707	3,707	-	15	-	15
2106	52,077,695	2,783	2,783	-	10	-	10
2107	55,948,304	2,048	2,048	-	7	-	7
2108	60,097,457	1,477	1,477	-	5	-	5
2109	64,544,689	1,041	1,041	-	3	-	3
2110	69,310,936	717	717	-	2	-	2
2111	74,418,632	482	482	-	1	-	1
2112	79,891,810	316	316	-	1	-	1
2113	85,756,213	202	202	-	-	-	-
2114	92,039,411	125	125	-	-	-	-
2115	98,770,927	76	76	-	-	-	-
2116	105,982,366	45	45	-	-	-	-
2117	113,707,565	26	26	-	-	-	-
2118	121,982,742	14	14	-	-	-	-
2119	130,846,663	8	8	-	-	-	-
2120	140,340,820	4	4	-	-	-	-
2121	150,509,619	2	2	-	-	-	-
2122	161,400,584	1	1	-	-	-	-
2123	173,064,576	-	-	-	-	-	-
				Totals	$ 2,544,801	$ -	$ 2,544,801

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
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.
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 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 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 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).
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
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 age(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 postemployment 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.