Minnesota State Retirement System
Correctional Employees Retirement Fund

GASB Statement Nos. 67 and 68
Accounting and Financial Reporting for Pensions
June 30, 2024

| P: 800.521.0498 | www.grsconsulting.com

November 22, 2024

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, 2024 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

277 Coon Rapids Boulevard | Suite 212 | Coon Rapids, Minnesota 55433-2629

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:rmn

Table of Contents

SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2024 (Dollars in Thousands)

	2024
Actuarial Valuation Date	June 30, 2024
Measurement Date of the Net Pension Liability	June 30, 2024
Membership	
Number of	
- Service Retirements	3,574
- Survivors	326
- Disability Retirements	338
- Deferred Retirements	1,649
- Terminated Other Non-vested	1,517
- Active Members	4,476
- Total	11,880
Covered-Employee Payroll [1]	$ 331,010
Net Pension Liability	
Total Pension Liability	$ 2,264,140
Plan Fiduciary Net Position	1,792,602
Net Pension Liability	$ 471,538
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	79.17%
Net Pension Liability as a Percentage of Covered-Employee Payroll	142.45%
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]	3.97%
Last year ending June 30 in the 2025 to 2124 projection period for which projected benefit payments are fully funded	2124
Total Pension Expense/ (Income)	$ 72,201

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	$ 44,609	$ 947
Changes in assumptions	53,912	54,454
Net difference between projected and actual earnings on pension plan investments	80,665	141,018
Total	$ 179,186	$ 196,419

[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, 2024.

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-2024 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 24 years; and
3. The unfunded liability will grow initially as a dollar amount for two years (based on the current 24- year amortization period and if contributions are equal to the required 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, 2024 and a measurement date of June 30, 2024.

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 3.97% (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, 2024 (Dollars in Thousands)

A. Expense		
1. Service Cost	$	56,528
2. Interest on the Total Pension Liability		147,786
3. Current-Period Benefit Changes		-
4. Employee Contributions		(31,777)
5. Projected Earnings on Plan Investments		(111,736)
6. Pension Plan Administrative Expense		1,100
7. Other Changes in Plan Fiduciary Net Position		21
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		6,995
9. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Current Reporting Period		-
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.50%) and actual earnings on Pension Plan Investments		
Arising from Current Reporting Period		(16,810)
11. Increases/(Decreases) from Experience in the Current Reporting Period	**$**	**52,107**
12. Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
Arising from Prior Reporting Periods		15,583
13. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Prior Reporting Periods		17,666
14. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on Pension Plan Investments		
Arising from Prior Reporting Periods		(13,155)
15. Total Pension Expense / (Income)	**$**	**72,201**

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 43,674 years. Additionally, the total plan membership (active employees and inactive employees) was 11,368. 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, 2024 (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	$	27,981
2. Assumption Changes (gains) or losses		-
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		6,995
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes		-
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	6,995
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	$	20,986
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes		-
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	20,986
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(84,049)
2. Recognition period for Assets {in years}		5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets		(16,810)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(67,239)

Statement of Outflows and Inflows
Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30, 2024 (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	$ 77,438	$ 37,194	$ 40,244
2. Due to Assets	48,094	78,059	(29,965)
3. Totals	$ 125,532	$ 115,253	$ 10,279

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	$ 23,525	$ 947	$ 22,578
2. Assumption Changes	53,913	36,247	17,666
3. Net Difference between projected and actual earnings on pension plan investments	48,094	78,059	(29,965)
4. Totals	$ 125,532	$ 115,253	$ 10,279

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	$ 44,609	$ 947	$ 43,662
2. Assumption Changes	53,912	54,454	(542)
3. Net Difference between projected and actual earnings on pension plan investments*	80,665	141,018	(60,353)
4. Total	$ 179,186	$ 196,419	$ (17,233)

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
2025	$ 1,006
2026	14,649
2027	(16,079)
2028	(16,809)
2029	-
Thereafter	-
Total	$ (17,233)

** 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, 2024 (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					
2020	$ 7,550	5.0000	$ 1,510	$ -	0.0000
2021	(4,738)	5.0000	(947)	(947)	1.0000
2022	25,674	4.0000	6,418	6,418	1.0000
2023	34,409	4.0000	8,602	17,205	2.0000
2024	27,981	4.0000	6,995	20,986	3.0000
Total			**$ 22,578**	**$ 43,662**	
Deferred Outflow (Inflow) due to Assumption Changes					
2021	$ 269,564	5.0000	$ 53,913	$ 53,912	1.0000
2022	(72,164)	4.0000	(18,041)	(18,041)	1.0000
2023	(72,825)	4.0000	(18,206)	(36,413)	2.0000
Total			**$ 17,666**	**$ (542)**	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2020	$ 38,814	5.0000	$ 7,762	$ -	0.0000
2021	(274,922)	5.0000	(54,985)	(54,985)	1.0000
2022	201,661	5.0000	40,332	80,665	2.0000
2023	(31,322)	5.0000	(6,264)	(18,794)	3.0000
2024	(84,049)	5.0000	(16,810)	(67,239)	4.0000
Total			**$ (29,965)**	**$ (60,353)**	
Deferred Outflow (Inflow) due to All Sources					
Total			**$ 10,279**	**$ (17,233)**	

Statement of Fiduciary Net Position
as of June 30, 2024 (Dollars in Thousands)

Assets		June 30, 2024
Cash & Short-term Investments	$	33,180
Receivables		3,153
Investment Pools (at fair value)		1,759,802
Securities Lending Collateral		76,482
Capital Assets		-
Total Assets	**$**	**1,872,617**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(80,015)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**1,792,602**

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2024 (Dollars in Thousands)

1. Net position at market value at beginning of year	**$**	**1,595,630**
Additions		
2. Contributions		
a. Employee	$	31,777
b. Employer		62,332
c. Other sources		10,446
d. Total contributions	$	104,555
3. Investment income		
a. Investment income/(loss)	$	202,418
b. Investment expenses		(6,633)
c. Net investment income/(loss)	$	195,785
4. Other Additions		-
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**300,340**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(99,438)
b. Refunds		(2,809)
c. Total benefits paid	$	(102,247)
7. Expenses		
a. Other deductions	$	(21)
b. Administrative		(1,100)
c. Total expenses	$	(1,121)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(103,368)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**196,972**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**1,792,602**
11. State Board of Investment calculated annual investment return for the Correctional Employees Retirement Fund*		12.4%

** The fiscal year 2024 investment return for the Combined Funds is 12.3%.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2024 (Dollars in Thousands)

A. Total Pension Liability		
1. Service Cost	$	56,528
2. Interest on the Total Pension Liability		147,786
3. Changes of benefit terms		-
4. Difference between expected and actual experience of the Total Pension Liability		27,981
5. Changes of assumptions		-
6. Benefit payments, including refunds of employee contributions		(102,247)
7. Net change in Total Pension Liability	$	130,048
8. Total Pension Liability – Beginning		2,134,092
9. Total Pension Liability – Ending	**$**	**2,264,140**
B. Plan Fiduciary Net Position		
1. Contributions – Employer	$	72,778
2. Contributions – Employee		31,777
3. Net investment income		195,785
4. Benefit payments, including refunds of employee contributions		(102,247)
5. Pension Plan Administrative Expense		(1,100)
6. Other changes		(21)
7. Net change in Plan Fiduciary Net Position	$	196,972
8. Plan Fiduciary Net Position – Beginning		1,595,630
9. Plan Fiduciary Net Position – Ending	**$**	**1,792,602**
C. Net Pension Liability, *A.9 - B.9.*	**$**	**471,538**
D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability, *B.9 / A.9.*		**79.17%**
E. Covered-Employee payroll	**$**	**331,010** [1]
F. Net Pension Liability as a percentage of Covered-Employee payroll, *C. / E.*		**142.45%**

[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,	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015
Total Pension Liability										
Service Cost	$ 56,528	$ 55,557	$ 56,990	$ 47,383	$ 46,258	$ 44,912	$ 85,364	$ 95,522	$ 56,718	$ 48,805
Interest on the Total Pension Liability	147,786	138,597	130,414	123,942	117,205	110,664	108,421	95,307	97,571	92,039
Benefit Changes	-	950	-	-	-	-	(164,182)	-	-	-
Difference between Expected and Actual Experience	27,981	34,409	25,674	(4,738)	7,550	8,180	(3,499)	6,566	(764)	7,115
Assumption Changes	-	(72,825)	(72,164)	269,564	-	-	(617,840)	(213,159)	576,552	118,399
Benefit Payments	(99,438)	(92,863)	(87,102)	(81,829)	(77,045)	(72,419)	(67,622)	(63,221)	(59,045)	(54,909)
Refunds	(2,809)	(3,345)	(3,240)	(2,136)	(2,488)	(2,484)	(2,052)	(1,466)	(1,895)	(1,590)
Net Change in Total Pension Liability	**$ 130,048**	**$ 60,480**	**$ 50,572**	**$ 352,186**	**$ 91,480**	**$ 88,853**	**$ (661,410)**	**$ (80,451)**	**$ 669,137**	**$ 209,859**
Total Pension Liability - Beginning	**$ 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**
Total Pension Liability - Ending (a)	**$ 2,264,140**	**$ 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**
Plan Fiduciary Net Position										
Employer Contributions	$ 72,778	$ 58,521	$ 55,104	$ 48,823	$ 43,658	$ 38,245	$ 32,893	$ 31,763	$ 30,678	$ 29,480
Employee Contributions	31,777	29,843	28,270	27,136	26,734	25,686	23,417	22,648	21,953	21,061
Pension Plan Net Investment Income	195,785	130,514	(99,155)	366,352	49,608	80,942	105,263	135,359	(195)	38,624
Benefit Payments	(99,438)	(92,863)	(87,102)	(81,829)	(77,045)	(72,419)	(67,622)	(63,221)	(59,045)	(54,909)
Refunds	(2,809)	(3,345)	(3,240)	(2,136)	(2,488)	(2,484)	(2,052)	(1,466)	(1,895)	(1,590)
Pension Plan Administrative Expense	(1,100)	(970)	(909)	(950)	(924)	(856)	(827)	(856)	(906)	(720)
Other Changes	(21)	9	-	20	(1)	(6)	(2)	(2)	-	-
Net Change in Plan Fiduciary Net Position	**$ 196,972**	**$ 121,709**	**$ (107,032)**	**$ 357,416**	**$ 39,542**	**$ 69,108**	**$ 91,070**	**$ 124,225**	**$ (9,410)**	**$ 31,946**
Plan Fiduciary Net Position - Beginning	**$ 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**
Plan Fiduciary Net Position - Ending (b)	**$ 1,792,602**	**$ 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**
Net Pension Liability - Ending (a) - (b)	**$ 471,538**	**$ 538,462**	**$ 599,691**	**$ 442,087**	**$ 447,317**	**$ 395,379**	**$ 375,634**	**$ 1,128,114**	**$ 1,332,790**	**$ 654,243**
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**79.17 %**	**74.77 %**	**71.08 %**	**78.15 %**	**73.23 %**	**74.97 %**	**74.80 %**	**47.58 %**	**40.30 %**	**58.15 %**
Covered-Employee Payroll [1]	**$ 331,010**	**$ 310,865**	**$ 294,479**	**$ 282,667**	**$278,479**	**$267,563**	**$257,330**	**$248,879**	**$241,242**	**$231,440**
Net Pension Liability as a Percentage of Covered-Employee Payroll	**142.45 %**	**173.21 %**	**203.64 %**	**156.40 %**	**160.63 %**	**147.77 %**	**145.97 %**	**453.28 %**	**552.47 %**	**282.68 %**

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)
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
2024	2,264,140	1,792,602	471,538	79.17	331,010	142.45

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)
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
2024	61,369	72,778	(11,409)	331,010	21.99

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Fiscal Year Ending June 30, 2024 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, 2023
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	25 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	7.00%
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, 2023 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-2023

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2014	4.4 %
2015	0.0
2016	15.2
2017	10.4
2018	7.3
2019	4.2
2020	30.2
2021	(6.3)
2022	8.9
2024	12.4

[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, 2024, the annual money-weighted rate of return for the Correctional Employees Retirement Fund was 12.4%. 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 100, 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, 2024, 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	$ 2,598,954	$ 2,264,140	$ 1,992,292
Net Position Restricted for Pensions	1,792,602	1,792,602	1,792,602
Net Pension Liability	**$ 806,352**	**$ 471,538**	**$ 199,690**

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	**$ 2,134,092**	**$ 1,595,630**	**$ 538,462**	**$ 276,737**	**$ 227,623**	
Changes for the Year:						
Service Cost	$ 56,528		$ 56,528			$ 56,528
Interest on Total Pension Liability	147,786		147,786			147,786
Interest on Plan Fiduciary Net Position [1]		$ 111,736 [1]	(111,736)			(111,736)
Changes in Benefit Terms	-		-			-
Liability Experience Gains and Losses	27,981		27,981	$ 20,986	$ -	6,995
Changes in Assumptions	-		-	-	-	-
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(16,530)	(947)	15,583
Assumption Changes				(53,913)	(36,247)	17,666
Investment Gains/(Losses)				(48,094)	(61,249)	(13,155)
Contributions - Employer		72,778	(72,778)			
Contributions - Employees		31,777	(31,777)			(31,777)
Asset Gain/(Loss) [1]		84,049 [1]	(84,049)	-	67,239	(16,810)
Benefit Payment and Refunds	(102,247)	(102,247)				
Administrative Expenses		(1,100)	1,100			1,100
Other Changes		(21)	21			21
Net Changes	**$ 130,048**	**$ 196,972**	**$ (66,924)**	**$ (97,551)**	**$ (31,204)**	**$ 72,201**
Balance End of Year	**$ 2,264,140**	**$ 1,792,602**	**$ 471,538**	**$ 179,186**	**$ 196,419**	

[1] *The sum of these items in column (b) equals the net investment income of $195,785.*

Summary of Population Statistics

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2023	**4,426**	**1,544**	**1,309**	**3,448**	**335**	**306**	**11,368**
New members	695						**695**
Return to active	39	(13)	(26)	0	0	0	**0**
Terminated non-vested	(282)	0	282	0	0	0	**0**
Service retirements	(125)	(36)	0	161	0	0	**0**
Terminated deferred	(158)	158	0	0	0	0	**0**
Terminated refund/transfer	(103)	(12)	(131)	0	0	0	**(246)**
Deaths	(8)	(3)	(1)	(47)	(7)	(2)	**(68)**
New beneficiary	0	0	0	0	0	22	**22**
Disabled	(8)	0	0	0	8	0	**0**
Unexpected status changes	0	11	84	12	2	0	**109**
Net change	50	105	208	126	3	20	**512**
Members on 6/30/2024	**4,476**	**1,649**	**1,517**	**3,574**	**338**	**326**	**11,880**

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:
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.

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).

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.

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)	
Duty Disability (Continued)	
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.
Regular Disability	
Age/Service requirement	At least one year of covered Correctional service for employees hired before July 1, 2009, or a vested Correctional employee hired after June 30, 2009, and the employee is determined to have a regular disability not related to an incident while performing the duties of the job.
Amount	Normal retirement benefit based on covered Correctional Service (minimum of 15 years if hired prior to July 1, 2009) and Average Salary at disability. Payment begins at disability and ends at age 55 (age 65 if disabled prior to July 1, 2009) or the five-year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. Member is reclassified from disabled to retired at age 55 (age 65 if disabled prior to July 1, 2009). Optional amount continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option.
Benefit Increases	Same as for retirement.
Death	
Surviving spouse benefit	
Age/Service requirement	Member at any age or former member age 50 or older who dies before retirement or disability benefit commences and was vested. If a former member dies before age 55 and has less than 30 years of Allowable Service, benefits commence when the former member would have been age 55. If an active member dies, benefits may commence immediately, regardless of age.

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 (Concluded)

Termination (Continued)	
Deferred benefit	
Age/service requirement	Partially or fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971, to January 1, 1981; (c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1 of the year following attainment of age 55 or January 1, 2012, whichever is earlier; (d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012; (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.
Changes in plan provisions	There were no changes in plan provisions since the prior valuation.

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. An experience study for the 2019-2023 period was issued on July 16, 2024. This report recommended changes to demographic assumptions, expected to be effective at a future date.

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.
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 13 members reported with zero or invalid salary. We used prior year salary (8 members), if available, otherwise, high five salary with a 10% load to account for salary increases (4 members). If neither pay or high five salary was available, we assumed a value of $45,000 (1 member). 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 78 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 33 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 (10 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 8 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 were 2 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the "pop-up," if any. There were 26 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 (358 members) and/or survivor date of birth (302 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	There were no changes in actuarial assumptions since the prior valuation.

Summary of Actuarial Assumptions (Continued)

Age in 2024	Percentage of Members Dying Each Year* Healthy Post-Retirement Mortality** Male	Female	Healthy Pre-Retirement Mortality** Male	Female	Disability Mortality** 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	0.86	0.76
45	0.12	0.07	0.10	0.06	1.07	0.99
50	0.28	0.21	0.14	0.08	1.51	1.41
55	0.41	0.29	0.21	0.13	2.02	1.78
60	0.63	0.40	0.32	0.20	2.55	2.05
65	0.91	0.59	0.47	0.28	3.03	2.17
70	1.41	0.95	0.65	0.43	3.60	2.54
75	2.37	1.66	0.97	0.71	4.61	3.54
80	4.25	3.06	1.54	1.21	6.53	5.47
85	7.77	5.78	6.53	4.97	9.78	8.69
90	13.48	10.78	13.48	10.78	14.93	12.83

* *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.*

Age	Percent of Members Decrementing Each Year Disability Retirement 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)

Age	Percent Retiring		Salary Scale Year	Salary Scale Increase		Percent of Members Terminating (Withdrawing) Each Year: 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 3.97% (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, 2024 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)
2024	$ 331,010		$ 331,010				
2025	333,196	$ 11,615	344,811	$ 31,987	$ 62,807	$ 1,233	$ 96,027
2026	313,150	42,005	355,155	30,062	59,029	4,461	93,552
2027	294,419	71,391	365,810	28,264	55,498	7,582	91,344
2028	278,552	98,232	376,784	26,741	52,507	10,432	89,680
2029	264,647	123,441	388,088	25,406	49,886	13,109	88,401
2030	251,365	148,365	399,730	24,131	47,382	15,756	87,269
2031	238,928	172,794	411,722	22,937	45,038	18,351	86,326
2032	227,234	196,840	424,074	21,814	42,834	20,904	85,552
2033	215,971	220,825	436,796	20,733	40,710	23,452	84,895
2034	205,005	244,895	449,900	19,681	38,643	26,008	84,332
2035	194,065	269,332	463,397	18,630	36,581	28,603	83,814
2036	182,906	294,393	477,299	17,559	34,478	31,265	83,302
2037	171,486	320,132	491,618	16,463	32,325	33,998	82,786
2038	159,948	346,418	506,366	15,355	30,150	36,790	82,295
2039	148,842	372,715	521,557	14,289	28,057	39,582	81,928
2040	137,989	399,215	537,204	13,247	26,011	42,397	81,655
2041	127,110	426,210	553,320	12,203	23,960	45,264	81,427
2042	116,702	453,218	569,920	11,203	21,998	48,132	81,333
2043	107,086	479,931	587,017	10,280	20,186	50,969	81,435
2044	98,252	506,376	604,628	9,432	18,521	53,777	81,730
2045	89,688	533,079	622,767	8,610	12,915	32,891	54,416
2046	81,200	560,250	641,450	7,795	11,693	34,567	54,055
2047	73,163	587,530	660,693	7,024	10,536	36,251	53,811
2048	65,745	614,769	680,514	6,312	9,467	37,931	53,710
2049	58,916	642,013	700,929	5,656	8,484	39,612	53,752
2050	52,364	669,593	721,957	5,027	7,540	41,314	53,881
2051	45,858	697,758	743,616	4,402	6,603	43,052	54,057
2052	39,835	726,089	765,924	3,824	5,736	44,800	54,360
2053	34,193	754,709	788,902	3,282	4,924	46,566	54,772
2054	28,708	783,861	812,569	2,756	4,134	48,364	55,254
2055	23,777	813,169	836,946	2,283	3,424	50,173	55,880
2056	19,515	842,540	862,055	1,873	2,810	51,985	56,668
2057	15,675	872,241	887,916	1,505	2,257	53,817	57,579
2058	12,360	902,194	914,554	1,187	1,780	55,665	58,632
2059	9,713	932,277	941,990	932	1,399	57,522	59,853
2060	7,509	962,741	970,250	721	1,081	59,401	61,203
2061	5,773	993,585	999,358	554	831	61,304	62,689
2062	4,506	1,024,832	1,029,338	433	649	63,232	64,314
2063	3,508	1,056,710	1,060,218	337	505	65,199	66,041
2064	2,682	1,089,343	1,092,025	257	386	67,212	67,855
2065	2,002	1,122,784	1,124,786	192	288	69,276	69,756
2066	1,461	1,157,068	1,158,529	140	210	71,391	71,741
2067	1,043	1,192,242	1,193,285	100	150	73,561	73,811
2068	722	1,228,362	1,229,084	69	104	75,790	75,963
2069	485	1,265,471	1,265,956	47	70	78,080	78,197
2070	316	1,303,619	1,303,935	30	45	80,433	80,508
2071	197	1,342,856	1,343,053	19	28	82,854	82,901
2072	113	1,383,232	1,383,345	11	16	85,345	85,372
2073	58	1,424,787	1,424,845	6	8	87,909	87,923
2074	27	1,467,563	1,467,590	3	4	90,549	90,556

1. *Equal to total contributions (28.45% of payroll for 20 years and 24.00% of payroll thereafter for new employee payroll) net of new employee normal cost and expenses (17.83% of pay).*
2. *Ultimate contribution rate; projected 2024 through 2044 employer contributions are based on a 18.85% of pay contribution.*

Totals may not add due to rounding.

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)
2075	$ 8	$ 1,511,610	$ 1,511,618	$ 1	$ 1	$ 93,266	$ 93,268
2076	-	1,556,967	1,556,967	-	-	96,065	96,065
2077	-	1,603,676	1,603,676	-	-	98,947	98,947
2078	-	1,651,786	1,651,786	-	-	101,915	101,915
2079	-	1,701,339	1,701,339	-	-	104,973	104,973
2080	-	1,752,380	1,752,380	-	-	108,122	108,122
2081	-	1,804,951	1,804,951	-	-	111,365	111,365
2082	-	1,859,100	1,859,100	-	-	114,706	114,706
2083	-	1,914,873	1,914,873	-	-	118,148	118,148
2084	-	1,972,319	1,972,319	-	-	121,692	121,692
2085	-	2,031,488	2,031,488	-	-	125,343	125,343
2086	-	2,092,433	2,092,433	-	-	129,103	129,103
2087	-	2,155,206	2,155,206	-	-	132,976	132,976
2088	-	2,219,862	2,219,862	-	-	136,965	136,965
2089	-	2,286,458	2,286,458	-	-	141,074	141,074
2090	-	2,355,052	2,355,052	-	-	145,307	145,307
2091	-	2,425,703	2,425,703	-	-	149,666	149,666
2092	-	2,498,474	2,498,474	-	-	154,156	154,156
2093	-	2,573,429	2,573,429	-	-	158,781	158,781
2094	-	2,650,631	2,650,631	-	-	163,544	163,544
2095	-	2,730,150	2,730,150	-	-	168,450	168,450
2096	-	2,812,055	2,812,055	-	-	173,504	173,504
2097	-	2,896,417	2,896,417	-	-	178,709	178,709
2098	-	2,983,309	2,983,309	-	-	184,070	184,070
2099	-	3,072,808	3,072,808	-	-	189,592	189,592
2100	-	3,164,993	3,164,993	-	-	195,280	195,280
2101	-	3,259,942	3,259,942	-	-	201,138	201,138
2102	-	3,357,741	3,357,741	-	-	207,173	207,173
2103	-	3,458,473	3,458,473	-	-	213,388	213,388
2104	-	3,562,227	3,562,227	-	-	219,789	219,789
2105	-	3,669,094	3,669,094	-	-	226,383	226,383
2106	-	3,779,167	3,779,167	-	-	233,175	233,175
2107	-	3,892,542	3,892,542	-	-	240,170	240,170
2108	-	4,009,318	4,009,318	-	-	247,375	247,375
2109	-	4,129,597	4,129,597	-	-	254,796	254,796
2110	-	4,253,485	4,253,485	-	-	262,440	262,440
2111	-	4,381,090	4,381,090	-	-	270,313	270,313
2112	-	4,512,523	4,512,523	-	-	278,423	278,423
2113	-	4,647,898	4,647,898	-	-	286,775	286,775
2114	-	4,787,335	4,787,335	-	-	295,379	295,379
2115	-	4,930,955	4,930,955	-	-	304,240	304,240
2116	-	5,078,884	5,078,884	-	-	313,367	313,367
2117	-	5,231,250	5,231,250	-	-	322,768	322,768
2118	-	5,388,188	5,388,188	-	-	332,451	332,451
2119	-	5,549,834	5,549,834	-	-	342,425	342,425
2120	-	5,716,329	5,716,329	-	-	352,697	352,697
2121	-	5,887,818	5,887,818	-	-	363,278	363,278
2122	-	6,064,453	6,064,453	-	-	374,177	374,177
2123	-	6,246,387	6,246,387	-	-	385,402	385,402
2124	-	6,433,778	6,433,778	-	-	396,964	396,964

1. *Equal to total contributions (28.45% of payroll for 20 years and 24.00% of payroll thereafter for new employee payroll) net of new employee normal cost and expenses (17.83% of pay).*
2. *Ultimate contribution rate; projected 2024 through 2044 employer contributions are based on a 18.85% of pay contribution.*

Totals may not add due to rounding.

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)
2025	$ 1,792,602	$ 96,027	$ 109,854	$ 1,133	$ 124,967	$ 1,902,610
2026	1,902,610	93,552	115,379	1,065	132,395	2,012,113
2027	2,012,113	91,344	120,934	1,001	139,795	2,121,318
2028	2,121,318	89,680	126,137	947	147,205	2,231,119
2029	2,231,119	88,401	131,043	900	154,680	2,342,258
2030	2,342,258	87,269	137,117	855	162,214	2,453,769
2031	2,453,769	86,326	144,111	812	169,748	2,564,919
2032	2,564,919	85,552	151,022	773	177,265	2,675,943
2033	2,675,943	84,895	158,426	734	184,761	2,786,439
2034	2,786,439	84,332	166,219	697	192,209	2,896,064
2035	2,896,064	83,814	174,522	660	199,581	3,004,277
2036	3,004,277	83,302	183,453	622	206,832	3,110,335
2037	3,110,335	82,786	193,073	583	213,909	3,213,373
2038	3,213,373	82,295	202,590	544	220,778	3,313,313
2039	3,313,313	81,928	211,623	506	227,452	3,410,563
2040	3,410,563	81,655	220,682	469	233,940	3,505,006
2041	3,505,006	81,427	229,670	432	240,235	3,596,565
2042	3,596,565	81,333	238,042	397	246,354	3,685,814
2043	3,685,814	81,435	245,597	364	252,346	3,773,634
2044	3,773,634	81,730	252,404	334	258,270	3,860,896
2045	3,860,896	54,416	258,684	305	263,224	3,919,547
2046	3,919,547	54,055	264,840	276	267,106	3,975,592
2047	3,975,592	53,811	270,572	249	270,825	4,029,406
2048	4,029,406	53,710	275,557	224	274,417	4,081,753
2049	4,081,753	53,752	279,811	200	277,938	4,133,431
2050	4,133,431	53,881	283,737	178	281,425	4,184,823
2051	4,184,823	54,057	287,329	156	284,906	4,236,301
2052	4,236,301	54,360	290,198	135	288,422	4,288,750
2053	4,288,750	54,772	292,497	116	292,029	4,342,937
2054	4,342,937	55,254	294,510	98	295,770	4,399,354
2055	4,399,354	55,880	295,751	81	299,698	4,459,100
2056	4,459,100	56,668	296,125	66	303,895	4,523,472
2057	4,523,472	57,579	295,914	53	308,441	4,593,525
2058	4,593,525	58,632	294,944	42	313,414	4,670,585
2059	4,670,585	59,853	293,087	33	318,915	4,756,232
2060	4,756,232	61,203	290,575	26	325,043	4,851,878
2061	4,851,878	62,689	287,339	20	331,901	4,959,110
2062	4,959,110	64,314	283,407	15	339,599	5,079,600
2063	5,079,600	66,041	278,972	12	348,245	5,214,903
2064	5,214,903	67,855	274,102	9	357,946	5,366,594
2065	5,366,594	69,756	268,817	7	368,812	5,536,338
2066	5,536,338	71,741	263,112	5	380,959	5,725,922
2067	5,725,922	73,811	257,000	4	394,511	5,937,241
2068	5,937,241	75,963	250,498	2	409,601	6,172,306
2069	6,172,306	78,197	243,619	2	426,369	6,433,251
2070	6,433,251	80,508	236,379	1	444,964	6,722,345
2071	6,722,345	82,901	228,802	1	465,544	7,041,988
2072	7,041,988	85,372	220,915	-	488,275	7,394,720
2073	7,394,720	87,923	212,742	-	513,336	7,783,237
2074	7,783,237	90,556	204,310	-	540,912	8,210,394

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

Totals may not add due to rounding.

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)
2075	$ 8,210,394	$ 93,266	$ 195,659	$ -	$ 571,205	$ 8,679,208
2076	8,679,208	96,065	186,820	-	604,422	9,192,874
2077	9,192,874	98,947	177,834	-	640,787	9,754,773
2078	9,754,773	101,915	168,746	-	680,535	10,368,477
2079	10,368,477	104,973	159,596	-	723,914	11,037,768
2080	11,037,768	108,122	150,427	-	771,188	11,766,650
2081	11,766,650	111,365	141,285	-	822,636	12,559,367
2082	12,559,367	114,706	132,215	-	878,553	13,420,412
2083	13,420,412	118,148	123,264	-	939,253	14,354,548
2084	14,354,548	121,692	114,476	-	1,005,067	15,366,831
2085	15,366,831	125,343	105,896	-	1,076,347	16,462,625
2086	16,462,625	129,103	97,562	-	1,153,469	17,647,635
2087	17,647,635	132,976	89,511	-	1,236,830	18,927,930
2088	18,927,930	136,965	81,771	-	1,326,854	20,309,978
2089	20,309,978	141,074	74,366	-	1,423,994	21,800,680
2090	21,800,680	145,307	67,314	-	1,528,731	23,407,404
2091	23,407,404	149,666	60,629	-	1,641,582	25,138,023
2092	25,138,023	154,156	54,320	-	1,763,097	27,000,956
2093	27,000,956	158,781	48,392	-	1,893,865	29,005,210
2094	29,005,210	163,544	42,847	-	2,034,518	31,160,425
2095	31,160,425	168,450	37,686	-	2,185,729	33,476,918
2096	33,476,918	173,504	32,905	-	2,348,222	35,965,739
2097	35,965,739	178,709	28,502	-	2,522,770	38,638,716
2098	38,638,716	184,070	24,471	-	2,710,202	41,508,517
2099	41,508,517	189,592	20,809	-	2,911,404	44,588,704
2100	44,588,704	195,280	17,507	-	3,127,326	47,893,803
2101	47,893,803	201,138	14,558	-	3,358,986	51,439,370
2102	51,439,370	207,173	11,953	-	3,607,473	55,242,063
2103	55,242,063	213,388	9,679	-	3,873,954	59,319,725
2104	59,319,725	219,789	7,720	-	4,159,678	63,691,472
2105	63,691,472	226,383	6,060	-	4,465,984	68,377,779
2106	68,377,779	233,175	4,674	-	4,794,307	73,400,587
2107	73,400,587	240,170	3,539	-	5,146,183	78,783,401
2108	78,783,401	247,375	2,627	-	5,523,259	84,551,408
2109	84,551,408	254,796	1,909	-	5,927,300	90,731,595
2110	90,731,595	262,440	1,357	-	6,360,195	97,352,873
2111	97,352,873	270,313	942	-	6,823,970	104,446,214
2112	104,446,214	278,423	637	-	7,320,793	112,044,793
2113	112,044,793	286,775	420	-	7,852,988	120,184,136
2114	120,184,136	295,379	270	-	8,423,044	128,902,288
2115	128,902,288	304,240	168	-	9,033,623	138,239,983
2116	138,239,983	313,367	102	-	9,687,578	148,240,826
2117	148,240,826	322,768	60	-	10,387,962	158,951,495
2118	158,951,495	332,451	34	-	11,138,042	170,421,955
2119	170,421,955	342,425	19	-	11,941,318	182,705,679
2120	182,705,679	352,697	10	-	12,801,533	195,859,899
2121	195,859,899	363,278	5	-	13,722,692	209,945,865
2122	209,945,865	374,177	3	-	14,709,085	225,029,124
2123	225,029,124	385,402	1	-	15,765,300	241,179,824
2124	241,179,824	396,964	1	-	16,896,246	258,473,034

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

Totals may not add due to rounding.

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)
2025	$ 1,792,602	$ 109,854	$ 109,854	$ -	$ 106,200	$ -	$ 106,200
2026	1,902,610	115,379	115,379	-	104,244	-	104,244
2027	2,012,113	120,934	120,934	-	102,115	-	102,115
2028	2,121,318	126,137	126,137	-	99,540	-	99,540
2029	2,231,119	131,043	131,043	-	96,647	-	96,647
2030	2,342,258	137,117	137,117	-	94,511	-	94,511
2031	2,453,769	144,111	144,111	-	92,833	-	92,833
2032	2,564,919	151,022	151,022	-	90,920	-	90,920
2033	2,675,943	158,426	158,426	-	89,138	-	89,138
2034	2,786,439	166,219	166,219	-	87,405	-	87,405
2035	2,896,064	174,522	174,522	-	85,767	-	85,767
2036	3,004,277	183,453	183,453	-	84,258	-	84,258
2037	3,110,335	193,073	193,073	-	82,875	-	82,875
2038	3,213,373	202,590	202,590	-	81,271	-	81,271
2039	3,313,313	211,623	211,623	-	79,341	-	79,341
2040	3,410,563	220,682	220,682	-	77,325	-	77,325
2041	3,505,006	229,670	229,670	-	75,209	-	75,209
2042	3,596,565	238,042	238,042	-	72,851	-	72,851
2043	3,685,814	245,597	245,597	-	70,246	-	70,246
2044	3,773,634	252,404	252,404	-	67,470	-	67,470
2045	3,860,896	258,684	258,684	-	64,625	-	64,625
2046	3,919,547	264,840	264,840	-	61,835	-	61,835
2047	3,975,592	270,572	270,572	-	59,040	-	59,040
2048	4,029,406	275,557	275,557	-	56,194	-	56,194
2049	4,081,753	279,811	279,811	-	53,329	-	53,329
2050	4,133,431	283,737	283,737	-	50,539	-	50,539
2051	4,184,823	287,329	287,329	-	47,831	-	47,831
2052	4,236,301	290,198	290,198	-	45,148	-	45,148
2053	4,288,750	292,497	292,497	-	42,529	-	42,529
2054	4,342,937	294,510	294,510	-	40,020	-	40,020
2055	4,399,354	295,751	295,751	-	37,560	-	37,560
2056	4,459,100	296,125	296,125	-	35,147	-	35,147
2057	4,523,472	295,914	295,914	-	32,824	-	32,824
2058	4,593,525	294,944	294,944	-	30,576	-	30,576
2059	4,670,585	293,087	293,087	-	28,396	-	28,396
2060	4,756,232	290,575	290,575	-	26,311	-	26,311
2061	4,851,878	287,339	287,339	-	24,316	-	24,316
2062	4,959,110	283,407	283,407	-	22,414	-	22,414
2063	5,079,600	278,972	278,972	-	20,620	-	20,620
2064	5,214,903	274,102	274,102	-	18,934	-	18,934
2065	5,366,594	268,817	268,817	-	17,355	-	17,355
2066	5,536,338	263,112	263,112	-	15,875	-	15,875
2067	5,725,922	257,000	257,000	-	14,492	-	14,492
2068	5,937,241	250,498	250,498	-	13,201	-	13,201
2069	6,172,306	243,619	243,619	-	11,999	-	11,999
2070	6,433,251	236,379	236,379	-	10,880	-	10,880
2071	6,722,345	228,802	228,802	-	9,843	-	9,843
2072	7,041,988	220,915	220,915	-	8,882	-	8,882
2073	7,394,720	212,742	212,742	-	7,994	-	7,994
2074	7,783,237	204,310	204,310	-	7,175	-	7,175

Totals may not add due to rounding.

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)
2075	$ 8,210,394	$ 195,659	$ 195,659	$ -	$ 6,421	$ -	$ 6,421
2076	8,679,208	186,820	186,820	-	5,730	-	5,730
2077	9,192,874	177,834	177,834	-	5,098	-	5,098
2078	9,754,773	168,746	168,746	-	4,521	-	4,521
2079	10,368,477	159,596	159,596	-	3,996	-	3,996
2080	11,037,768	150,427	150,427	-	3,520	-	3,520
2081	11,766,650	141,285	141,285	-	3,090	-	3,090
2082	12,559,367	132,215	132,215	-	2,702	-	2,702
2083	13,420,412	123,264	123,264	-	2,354	-	2,354
2084	14,354,548	114,476	114,476	-	2,044	-	2,044
2085	15,366,831	105,896	105,896	-	1,767	-	1,767
2086	16,462,625	97,562	97,562	-	1,521	-	1,521
2087	17,647,635	89,511	89,511	-	1,304	-	1,304
2088	18,927,930	81,771	81,771	-	1,114	-	1,114
2089	20,309,978	74,366	74,366	-	947	-	947
2090	21,800,680	67,314	67,314	-	801	-	801
2091	23,407,404	60,629	60,629	-	674	-	674
2092	25,138,023	54,320	54,320	-	564	-	564
2093	27,000,956	48,392	48,392	-	470	-	470
2094	29,005,210	42,847	42,847	-	389	-	389
2095	31,160,425	37,686	37,686	-	320	-	320
2096	33,476,918	32,905	32,905	-	261	-	261
2097	35,965,739	28,502	28,502	-	211	-	211
2098	38,638,716	24,471	24,471	-	169	-	169
2099	41,508,517	20,809	20,809	-	135	-	135
2100	44,588,704	17,507	17,507	-	106	-	106
2101	47,893,803	14,558	14,558	-	82	-	82
2102	51,439,370	11,953	11,953	-	63	-	63
2103	55,242,063	9,679	9,679	-	48	-	48
2104	59,319,725	7,720	7,720	-	36	-	36
2105	63,691,472	6,060	6,060	-	26	-	26
2106	68,377,779	4,674	4,674	-	19	-	19
2107	73,400,587	3,539	3,539	-	13	-	13
2108	78,783,401	2,627	2,627	-	9	-	9
2109	84,551,408	1,909	1,909	-	6	-	6
2110	90,731,595	1,357	1,357	-	4	-	4
2111	97,352,873	942	942	-	3	-	3
2112	104,446,214	637	637	-	2	-	2
2113	112,044,793	420	420	-	1	-	1
2114	120,184,136	270	270	-	1	-	1
2115	128,902,288	168	168	-	-	-	-
2116	138,239,983	102	102	-	-	-	-
2117	148,240,826	60	60	-	-	-	-
2118	158,951,495	34	34	-	-	-	-
2119	170,421,955	19	19	-	-	-	-
2120	182,705,679	10	10	-	-	-	-
2121	195,859,899	5	5	-	-	-	-
2122	209,945,865	3	3	-	-	-	-
2123	225,029,124	1	1	-	-	-	-
2124	241,179,824	1	1	-	-	-	-
				Totals	$ 2,706,590	$ -	$ 2,706,590

Totals may not add due to rounding.

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.