Minnesota State Retirement System

State Employees Retirement Fund

GASB Statement Nos. 67 and 68

Accounting and Financial Reporting for Pensions

June 30, 2022

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November 18, 2022

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

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the State Employees Retirement Fund, as amended by GASB Statement No. 82. These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust. 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 financial 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. Minnesota State Retirement System (MSRS) is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the 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, 2022 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

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To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the State Employees Retirement Fund as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

This report reflects the impact of COVID-19 through June 30, 2022. It does not reflect the ongoing impact of COVID-19, which is likely to influence demographic and investment experience, at least in the short term. We will continue to monitor these developments and their impact on the plan.

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.

Brian B. Murphy, Bonita J. Wurst, and Sheryl L. 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

Brian B. Murphy

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

Bonita J. Wurst

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

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BBM/BJW:rl

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SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2022 (Dollars in Thousands)

	2022
Actuarial Valuation Date	June 30, 2022
Measurement Date of the Net Pension Liability	June 30, 2022
Membership	
Number of	
- Service Retirements	40,610
- Survivors	4,505
- Disability Retirements	1,731
- Deferred Retirements	17,822
- Terminated Other Non-Vested	10,668
- Active Members	51,219
- Total	126,555
Covered-employee Payroll	$ 3,434,267 [1]
Net Pension Liability	
Total Pension Liability	$ 17,473,133
Plan Fiduciary Net Position	15,829,850
Net Pension Liability	$ 1,643,283
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	90.60%
Net Pension Liability as a Percentage of Covered-employee Payroll	47.85%
Development of the Single Discount Rate	
Single Discount Rate	6.75%
Long-Term Expected Rate of Investment Return	6.75%
Long-Term Municipal Bond Rate	3.69% [2]
Last year ending June 30 in the 2023 to 2122 projection period for which projected benefit payments are fully funded	2122
Total Pension Expense/ (Income)	$ (700,638)

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

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of the Total Pension Liability	$ 12,816	$ 10,546
Changes in assumptions	1,125,107	597,497
Net difference between projected and actual earnings on pension plan investments	1,925,235	1,846,931
Totals	$ 3,063,158	$ 2,454,974

[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 State Employees Retirement Fund subsequent to the measurement date of June 30, 2022.

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

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

Notes to Financial Statements

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

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

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

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

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

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the State Employees Retirement Fund, can be found online at www.msrs.state.mn.us/annual-reports-fy-2022 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 7.5% 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 percentage of payroll;
2. The funded status of the plan is expected to gradually improve and is expected to be 100% funded within the next 26 years; and
3. The unfunded liability will grow initially as a dollar amount before beginning to decline.

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

Limitations of Funded Status Measurements

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

1. The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
2. The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
3. The measurement would produce a different result if the actuarial value of assets were used instead of the market value of assets.

Limitation of Project Scope

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

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. For employer reporting, the net pension liability and pension expense should be measured as of a date (measurement date) no earlier than the end of the employer's prior fiscal year, consistently applied from period to period. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2022 and a measurement date of June 30, 2022.

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 expected rate of return on pension plan investments is 6.75%; the municipal bond rate is 3.69% (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 6.75%. The MSRS Board selected the long-term expected rate of investment return of 6.75% based on input from GRS that the proposed selection would be reasonable for the purpose of the measurement.

SECTION B

FINANCIAL STATEMENTS

Statement of Pension Expense Under GASB Statement No. 68
Fiscal Year Ended June 30, 2022 (Dollars in Thousands)

A. Expense/(Income)		
1. Service Cost	$	340,333
2. Interest on the Total Pension Liability		1,117,920
3. Current-Period Benefit Changes		-
4. Employee Contributions		(206,056)
5. Projected Earnings on Plan Investments		(1,115,739)
6. Pension Plan Administrative Expense		10,483
7. Other Changes in Plan Fiduciary Net Position		(27,945)
8. Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
Arising from Current Reporting Period		(1,339)
9. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Current Reporting Period		(102,813)
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		435,255
11. Increases/(Decreases) from Experience in the Current Reporting Period	**$**	**450,099**
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	$	3,139
13. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Prior Reporting Periods		(561,900)
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		(591,976)
15. Total Pension Expense/ (Income)	**$**	**(700,638)**

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 580,529 years. Additionally, the total plan membership (active employees and inactive employees) was 123,198. 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 5.0000 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, 2022 (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	$ (6,694)
2. Assumption Changes (gains) or losses	(514,065)
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years, rounded to the nearest whole number}	5
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience in the measurement of the Total Pension Liability	(1,339)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	(102,813)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$ (104,152)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$ (5,355)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	(411,252)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$ (416,607)
B. Outflows (Inflows) of Resources due to Assets	
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$ 2,176,276
2. Recognition period for Assets {in years}	5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	435,255
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$ 1,741,021

Statement of Outflows and Inflows
Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30, 2022 (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	$ 382,398	$ 1,045,311	$ (662,913)
2. Due to Assets	530,465	687,186	(156,721)
3. Total	$ 912,863	$ 1,732,497	$ (819,634)

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	$ 7,362	$ 5,562	$ 1,800
2. Assumption Changes	375,036	1,039,749	(664,713)
3. Net Difference between projected and actual earnings on pension plan investments	530,465	687,186	(156,721)
4. Total	$ 912,863	$ 1,732,497	$ (819,634)

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	$ 12,816	$ 10,546	$ 2,270
2. Assumption Changes	1,125,107	597,497	527,610
3. Net Difference between projected and actual earnings on pension plan investments*	1,925,235	1,846,931	78,304
4. Total	$ 3,063,158	$ 2,454,974	$ 608,184

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
2023	$ 97,349
2024	86,508
2025	93,222
2026	331,105
2027	-
Thereafter	-
Total	$ 608,184

** 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, 2022 (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					
2018	$ (8,132)	5.0000	$ (1,627)	$ 0	0.0000
2019	23,180	5.0000	4,636	4,636	1.0000
2020	(12,979)	5.0000	(2,596)	(5,191)	2.0000
2021	13,632	5.0000	2,726	8,180	3.0000
2022	(6,694)	5.0000	(1,339)	(5,355)	4.0000
Total			**$ 1,800**	**$ 2,270**	
Deferred Outflow (Inflow) Due to Assumption Changes					
2018	$ (4,219,074)	5.0000	$ (843,814)	$ 0	0.0000
2020	(465,611)	5.0000	(93,122)	(186,245)	2.0000
2021	1,875,179	5.0000	375,036	1,125,107	3.0000
2022	(514,065)	5.0000	(102,813)	(411,252)	4.0000
Total			**$ (664,713)**	**$ 527,610**	
Deferred Outflow (Inflow) Due to Differences Between Projected and Actual Earnings on Plan Investments					
2018	$ (357,707)	5.0000	$ (71,542)	$ 0	0.0000
2019	31,034	5.0000	6,207	6,206	1.0000
2020	445,017	5.0000	89,003	178,008	2.0000
2021	(3,078,219)	5.0000	(615,644)	(1,846,931)	3.0000
2022	2,176,276	5.0000	435,255	1,741,021	4.0000
Total			**$ (156,721)**	**$ 78,304**	
Deferred Outflow (Inflow) Due to All Sources					
Total			**$ (819,634)**	**$ 608,184**	

Statement of Fiduciary Net Position
as of June 30, 2022 (Dollars in Thousands)

Assets		**June 30, 2022**
Cash & Short-term Investments	$	290,453
Receivables		40,844
Investment Pools (at fair value)		15,495,466
Securities Lending Collateral		816,794
Capital Assets		12,332
Total Assets	**$**	**16,655,889**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(826,039)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**15,829,850**

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2022 (Dollars in Thousands)

1.	**Net position at market value at beginning of year**	**$ 17,440,051**
Additions		
2.	Contributions	
	a. Employee	$ 206,056
	b. Employer	212,759
	c. Other sources	-
	d. Total contributions	$ 418,815
3.	Investment income	
	a. Investment income/(loss)	$ (1,042,193)
	b. Investment expenses	(18,344)
	c. Net investment income/(loss)	$ (1,060,537)
4.	Other Additions	27,988
5.	**Total Additions (2.d.) + (3.c.) + (4.)**	**$ (613,734)**
Deductions		
6.	Benefits Paid	
	a. Annuity benefits	$ (966,698)
	b. Refunds	(19,243)
	c. Total benefits paid	$ (985,941)
7.	Expenses	
	a. Other deductions	$ (43)
	b. Administrative	(10,483)
	c. Total expenses	$ (10,526)
8.	**Total deductions (6.c.) + (7.c.)**	**$ (996,467)**
9.	**Net increase/(decrease) in fiduciary net position (5.) + (8.)**	**$ (1,610,201)**
10.	**Net position at market value at end of year (1.) + (9.)**	**$ 15,829,850**
11.	State Board of Investment calculated annual investment return for the State Employees Retirement Fund*	-6.2%

** The fiscal year 2022 investment return for the Combined Funds is -6.4%.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2022 (Dollars in Thousands)

A. Total pension liability		
1. Service Cost	$	340,333
2. Interest on the total pension liability		1,117,920
3. Changes of benefit terms		-
4. Difference between expected and actual experience of the total pension liability		(6,694)
5. Changes of assumptions		(514,065)
6. Benefit payments, including refunds of employee contributions		(985,941)
7. Net change in total pension liability	$	(48,447)
8. Total pension liability – beginning		17,521,580
9. Total pension liability – ending	**$**	**17,473,133**
B. Plan fiduciary net position		
1. Contributions – employer	$	212,759
2. Contributions – employee		206,056
3. Net investment income		(1,060,537)
4. Benefit payments, including refunds of employee contributions		(985,941)
5. Pension plan administrative expense		(10,483)
6. Other changes		27,945
7. Net change in plan fiduciary net position	$	(1,610,201)
8. Plan fiduciary net position – beginning		17,440,051
9. Plan fiduciary net position – ending	**$**	**15,829,850**
C. Net pension liability, *A.9. - B.9.*	**$**	**1,643,283**
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9. / A.9.*		**90.60%**
E. Covered-employee payroll	**$**	**3,434,267** (1)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**47.85%**

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

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

Last 10 Fiscal Years (which will be built prospectively)

Fiscal year ending June 30,	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Total Pension Liability										
Service Cost	$ 340,333	$ 270,993	$ 267,779	$ 255,056	$ 455,709	$ 619,666	$ 211,491	$ 210,545	$ 256,155	
Interest on the Total Pension Liability	1,117,920	1,113,853	1,114,756	1,078,390	1,069,154	982,066	1,020,925	1,018,035	922,181	
Benefit Changes	-	-	-	-	(1,711,128)	83,490	-	-	-	
Difference between Expected and Actual Experience	(6,694)	13,632	(12,979)	23,180	(8,132)	49,659	21,209	(493,197)	(44,023)	
Assumption Changes	(514,065)	1,875,179	(465,611)	-	(4,219,074)	(4,691,209)	9,911,319	-	(1,477,308)	
Benefit Payments	(966,698)	(923,364)	(885,517)	(841,776)	(797,027)	(750,526)	(707,361)	(665,821)	(623,942)	
Refunds	(19,243)	(12,556)	(13,725)	(15,199)	(13,533)	(11,576)	(13,345)	(12,026)	(11,986)	
Net Change in Total Pension Liability	$ (48,447)	$ 2,337,737	$ 4,703	$ 499,651	$ (5,224,031)	$ (3,718,430)	$10,444,238	$ 57,536	$ (978,923)	
Total Pension Liability - Beginning	17,521,580	15,183,843	15,179,140	14,679,489	19,903,520	23,621,950	13,177,712	13,120,176	14,099,099	
Total Pension Liability - Ending (a)	**$17,473,133**	**$ 17,521,580**	**$15,183,843**	**$15,179,140**	**$14,679,489**	**$19,903,520**	**$23,621,950**	**$13,177,712**	**$13,120,176**	
Plan Fiduciary Net Position										
Employer Contributions	$ 212,759	$ 206,381	$ 204,006	$ 182,939	$ 164,233	$ 158,352	$ 151,168	$ 146,333	$ 128,037	
Employee Contributions	206,056	199,525	197,897	182,210	166,726	161,670	153,854	149,293	131,033	
Pension Plan Net Investment Income	(1,060,537)	4,098,129	569,670	948,366	1,276,550	1,667,562	(9,633)	501,185	1,829,621	
Benefit Payments	(966,698)	(923,364)	(885,517)	(841,776)	(797,027)	(750,526)	(707,361)	(665,821)	(623,942)	
Refunds	(19,243)	(12,556)	(13,725)	(15,199)	(13,533)	(11,576)	(13,345)	(12,026)	(11,986)	
Pension Plan Administrative Expense	(10,483)	(10,779)	(10,261)	(9,877)	(9,564)	(10,165)	(10,196)	(8,719)	(8,125)	
Other Changes	27,945	27,024	21,332	32,204	20,423	47,232	20,259	29,470	20,528	
Net Change in Plan Fiduciary Net Position	$ (1,610,201)	$ 3,584,360	$ 83,402	$ 478,867	$ 807,808	$ 1,262,549	$ (415,254)	$ 139,715	$ 1,465,166	
Plan Fiduciary Net Position - Beginning	17,440,051	13,855,691	13,772,289	13,293,422	12,485,614	11,223,065	11,638,319	11,498,604	10,033,438	
Plan Fiduciary Net Position - Ending (b)	**$15,829,850**	**$ 17,440,051**	**$13,855,691**	**$13,772,289**	**$13,293,422**	**$12,485,614**	**$11,223,065**	**$11,638,319**	**$11,498,604**	
Net Pension Liability - Ending (a) - (b)	**$ 1,643,283**	**$ 81,529**	**$ 1,328,152**	**$ 1,406,851**	**$ 1,386,067**	**$ 7,417,906**	**$12,398,885**	**$ 1,539,393**	**$ 1,621,572**	
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**90.60 %**	**99.53 %**	**91.25 %**	**90.73 %**	**90.56 %**	**62.73 %**	**47.51 %**	**88.32 %**	**87.64 %**	
Covered-Employee Payroll [1]	**$ 3,434,267**	**$ 3,325,417**	**$ 3,298,283**	**$ 3,168,870**	**$ 3,031,382**	**$ 2,939,455**	**$ 2,797,345**	**$ 2,714,418**	**$ 2,620,660**	
Net Pension Liability as a Percentage of Covered-Employee Payroll	**47.85 %**	**2.45 %**	**40.27 %**	**44.40 %**	**45.72 %**	**252.36 %**	**443.24 %**	**56.71 %**	**61.88 %**	

Notes to Schedule:

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

Schedule of Net Pension Liability Multiyear
(Dollars in Thousands)

Last 10 Fiscal Years (which will be built prospectively)

Fiscal Year Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered-employee Payroll	Net Pension Liability as a % of Covered-employee Payroll
	(a)	(b)	(a) - (b) = (c)	(b) / (a)	(d)	(c) / (d)
2014	$ 13,120,176	$ 11,498,604	$ 1,621,572	87.64%	$ 2,620,660	61.88%
2015	13,177,712	11,638,319	1,539,393	88.32	2,714,418	56.71
2016	23,621,950	11,223,065	12,398,885	47.51	2,797,345	443.24
2017	19,903,520	12,485,614	7,417,906	62.73	2,939,455	252.36
2018	14,679,489	13,293,422	1,386,067	90.56	3,031,382	45.72
2019	15,179,140	13,772,289	1,406,851	90.73	3,168,870	44.40
2020	15,183,843	13,855,691	1,328,152	91.25	3,298,283	40.27
2021	17,521,580	17,440,051	81,529	99.53	3,325,417	2.45
2022	17,473,133	15,829,850	1,643,283	90.60	3,434,267	47.85

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)
2013	$ 181,756	$ 121,673	$ 60,083	$ 2,483,000	4.90%
2014	195,239	128,037	67,202	2,620,660	4.89
2015	198,695	146,333	52,362	2,714,418	5.39
2016	194,136	151,168	42,968	2,797,345	5.40
2017	264,257	158,352	105,905	2,939,455	5.39
2018	234,629	164,233	70,396	3,031,382	5.42
2019	183,161	182,939	222	3,168,870	5.77
2020	184,044	204,006	(19,962)	3,298,283	6.19
2021	151,639	206,381	(54,742)	3,325,417	6.21
2022	107,493	212,759	(105,266)	3,434,267	6.20

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Fiscal Year Ending June 30, 2022 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, 2021
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	27 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.25%
Payroll Growth	3.00%
Salary Increases	Service based table of rates ranging from 13.00% with one year of service to 3.00% with 29 or more years of service, including inflation
Investment Rate of Return	7.50%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition.
Healthy Post-retirement Mortality	Pub-2010 General Retiree Mortality Table adjusted for mortality improvements using projection scale MP-2018. Rates are multiplied by a factor of 1.04 for males and 1.10 for females.
Other Information	
Benefit Increases After Retirement	The post-retirement increase is 1.00% from January 1, 2021 through December 31, 2023, and 1.50% from January 1, 2024 and onward.

See separate funding actuarial valuation report as of July 1, 2021 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-2021

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]	
2013		
2014	18.7	%
2015	4.5	
2016	(0.1)	
2017	15.2	
2018	10.5	
2019	7.3	
2020	4.2	
2021	30.3	
2022	(6.2)	

[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, 2022, the annual money-weighted rate of return for the State Employees Retirement Fund was -6.2%. 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.

Ten-Year Schedule of Money-Weighted Investment Return

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

To request additional information about the computation of the annual money-weighted rate of return and the investments for the Minnesota Retirement Systems (including the investments for MSRS' defined benefit retirement funds), contact SBI at 60 Empire Drive, Suite 355, St. Paul, Minnesota, 55103, via email at minn.sbi@state.mn.us or telephone at 651.296.3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

Asset Allocation

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Estimates for expected future real rates of return (expected returns, net of inflation) were developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce a geometric, long-term expected rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each major asset class that is included in the pension fund's target asset allocation as of June 30, 2022, 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 6.75%. This assumption is based on a review of inflation and investment return assumptions in our report dated July 12, 2022.

Single Discount Rate

A Single Discount Rate of 6.75% 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 6.75%. The projection of cash flows used to determine this Single Discount Rate assumed that employee and employer contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. As a result, 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 6.75%, as well as what the fund's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower (5.75%) or 1-percentage-point higher (7.75%) than the current rate.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 5.75%	Current Single Discount Rate Assumption 6.75%	1% Increase 7.75%
Total Pension Liability	$ 19,686,285	$ 17,473,133	$ 15,642,372
Net Position Restricted for Pensions	15,829,850	15,829,850	15,829,850
Net Pension Liability	**$ 3,856,435**	**$ 1,643,283**	**$ (187,478)**

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

Note that we believe the 7.75% 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	**$ 17,521,580**	**$ 17,440,051**	**$ 81,529**	**$ 1,799,745**	**$ 3,666,712**	
Changes for the Year:						
Service Cost	$ 340,333		$ 340,333			$ 340,333
Interest on Total Pension Liability	1,117,920		1,117,920			1,117,920
Interest on Fiduciary Net Position		$ 1,115,739 (1)	(1,115,739)			(1,115,739)
Changes in Benefit Terms	-		-			-
Liability Experience Gains and Losses	(6,694)		(6,694)	$ -	$ 5,355	(1,339)
Changes in Assumptions	(514,065)		(514,065)	-	411,252	(102,813)
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(7,362)	(4,223)	3,139
Assumption Changes				(375,036)	(936,936)	(561,900)
Investment Gains/(Losses)				(95,210)	(687,186)	(591,976)
Contributions - Employer		212,759	(212,759)			
Contributions - Employees		206,056	(206,056)			(206,056)
Asset Gain/(Loss)		(2,176,276) (1)	2,176,276	1,741,021	-	435,255
Benefit Payments and Refunds	(985,941)	(985,941)	-			
Administrative Expenses		(10,483)	10,483			10,483
Other changes		27,945	(27,945)			(27,945)
Net Changes	**$ (48,447)**	**$ (1,610,201)**	**$ 1,561,754**	**$ 1,263,413**	**$ (1,211,738)**	**$ (700,638)**
Balance End of Year	**$ 17,473,133**	**$ 15,829,850**	**$ 1,643,283**	**$ 3,063,158**	**$ 2,454,974**	

(1) The sum of these items in column (b) equals the net investment income of -$1,060,537.

Summary of Population Statistics

		Terminated*		Recipients**			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on July 1, 2021	**50,889**	**17,317**	**9,562**	**39,335**	**1,738**	**4,357**	**123,198**
New members	6,170						**6,170**
Return to active	435	(206)	(229)	0	0	0	**0**
Terminated non-vested	(2,362)	0	2,362	0	0	0	**0**
Service retirements	(1,523)	(777)	0	2,300	0	0	**0**
Unclassified retirements	0	0	0	55	0	0	**55**
Terminated deferred	(1,516)	1,516	0	0	0	0	**0**
Terminated refund/transfer	(724)	(159)	(1,428)	0	0	0	**(2,311)**
Deaths	(112)	(42)	(11)	(1,137)	(78)	(249)	**(1,629)**
New beneficiary	0	0	0	0	0	438	**438**
Disabled	(38)	0	0	0	38	0	**0**
Data adjustments	0	173	412	57	33	(41)	**634**
Net change	330	505	1,106	1,275	(7)	148	**3,357**
Members on July 1, 2022	**51,219**	**17,822**	**10,668**	**40,610**	**1,731**	**4,505**	**126,555**

* *Includes members in the General and Military Affairs Plans.*

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

SECTION E

SUMMARY OF BENEFITS

Summary of Plan Provisions

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

Plan Year	July 1 through June 30.
Eligibility	State employees, non-academic staff of the University of Minnesota and employees of certain Metro level government units, unless excluded by law.
Contributions	Shown as a percent of salary: **Effective as of** / **Member** / **Employer** July 1, 2019 / 6.00% / 6.25% Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
Allowable Service	Service during which member contributions were made. May also include certain leaves of absence, military service and periods while temporary Worker's Compensation is paid. Excludes lump sum vacation and severance pay at termination.
Average Salary	Average of the five highest successive years of Salary. Average Salary is based on all Allowable Service if less than five years.
Salary	Includes wages, allowances and fees. Excludes lump sum payments at separation, employer contributions to deferred compensation and tax-sheltered annuity plans and benevolent vacation and sick leave donation programs.
Retirement	
Normal retirement benefit	
Age/Service requirement	First hired before July 1, 1989: (a.) Age 65 and three years of Allowable Service. (b.) Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service. First hired after June 30, 1989: (a.) The greater of age 65 or the age eligible for full Social Security retirement benefits (but not higher than age 66) and three years of Allowable Service (five years if hired after June 30, 2010). (b.) Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service.
Amount	1.70% of Average Salary for each year of Allowable Service.

Summary of Plan Provisions (Continued)

Retirement (Continued)

Early retirement

Age/Service requirement

First hired before July 1, 1989:

(a.) Age 55 and three years of Allowable Service.

(b.) Any age with 30 years of Allowable Service.

(c.) Rule of 90: Age plus Allowable Service totals 90.

First hired after June 30, 1989:

(a.) Age 55 and three years (five years if hired after June 30, 2010) of Allowable Service.

Amount

First hired before July 1, 1989:

The greater of (a) or (b):

(a.) 1.20% of Average Salary for each of the first ten years of Allowable Service and 1.70% of Average Salary for each subsequent year with reduction of 0.25% for each month the member is under age 65 at time of retirement or under age 62 if 30 or more years of Allowable Service. No reduction if age plus years of Allowable Service totals 90.

(b.) 1.70% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the member is under age 65. Augmentation adjustment is phased out over a five-year period starting July 1, 2019, resulting in no augmentation adjustment after June 30, 2024.

First hired after June 30, 1989:

1.70% of Average Salary for each year of Allowable Service assuming augmentation to the age eligible for full Social Security retirement benefit (but not higher than age 66) at 3.00% (2.50% if hired after June 30, 2006) per year and actuarial reduction for each month the member is under the normal retirement age. Augmentation adjustment is phased out over a five-year period starting July 1, 2019, resulting in no augmentation adjustment after June 30, 2024.

Form of payment

Life annuity with return on death of any balance of member contributions over aggregate monthly payments. Actuarially equivalent options are:

(a.) 50%, 75%, or 100% Joint and Survivor with bounce back feature without additional reduction.

(b.) 15-year Certain and Life.

Benefit increases

Through December 31, 2018: 2.0%

January 1, 2019 – December 31, 2023: 1.0%

January 1, 2024 and after: 1.5%

For retirements on or after January 1, 2024, the first benefit increase is delayed until the retiree reaches Normal Retirement Age (not applicable to Rule of 90 retirees, disability benefit recipients, or survivors).

Summary of Plan Provisions (Continued)

Retirement (Continued)

Benefit increases (Continued)	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.
	Prior to 2002, members who retired under the laws in effect before July 1, 1973, received an additional lump sum payment each year. In 1989, this lump sum payment was the greater of $25 times each full year of Allowable Service or $400 per full year of service less any Social Security benefits received or annuity from a Minnesota public employee pension plan. In each following year, the lump sum payment was increased by the same percentage increase that was applied to regular annuities paid from the Minnesota Post Retirement Investment Fund. Effective January 1, 2002, the annual lump sum payment was divided by 12 and paid as a monthly life annuity in the annuity form elected.

Disability

Disability benefit	
Age/Service requirement	Total and permanent disability before normal retirement age with three years of Allowable Service (five years if hired after June 30, 2010).
Amount	Normal Retirement benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age.
	Payments stop if disability ceases or death occurs. Payments revert to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment.
Retirement after disability	
Age/Service requirement	Normal retirement age with continued disability.
Amount	Any optional annuity continues. Otherwise, a normal retirement benefit equal to the disability benefit paid before normal retirement age, or an actuarially equivalent optional annuity.
Form of payment	Same as for retirement.
Benefit Increases	Same as for retirement, except benefit increases are paid prior to Normal Retirement.

Summary of Plan Provisions (Continued)

Death

Surviving spouse optional benefit

Age/Service requirement	Member or former member who dies before retirement or disability benefits commence with three years of Allowable Service (five years if hired after June 30, 2010). If a former member dies before age 55 and has less than 30 years of Allowable Service, benefits commence when the former member would have been age 55. If an active member dies, benefits may commence immediately, regardless of age.
Amount	Surviving spouse receives the 100% joint and survivor benefits using the Normal Retirement formula above. If commencement is prior to age 55, the appropriate early retirement formula described above applies except that one-half the monthly reduction factor is used from age 55 to the commencement age and the Rule of 90 does not apply. In lieu of this benefit, the surviving spouse may elect a refund of member contributions with interest or an actuarially equivalent term certain annuity. If a member dies prior to July 1, 1997, and the beneficiary was not eligible to commence a survivor benefit as of July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement, except benefit increases are paid prior to Normal Retirement.

Surviving dependent children's benefit

Age/Service requirement	If no surviving spouse, all children (biological or adopted) below age 20 who are dependent for more than half of their support on deceased member.
Amount	Actuarially equivalent 100% joint and survivor annuity to surviving spouse payable to the later of age 20 or five years. The amount is proportionally divided among surviving children.
Benefit increases	Same as for retirement, except benefit increases are paid prior to Normal Retirement.

Refund of contributions

Age/Service requirement	Active member dies and survivor benefits are not payable or a former member dies before annuity begins or former member who is not entitled to an annuity dies.
Amount	Member's contributions with 6.00% interest through June 30, 2011. Beginning July 1, 2011, a member's contributions increase at 4.00% interest. Beginning July 1, 2018, a member's contributions increase at 3.00% interest.

Summary of Plan Provisions (Continued)

Death (Continued)	
Refund of contributions (Continued)	
Age/Service requirement	Retired or disabled annuitant who did not select an optional annuity dies, or the remaining recipient of an option dies.
Amount	The excess of the member's contributions over all benefits paid.
Unclassified Plan Provision	Eligible members credited with employee shares in the Unclassified Plan may elect to terminate participation in the Unclassified Plan and be covered by the State Employees Retirement Fund prior to termination of covered employment assuming that the member has acquired at least 10 years of allowable state service (no more than seven years of service if hired after June 30, 2010).
Termination	
Refund of contributions	
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 at 4.00% interest. Beginning July 1, 2018, a member's contributions increase at 3.00% interest. If a member is vested, a deferred annuity may be elected in lieu of a refund.
Deferred benefit	
Age/Service requirement	Three years of Allowable Service if hired prior to June 30, 2010, five years of Allowable Service if hired after June 30, 2010.
Amount	Benefit computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1 of the year following attainment of age 55 or January 1, 2012, whichever is earlier; (d.) 5.00% thereafter until the annuity begins (2.50% if hired after June 30, 2006), but before January 1, 2012; (e.) 2.00% from January 1, 2012 through December 31, 2018; and (f.) 0.00% from January 1, 2019, thereafter. Amount is payable at normal or early retirement. If a member terminated employment prior to July 1, 1997, but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.

Summary of Plan Provisions (Concluded)

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 is combined in order to determine eligibility for early retirement. (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Actuarial Equivalent Factors	Actuarially equivalent factors based on RP-2014 mortality for healthy annuitants, white collar adjustment, male rates set forward two years, projected to 2019 using Scale MP-2015, blended 50% males, 5.88% post-retirement interest, and 7.50% pre-retirement interest. Based upon statutory requirements; joint and survivor factors are based on an interest assumption of 6.50%.
Changes in Plan Provisions	There have been no changes in plan provisions since the previous 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 for 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 last experience study, dated June 27, 2019, and a review of inflation and investment return assumptions dated July 12, 2022. 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. The MSRS Board selected the long-term expected rate of investment return of 6.75% based on input from GRS that the proposed selection would be reasonable for the purpose of the measurement.

Investment return	6.75% per annum.
Single discount rate	6.75% 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 projection scale MP-2018. Rates are multiplied by a factor of 0.97 for males and 1.06 for females.
Healthy Post-retirement	Pub-2010 Healthy Retired General Mortality Table, adjusted for mortality improvements using projection scale MP-2018. Rates are multiplied by a factor of 1.04 for males and 1.10 for females.
Disabled	Pub-2010 General/Teacher Disabled Retiree Mortality Table, adjusted for mortality improvements using projection scale MP-2018. Rates are set forward two years for males and set forward five years for females.
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 and beneficiaries younger than age 50 who are receiving a benefit by deriving rates based on the employee table and the juvenile table. Similarly, we have extended the employee table as needed for members older than age 80 by deriving rates based on the annuitant table.
Retirement	Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. Note that significant plan changes reflected in this report may result in behavior changes that are not anticipated in the current retirement rates.
Withdrawal	Service-related rates based on experience; see table of sample rates.

Summary of Actuarial Assumptions (Continued)

Disability	Age-related rates based on experience; see table of sample rates.
Allowance for combined service annuity	Liabilities for former, vested members are increased by 4.00%, and liabilities for former, non-vested members are increased by 5.00% 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 percent 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 normal retirement age.
Percentage married	80% of active male members and 60% of female members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Male members are assumed to have a beneficiary two years younger and female members are assumed to have a beneficiary two years older.
Form of payment	Married members retiring from active status are assumed to elect subsidized Joint and Survivor form of annuity as follows: Males: 10% elect 50% Joint & Survivor option 15% elect 75% Joint & Survivor option 65% elect 100% Joint & Survivor option Females: 15% elect 50% Joint & Survivor option 10% elect 75% Joint & Survivor option 40% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option. Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a life annuity.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement operation	Withdrawal decrements do not operate during retirement eligibility. 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.
Unclassified plan reversion	Liabilities for active members are increased by 0.14% to account for the effect of Unclassified members who elect coverage under the State Employees Retirement Fund.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by 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 218 members reported with zero or invalid salary (<$100). We used prior year salary (107 members), if available, otherwise, high five salary with a 10% load to account for salary increases (99 members). If neither pay or high five salary was available, we assumed a value of $45,000 (12 members). There were 16 members reported with zero or negative service. Due to the small number of members with zero service, and based on direction from MSRS, we used service of 0 years for these members. There were also 214 members reported without a gender and 8 members reported with an invalid date of birth. We assumed the member was hired at age 37 and female gender. <u>Data for terminated members:</u> There were 249 members reported with a missing or invalid benefit. If available, we calculated benefits for these members using the reported Average Salary, Credited Service and Termination Date provided. If Average Salary was not reported or invalid (244 members), we assumed a value of $40,000. If termination date was not reported (4 members), we assumed the member terminated at age 40 (or current age if younger than 40). If credited service was either not reported or invalid (4 members), we assumed a value of 5.0 years. There were no members with a missing date of birth and two members with an invalid gender. We assumed female gender for the valuation. <u>Data for members receiving benefits:</u> There were 51 members reported without a gender. We assumed female gender for the valuation. No retired members were reported with an invalid date of birth. There was one member 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 19 survivor members reported with a certain and life option but with a certain end date prior to the valuation date. These members were excluded from the valuation. There were 101 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity (i.e. "bounce back,") if applicable.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members (Concluded)	Data for members receiving benefits: There were 117 retirees reported with a bounceback annuity but were not reported with a reasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively. There were retired members reported with a survivor option and an invalid or missing survivor gender (3,136 members) and/or survivor date of birth (2,676 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.
Changes in actuarial assumptions	The investment return and single discount rate were changed from 6.50% to 6.75%.

Summary of Actuarial Assumptions (Continued)

	Percent of Members Dying Each Year*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality**	
Age in 2022	Male	Female	Male	Female	Male	Female
20	0.04%	0.01%	0.04%	0.01%	0.34%	0.17%
25	0.03%	0.01%	0.03%	0.01%	0.29%	0.29%
30	0.05%	0.02%	0.04%	0.02%	0.49%	0.50%
35	0.06%	0.03%	0.06%	0.03%	0.69%	0.80%
40	0.08%	0.04%	0.08%	0.04%	0.90%	1.12%
45	0.11%	0.07%	0.09%	0.06%	1.20%	1.45%
50	0.28%	0.23%	0.13%	0.08%	1.65%	1.66%
55	0.43%	0.33%	0.20%	0.13%	2.17%	2.02%
60	0.65%	0.44%	0.32%	0.21%	2.73%	2.36%
65	0.95%	0.65%	0.46%	0.30%	3.37%	2.74%
70	1.48%	1.05%	0.64%	0.46%	4.06%	3.58%
75	2.49%	1.85%	0.95%	0.76%	5.31%	5.36%
80	4.43%	3.39%	1.50%	1.29%	7.65%	8.55%
85	8.08%	6.38%	6.33%	5.28%	11.39%	12.77%
90	13.97%	11.85%	13.03%	11.42%	17.52%	18.10%

* *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-2018 from a base year of 2010.*

	Percent of Members Decrementing Each Year	
	Disability Retirement	
Age	Male	Female
20	0.01%	0.01%
25	0.01	0.01
30	0.01	0.01
35	0.01	0.01
40	0.04	0.04
45	0.08	0.08
50	0.15	0.15
55	0.22	0.22
60	0.33	0.33
65	0.00	0.00

Summary of Actuarial Assumptions (Continued)

	Percent Retiring Each Year		
Age	Rule of 90 Eligible	Hired prior to 7/1/1989	Hired after 6/30/1989
55	16.0%	3.0%	4.0%
56	12.5	3.0	4.0
57	12.5	4.0	4.0
58	11.5	4.0	4.0
59	12.5	5.0	4.0
60	14.0	7.0	5.0
61	15.0	8.0	7.5
62	25.0	16.0	13.0
63	22.0	16.0	13.0
64	20.0	16.0	13.0
65	35.0	35.0	20.0
66	35.0	35.0	35.0
67	30.0	30.0	30.0
68	25.0	25.0	25.0
69	25.0	25.0	25.0
70	30.0	30.0	30.0
71+	100.0	100.0	100.0

Summary of Actuarial Assumptions (Concluded)

Salary Scale	
Year	Increase
1	13.00%
2	9.00
3	5.80
4	5.40
5	5.00
6	4.90
7	4.80
8	4.60
9	4.50
10	4.20
11	4.10
12	4.00
13	3.90
14	3.80
15	3.70
16	3.60
17	3.50
18	3.50
19	3.50
20	3.40
21	3.30
22	3.30
23	3.20
24	3.20
25	3.20
26	3.20
27	3.10
28	3.10
29	3.00
30+	3.00

Percent of Members Terminating (Withdrawing) Each Year		
Year	Males	Females
1	20.00%	20.50%
2	15.00	17.00
3	10.00	13.00
4	8.50	10.50
5	7.50	9.50
6	7.00	8.50
7	6.00	8.00
8	4.75	6.75
9	4.25	6.00
10	4.00	5.00
11	3.50	4.50
12	3.00	4.25
13	2.75	4.00
14	2.50	3.75
15	2.25	3.50
16	2.25	3.25
17	2.25	2.75
18	2.25	2.50
19	2.00	2.50
20	1.50	2.50
21	1.25	2.50
22	1.25	2.40
23	1.00	2.30
24	1.00	2.20
25	1.00	2.10
26	1.00	2.00
27	1.00	1.75
28	1.00	1.75
29	1.00	1.50
30+	1.00	1.00

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 6.75%; the municipal bond rate is 3.69% (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). **The resulting single discount rate as of June 30, 2022 is 6.75%.** 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)

Fiscal Year Ending	Projected Covered-Employee Payroll			Projected Contributions			
	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) * 6.0%	(e) = (a) * 6.25%	(f)	(g) = (d) + (e) + (f)
2022	$ 3,434,267		$ 3,434,267				
2023	3,374,187	$ 95,660	3,469,847	$ 202,451	$ 210,887	$ 2,458	$ 415,796
2024	3,203,295	370,648	3,573,943	192,198	200,206	9,526	401,930
2025	3,042,793	638,368	3,681,161	182,568	190,175	16,406	389,149
2026	2,912,829	878,767	3,791,596	174,770	182,052	22,584	379,406
2027	2,793,664	1,111,680	3,905,344	167,620	174,604	28,570	370,794
2028	2,683,029	1,339,475	4,022,504	160,982	167,689	34,424	363,095
2029	2,579,245	1,563,934	4,143,179	154,755	161,203	40,193	356,151
2030	2,480,212	1,787,262	4,267,474	148,813	155,013	45,933	349,759
2031	2,385,140	2,010,359	4,395,499	143,108	149,071	51,666	343,845
2032	2,293,638	2,233,726	4,527,364	137,618	143,352	57,407	338,377
2033	2,205,034	2,458,150	4,663,184	132,302	137,815	63,174	333,291
2034	2,118,373	2,684,707	4,803,080	127,102	132,398	68,997	328,497
2035	2,033,063	2,914,109	4,947,172	121,984	127,066	74,893	323,943
2036	1,948,833	3,146,755	5,095,588	116,930	121,802	80,872	319,604
2037	1,866,210	3,382,245	5,248,455	111,973	116,638	86,924	315,535
2038	1,785,579	3,620,330	5,405,909	107,135	111,599	93,042	311,776
2039	1,706,275	3,861,811	5,568,086	102,377	106,642	99,249	308,268
2040	1,627,082	4,108,047	5,735,129	97,625	101,693	105,577	304,895
2041	1,546,701	4,360,482	5,907,183	92,802	96,669	112,064	301,535
2042	1,465,093	4,619,305	6,084,398	87,906	91,568	118,716	298,190
2043	1,383,094	4,883,836	6,266,930	82,986	86,443	125,515	294,944
2044	1,300,626	5,154,312	6,454,938	78,038	81,289	132,466	291,793
2045	1,216,733	5,431,853	6,648,586	73,004	76,046	139,599	288,649
2046	1,131,114	5,716,930	6,848,044	67,867	70,695	146,925	285,487
2047	1,044,525	6,008,960	7,053,485	62,672	65,283	154,430	282,385
2048	958,345	6,306,744	7,265,089	57,501	59,897	162,083	279,481
2049	873,042	6,610,000	7,483,042	52,383	54,565	169,877	276,825
2050	788,980	6,918,553	7,707,533	47,339	49,311	177,807	274,457
2051	707,089	7,231,670	7,938,759	42,425	44,193	185,854	272,472
2052	628,286	7,548,636	8,176,922	37,697	39,268	194,000	270,965
2053	553,300	7,868,930	8,422,230	33,198	34,581	202,231	270,010
2054	482,964	8,191,933	8,674,897	28,978	30,185	210,533	269,696
2055	417,568	8,517,576	8,935,144	25,054	26,098	218,902	270,054
2056	356,973	8,846,225	9,203,198	21,418	22,311	227,348	271,077
2057	301,337	9,177,957	9,479,294	18,080	18,834	235,873	272,787
2058	251,015	9,512,658	9,763,673	15,061	15,688	244,475	275,224
2059	205,982	9,850,601	10,056,583	12,359	12,874	253,160	278,393
2060	166,187	10,192,093	10,358,280	9,971	10,387	261,937	282,295
2061	131,224	10,537,805	10,669,029	7,873	8,202	270,822	286,897
2062	101,025	10,888,075	10,989,100	6,062	6,314	279,824	292,200
2063	75,948	11,242,825	11,318,773	4,557	4,747	288,941	298,245
2064	55,442	11,602,894	11,658,336	3,327	3,465	298,194	304,986
2065	38,997	11,969,089	12,008,086	2,340	2,437	307,606	312,383
2066	26,430	12,341,898	12,368,328	1,586	1,652	317,187	320,425
2067	17,198	12,722,180	12,739,378	1,032	1,075	326,960	329,067
2068	10,647	13,110,913	13,121,560	639	665	336,950	338,254
2069	6,205	13,509,001	13,515,206	372	388	347,181	347,941
2070	3,251	13,917,412	13,920,663	195	203	357,677	358,075
2071	1,518	14,336,764	14,338,282	91	95	368,455	368,641
2072	675	14,767,756	14,768,431	41	42	379,531	379,614

* *Equal to total contributions (12.25% of payroll for new employees) net of normal cost and expenses (9.68% of payroll).*

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

Fiscal Year Ending	Projected Covered-Employee Payroll: Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Projected Contributions: Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) * 6.0%	(e) = (a) * 6.25%	(f)	(g) = (d) + (e) + (f)
2073	$ 280	$ 15,211,204	$ 15,211,484	$ 17	$ 18	$ 390,928	$ 390,963
2074	109	15,667,719	15,667,828	7	7	402,660	402,674
2075	36	16,137,827	16,137,863	2	2	414,742	414,746
2076	12	16,621,987	16,621,999	1	1	427,185	427,187
2077	1	17,120,658	17,120,659	-	-	440,001	440,001
2078	-	17,634,279	17,634,279	-	-	453,201	453,201
2079	-	18,163,307	18,163,307	-	-	466,797	466,797
2080	-	18,708,206	18,708,206	-	-	480,801	480,801
2081	-	19,269,453	19,269,453	-	-	495,225	495,225
2082	-	19,847,536	19,847,536	-	-	510,082	510,082
2083	-	20,442,962	20,442,962	-	-	525,384	525,384
2084	-	21,056,251	21,056,251	-	-	541,146	541,146
2085	-	21,687,939	21,687,939	-	-	557,380	557,380
2086	-	22,338,577	22,338,577	-	-	574,101	574,101
2087	-	23,008,734	23,008,734	-	-	591,324	591,324
2088	-	23,698,996	23,698,996	-	-	609,064	609,064
2089	-	24,409,966	24,409,966	-	-	627,336	627,336
2090	-	25,142,265	25,142,265	-	-	646,156	646,156
2091	-	25,896,533	25,896,533	-	-	665,541	665,541
2092	-	26,673,429	26,673,429	-	-	685,507	685,507
2093	-	27,473,632	27,473,632	-	-	706,072	706,072
2094	-	28,297,841	28,297,841	-	-	727,255	727,255
2095	-	29,146,776	29,146,776	-	-	749,072	749,072
2096	-	30,021,179	30,021,179	-	-	771,544	771,544
2097	-	30,921,815	30,921,815	-	-	794,691	794,691
2098	-	31,849,469	31,849,469	-	-	818,531	818,531
2099	-	32,804,953	32,804,953	-	-	843,087	843,087
2100	-	33,789,102	33,789,102	-	-	868,380	868,380
2101	-	34,802,775	34,802,775	-	-	894,431	894,431
2102	-	35,846,858	35,846,858	-	-	921,264	921,264
2103	-	36,922,264	36,922,264	-	-	948,902	948,902
2104	-	38,029,932	38,029,932	-	-	977,369	977,369
2105	-	39,170,830	39,170,830	-	-	1,006,690	1,006,690
2106	-	40,345,954	40,345,954	-	-	1,036,891	1,036,891
2107	-	41,556,333	41,556,333	-	-	1,067,998	1,067,998
2108	-	42,803,023	42,803,023	-	-	1,100,038	1,100,038
2109	-	44,087,114	44,087,114	-	-	1,133,039	1,133,039
2110	-	45,409,727	45,409,727	-	-	1,167,030	1,167,030
2111	-	46,772,019	46,772,019	-	-	1,202,041	1,202,041
2112	-	48,175,180	48,175,180	-	-	1,238,102	1,238,102
2113	-	49,620,435	49,620,435	-	-	1,275,245	1,275,245
2114	-	51,109,048	51,109,048	-	-	1,313,503	1,313,503
2115	-	52,642,319	52,642,319	-	-	1,352,908	1,352,908
2116	-	54,221,589	54,221,589	-	-	1,393,495	1,393,495
2117	-	55,848,237	55,848,237	-	-	1,435,300	1,435,300
2118	-	57,523,684	57,523,684	-	-	1,478,359	1,478,359
2119	-	59,249,394	59,249,394	-	-	1,522,709	1,522,709
2120	-	61,026,876	61,026,876	-	-	1,568,391	1,568,391
2121	-	62,857,682	62,857,682	-	-	1,615,442	1,615,442
2122	-	64,743,413	64,743,413	-	-	1,663,906	1,663,906

* *Equal to total contributions (12.25% of payroll for new employees) net of normal cost and expenses (9.68% of payroll).*

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

Fiscal Year Ending	Projected Beginning Plan Net Fiduciary Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 6.75%	Projected Ending Plan Fiduciary Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2023	$ 15,829,850	$ 415,796	$ 1,022,765	$ 10,123	$ 1,048,028	$ 16,260,787
2024	16,260,787	401,930	1,065,013	9,610	1,075,270	16,663,364
2025	16,663,364	389,149	1,109,949	9,128	1,100,544	17,033,979
2026	17,033,979	379,406	1,148,358	8,738	1,123,975	17,380,263
2027	17,380,263	370,794	1,184,101	8,381	1,145,889	17,704,464
2028	17,704,464	363,095	1,222,010	8,049	1,166,269	18,003,769
2029	18,003,769	356,151	1,257,942	7,738	1,185,059	18,279,300
2030	18,279,300	349,759	1,291,738	7,441	1,202,333	18,532,212
2031	18,532,212	343,845	1,323,527	7,155	1,218,162	18,763,538
2032	18,763,538	338,377	1,353,398	6,881	1,232,613	18,974,250
2033	18,974,250	333,291	1,380,885	6,615	1,245,763	19,165,804
2034	19,165,804	328,497	1,406,176	6,355	1,257,703	19,339,473
2035	19,339,473	323,943	1,429,652	6,099	1,268,504	19,496,168
2036	19,496,168	319,604	1,452,474	5,847	1,278,187	19,635,639
2037	19,635,639	315,535	1,472,905	5,599	1,286,796	19,759,467
2038	19,759,467	311,776	1,490,787	5,357	1,294,444	19,869,543
2039	19,869,543	308,268	1,506,393	5,119	1,301,248	19,967,547
2040	19,967,547	304,895	1,519,842	4,881	1,307,312	20,055,030
2041	20,055,030	301,535	1,533,183	4,640	1,312,671	20,131,413
2042	20,131,413	298,190	1,545,185	4,395	1,317,326	20,197,349
2043	20,197,349	294,944	1,556,013	4,149	1,321,317	20,253,447
2044	20,253,447	291,793	1,565,499	3,902	1,324,692	20,300,531
2045	20,300,531	288,649	1,574,797	3,650	1,327,466	20,338,199
2046	20,338,199	285,487	1,584,580	3,393	1,329,587	20,365,299
2047	20,365,299	282,385	1,594,411	3,134	1,330,996	20,381,135
2048	20,381,135	279,481	1,603,653	2,875	1,331,670	20,385,758
2049	20,385,758	276,825	1,612,152	2,619	1,331,620	20,379,432
2050	20,379,432	274,457	1,620,162	2,367	1,330,857	20,362,218
2051	20,362,218	272,472	1,627,063	2,121	1,329,408	20,334,915
2052	20,334,915	270,965	1,632,680	1,885	1,327,337	20,298,651
2053	20,298,651	270,010	1,636,593	1,660	1,324,735	20,255,143
2054	20,255,143	269,696	1,638,120	1,449	1,321,744	20,207,014
2055	20,207,014	270,054	1,636,893	1,253	1,318,554	20,157,476
2056	20,157,476	271,077	1,633,634	1,071	1,315,359	20,109,207
2057	20,109,207	272,787	1,628,203	904	1,312,343	20,065,231
2058	20,065,231	275,224	1,619,719	753	1,309,742	20,029,726
2059	20,029,726	278,393	1,608,421	618	1,307,831	20,006,911
2060	20,006,911	282,295	1,594,456	499	1,306,888	20,001,139
2061	20,001,139	286,897	1,577,600	394	1,307,214	20,017,255
2062	20,017,255	292,200	1,557,713	303	1,309,141	20,060,579
2063	20,060,579	298,245	1,534,125	228	1,313,052	20,137,522
2064	20,137,522	304,986	1,506,588	166	1,319,385	20,255,140
2065	20,255,140	312,383	1,475,481	117	1,328,604	20,420,529
2066	20,420,529	320,425	1,440,313	79	1,341,204	20,641,764
2067	20,641,764	329,067	1,401,219	52	1,357,723	20,927,284
2068	20,927,284	338,254	1,359,052	32	1,378,701	21,285,156
2069	21,285,156	347,941	1,314,429	19	1,404,661	21,723,311
2070	21,723,311	358,075	1,267,865	10	1,436,119	22,249,631
2071	22,249,631	368,641	1,219,555	5	1,473,601	22,872,313
2072	22,872,313	379,614	1,169,767	2	1,517,649	23,599,807

For purposes of this projection, we assumed the 6.25% regular employer statutory contribution rate would continue after the plan becomes fully funded.

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

Fiscal Year Ending	Projected Beginning Plan Net Fiduciary Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 6.75%	Projected Ending Plan Fiduciary Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2073	$ 23,599,807	$ 390,963	$ 1,118,790	$ 1	$ 1,568,824	$ 24,440,803
2074	24,440,803	402,674	1,066,842	-	1,627,704	25,404,338
2075	25,404,338	414,746	1,014,078	-	1,694,896	26,499,903
2076	26,499,903	427,187	960,636	-	1,771,033	27,737,487
2077	27,737,487	440,001	906,680	-	1,856,787	29,127,595
2078	29,127,595	453,201	852,385	-	1,952,860	30,681,271
2079	30,681,271	466,797	797,969	-	2,059,991	32,410,089
2080	32,410,089	480,801	743,673	-	2,178,954	34,326,171
2081	34,326,171	495,225	689,762	-	2,310,558	36,442,192
2082	36,442,192	510,082	636,516	-	2,455,650	38,771,408
2083	38,771,408	525,384	584,229	-	2,615,116	41,327,680
2084	41,327,680	541,146	533,194	-	2,789,882	44,125,514
2085	44,125,514	557,380	483,705	-	2,980,918	47,180,107
2086	47,180,107	574,101	436,040	-	3,189,241	50,507,409
2087	50,507,409	591,324	390,458	-	3,415,919	54,124,194
2088	54,124,194	609,064	347,189	-	3,662,077	58,048,147
2089	58,048,147	627,336	306,427	-	3,928,904	62,297,960
2090	62,297,960	646,156	268,330	-	4,217,656	66,893,441
2091	66,893,441	665,541	233,014	-	4,529,667	71,855,634
2092	71,855,634	685,507	200,551	-	4,866,355	77,206,946
2093	77,206,946	706,072	170,970	-	5,229,234	82,971,282
2094	82,971,282	727,255	144,263	-	5,619,916	89,174,190
2095	89,174,190	749,072	120,385	-	6,040,130	95,843,006
2096	95,843,006	771,544	99,263	-	6,491,722	103,007,010
2097	103,007,010	794,691	80,792	-	6,976,674	110,697,582
2098	110,697,582	818,531	64,844	-	7,497,108	118,948,378
2099	118,948,378	843,087	51,266	-	8,055,303	127,795,503
2100	127,795,503	868,380	39,875	-	8,653,702	137,277,709
2101	137,277,709	894,431	30,484	-	9,294,928	147,436,585
2102	147,436,585	921,264	22,879	-	9,981,795	158,316,765
2103	158,316,765	948,902	16,838	-	10,717,325	169,966,154
2104	169,966,154	977,369	12,139	-	11,504,760	182,436,144
2105	182,436,144	1,006,690	8,564	-	12,347,576	195,781,846
2106	195,781,846	1,036,891	5,907	-	13,249,502	210,062,332
2107	210,062,332	1,067,998	3,982	-	14,214,532	225,340,880
2108	225,340,880	1,100,038	2,622	-	15,246,942	241,685,237
2109	241,685,237	1,133,039	1,688	-	16,351,313	259,167,901
2110	259,167,901	1,167,030	1,064	-	17,532,542	277,866,409
2111	277,866,409	1,202,041	659	-	18,795,867	297,863,657
2112	297,863,657	1,238,102	404	-	20,146,887	319,248,243
2113	319,248,243	1,275,245	246	-	21,591,585	342,114,827
2114	342,114,827	1,313,503	152	-	23,136,353	366,564,530
2115	366,564,530	1,352,908	97	-	24,788,018	392,705,358
2116	392,705,358	1,393,495	64	-	26,553,872	420,652,660
2117	420,652,660	1,435,300	46	-	28,441,703	450,529,618
2118	450,529,618	1,478,359	34	-	30,459,828	482,467,771
2119	482,467,771	1,522,709	27	-	32,617,126	516,607,579
2120	516,607,579	1,568,391	22	-	34,923,080	553,099,028
2121	553,099,028	1,615,442	18	-	37,387,815	592,102,268
2122	592,102,268	1,663,906	55	-	40,022,141	633,788,260

For purposes of this projection, we assumed the 6.25% statutory regular employer statutory contribution rate would continue after the plan becomes fully funded.

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

Fiscal Year Ending	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
2023	$ 15,829,850	$ 1,022,765	$ 1,022,765	$ -	$ 989,901	$ -	$ 989,901
2024	16,260,787	1,065,013	1,065,013	-	965,613	-	965,613
2025	16,663,364	1,109,949	1,109,949	-	942,722	-	942,722
2026	17,033,979	1,148,358	1,148,358	-	913,670	-	913,670
2027	17,380,263	1,184,101	1,184,101	-	882,538	-	882,538
2028	17,704,464	1,222,010	1,222,010	-	853,201	-	853,201
2029	18,003,769	1,257,942	1,257,942	-	822,753	-	822,753
2030	18,279,300	1,291,738	1,291,738	-	791,435	-	791,435
2031	18,532,212	1,323,527	1,323,527	-	759,637	-	759,637
2032	18,763,538	1,353,398	1,353,398	-	727,663	-	727,663
2033	18,974,250	1,380,885	1,380,885	-	695,496	-	695,496
2034	19,165,804	1,406,176	1,406,176	-	663,451	-	663,451
2035	19,339,473	1,429,652	1,429,652	-	631,876	-	631,876
2036	19,496,168	1,452,474	1,452,474	-	601,370	-	601,370
2037	19,635,639	1,472,905	1,472,905	-	571,269	-	571,269
2038	19,759,467	1,490,787	1,490,787	-	541,643	-	541,643
2039	19,869,543	1,506,393	1,506,393	-	512,706	-	512,706
2040	19,967,547	1,519,842	1,519,842	-	484,574	-	484,574
2041	20,055,030	1,533,183	1,533,183	-	457,918	-	457,918
2042	20,131,413	1,545,185	1,545,185	-	432,321	-	432,321
2043	20,197,349	1,556,013	1,556,013	-	407,823	-	407,823
2044	20,253,447	1,565,499	1,565,499	-	384,364	-	384,364
2045	20,300,531	1,574,797	1,574,797	-	362,199	-	362,199
2046	20,338,199	1,584,580	1,584,580	-	341,404	-	341,404
2047	20,365,299	1,594,411	1,594,411	-	321,801	-	321,801
2048	20,381,135	1,603,653	1,603,653	-	303,200	-	303,200
2049	20,385,758	1,612,152	1,612,152	-	285,533	-	285,533
2050	20,379,432	1,620,162	1,620,162	-	268,808	-	268,808
2051	20,362,218	1,627,063	1,627,063	-	252,883	-	252,883
2052	20,334,915	1,632,680	1,632,680	-	237,711	-	237,711
2053	20,298,651	1,636,593	1,636,593	-	223,213	-	223,213
2054	20,255,143	1,638,120	1,638,120	-	209,294	-	209,294
2055	20,207,014	1,636,893	1,636,893	-	195,913	-	195,913
2056	20,157,476	1,633,634	1,633,634	-	183,160	-	183,160
2057	20,109,207	1,628,203	1,628,203	-	171,008	-	171,008
2058	20,065,231	1,619,719	1,619,719	-	159,360	-	159,360
2059	20,029,726	1,608,421	1,608,421	-	148,242	-	148,242
2060	20,006,911	1,594,456	1,594,456	-	137,663	-	137,663
2061	20,001,139	1,577,600	1,577,600	-	127,595	-	127,595
2062	20,017,255	1,557,713	1,557,713	-	118,020	-	118,020
2063	20,060,579	1,534,125	1,534,125	-	108,883	-	108,883
2064	20,137,522	1,506,588	1,506,588	-	100,168	-	100,168
2065	20,255,140	1,475,481	1,475,481	-	91,896	-	91,896
2066	20,420,529	1,440,313	1,440,313	-	84,034	-	84,034
2067	20,641,764	1,401,219	1,401,219	-	76,583	-	76,583
2068	20,927,284	1,359,052	1,359,052	-	69,582	-	69,582
2069	21,285,156	1,314,429	1,314,429	-	63,042	-	63,042
2070	21,723,311	1,267,865	1,267,865	-	56,964	-	56,964
2071	22,249,631	1,219,555	1,219,555	-	51,329	-	51,329
2072	22,872,313	1,169,767	1,169,767	-	46,120	-	46,120

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)
2073	$ 23,599,807	$ 1,118,790	$ 1,118,790	$ -	$ 41,321	$ -	$ 41,321
2074	24,440,803	1,066,842	1,066,842	-	36,911	-	36,911
2075	25,404,338	1,014,078	1,014,078	-	32,867	-	32,867
2076	26,499,903	960,636	960,636	-	29,166	-	29,166
2077	27,737,487	906,680	906,680	-	25,787	-	25,787
2078	29,127,595	852,385	852,385	-	22,710	-	22,710
2079	30,681,271	797,969	797,969	-	19,916	-	19,916
2080	32,410,089	743,673	743,673	-	17,387	-	17,387
2081	34,326,171	689,762	689,762	-	15,107	-	15,107
2082	36,442,192	636,516	636,516	-	13,059	-	13,059
2083	38,771,408	584,229	584,229	-	11,229	-	11,229
2084	41,327,680	533,194	533,194	-	9,600	-	9,600
2085	44,125,514	483,705	483,705	-	8,158	-	8,158
2086	47,180,107	436,040	436,040	-	6,889	-	6,889
2087	50,507,409	390,458	390,458	-	5,779	-	5,779
2088	54,124,194	347,189	347,189	-	4,814	-	4,814
2089	58,048,147	306,427	306,427	-	3,980	-	3,980
2090	62,297,960	268,330	268,330	-	3,265	-	3,265
2091	66,893,441	233,014	233,014	-	2,656	-	2,656
2092	71,855,634	200,551	200,551	-	2,141	-	2,141
2093	77,206,946	170,970	170,970	-	1,710	-	1,710
2094	82,971,282	144,263	144,263	-	1,352	-	1,352
2095	89,174,190	120,385	120,385	-	1,057	-	1,057
2096	95,843,006	99,263	99,263	-	816	-	816
2097	103,007,010	80,792	80,792	-	622	-	622
2098	110,697,582	64,844	64,844	-	468	-	468
2099	118,948,378	51,266	51,266	-	346	-	346
2100	127,795,503	39,875	39,875	-	252	-	252
2101	137,277,709	30,484	30,484	-	181	-	181
2102	147,436,585	22,879	22,879	-	127	-	127
2103	158,316,765	16,838	16,838	-	88	-	88
2104	169,966,154	12,139	12,139	-	59	-	59
2105	182,436,144	8,564	8,564	-	39	-	39
2106	195,781,846	5,907	5,907	-	25	-	25
2107	210,062,332	3,982	3,982	-	16	-	16
2108	225,340,880	2,622	2,622	-	10	-	10
2109	241,685,237	1,688	1,688	-	6	-	6
2110	259,167,901	1,064	1,064	-	4	-	4
2111	277,866,409	659	659	-	2	-	2
2112	297,863,657	404	404	-	1	-	1
2113	319,248,243	246	246	-	1	-	1
2114	342,114,827	152	152	-	-	-	-
2115	366,564,530	97	97	-	-	-	-
2116	392,705,358	64	64	-	-	-	-
2117	420,652,660	46	46	-	-	-	-
2118	450,529,618	34	34	-	-	-	-
2119	482,467,771	27	27	-	-	-	-
2120	516,607,579	22	22	-	-	-	-
2121	553,099,028	18	18	-	-	-	-
2122	592,102,268	55	55	-	-	-	-
				Totals	$ 20,149,478	$ -	$ 20,149,478

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 (meets the statutory salary definition) and does not include pay above any pay cap.
Deferred Inflows and Outflows of Resources	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
Discount Rate or Single Discount Rate	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: 1) The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and; 2) The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.
Entry Age Actuarial Cost Method or Entry Age Normal (EAN)	The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit 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 experience in measurement of the Total Pension Liability 9. Recognition of Outflow (Inflow) of Resources due to assumption changes 10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments
Total Pension Liability (TPL)	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability (UAAL)	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	The valuation assets are the plan fiduciary net position used in determining the net pension liability of the fund. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.