Minnesota State Retirement System

State Employees Retirement Fund
GASB Statement Nos. 67 and 68
Accounting and Financial Reporting for Pensions
June 30, 2020

GRS

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November 30, 2020

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

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the State Employees Retirement Fund ("SERF"), as amended by 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 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 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 Statement No. 67 and No. 68 may produce significantly different results. The information in this report is calculated on a total plan basis. MSRS is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the Minnesota State Retirement System (MSRS) only in its entirety and only with the permission of MSRS. 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, 2020 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

This report does not fully reflect the recent and still developing 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. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

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.

The signing actuaries are independent of the plan sponsor.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Brian B. Murphy

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

Bonita J. Wurst

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

BBM/BJW:sc

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Section A

Executive Summary

Executive Summary
as of June 30, 2020 (Dollars in Thousands)

	2020
Actuarial Valuation Date	June 30, 2020
Measurement Date of the Net Pension Liability	June 30, 2020
Membership	
Number of	
- Service Retirements	37,898
- Survivors	4,237
- Disability Retirements	1,784
- Deferred Retirements	17,333
- Terminated other non-vested	9,670
- Active Members	51,742
- Total	122,664
Covered-employee Payroll	$ 3,298,283 [1]
Net Pension Liability	
Total Pension Liability	$ 15,183,843
Plan Fiduciary Net Position	13,855,691
Net Pension Liability	$ 1,328,152
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	91.25%
Net Pension Liability as a Percentage of Covered-employee Payroll	40.27%
Development of the Single Discount Rate	
Single Discount Rate	7.50%
Long-Term Expected Rate of Investment Return	7.50%
Long-Term Municipal Bond Rate	2.45% [2]
Last year ending June 30 in the 2021 to 2120 projection period for which projected benefit payments are fully funded	2120
Total Pension Expense/ (Income)	$ 318,623

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	$ 23,839	$ 13,637
Changes in assumptions	-	2,998,359
Net difference between projected and actual earnings on pension plan investments	374,634	311,289
Totals	$ 398,473	$ 3,323,285

[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 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 SERF subsequent to the measurement date of June 30, 2020.

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-2020 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 all actuarial assumptions are met (including the assumption of the plan earning 7.50%), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay 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 28 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, 2020 and a measurement date of June 30, 2020.

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 7.50%; the municipal bond rate is 2.45% (based on the weekly rate closest to but not later than the measurement date of the "20-Year Municipal GO AA Index" as published by Fidelity); and the resulting single discount rate is 7.50%.

SECTION B

FINANCIAL STATEMENTS

Statement of Pension Expense under GASB Statement No. 68
Fiscal Year Ended June 30, 2020 (Dollars in Thousands)

A. Expense/(Income)		
1. Service Cost	$	267,779
2. Interest on the Total Pension Liability		1,114,756
3. Current-Period Benefit Changes		-
4. Employee Contributions (made negative for addition here)		(197,897)
5. Projected Earnings on Plan Investments (made negative for addition here)		(1,014,687)
6. Pension Plan Administrative Expense		10,261
7. Other Changes in Plan Fiduciary Net Position		(21,332)
8. Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
Arising from Current Reporting Period		(2,596)
9. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Current Reporting Period		(93,122)
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		89,003
11. Increases/(Decreases) from Experience in the Current Reporting Period	**$**	**152,165**
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	$	17,183
13. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Prior Reporting Periods		200,206
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		(50,931)
15. Total Pension Expense/ (Income)	**$**	**318,623**

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 584,803 years. Additionally, the total plan membership (active employees and inactive employees) was 120,634. 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.

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, 2020 (Dollars in Thousands)

A. Outflows (Inflows) of Resources due to Liabilities	
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$ (12,979)
2. Assumption Changes (gains) or losses	(465,611)
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	(2,596)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	(93,122)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$ (95,718)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$ (10,383)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	(372,489)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$ (382,872)
B. Outflows (Inflows) of Resources due to Assets	
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$ 445,017
2. Recognition period for Assets {in years}	5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	89,003
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$ 356,014

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended June 30, 2020 (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	$ 2,001,072	$ 1,879,401	$ 121,671
2. Due to Assets	277,817	239,745	38,072
3. Total	$ 2,278,889	$ 2,119,146	$ 159,743

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

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Differences between expected and actual experience	$ 18,809	$ 4,222	$ 14,587
2. Assumption Changes	1,982,263	1,875,179	107,084
3. Net Difference between projected and actual earnings on pension plan investments	277,817	239,745	38,072
4. Total	$ 2,278,889	$ 2,119,146	$ 159,743

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	$ 23,839	$ 13,637	$ 10,202
2. Assumption Changes	-	2,998,359	(2,998,359)
3. Net Difference between projected and actual earnings on pension plan investments*	374,634	311,289	63,345
4. Total	$ 398,473	$ 3,323,285	$ (2,924,812)

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
2021	$ (2,009,371)
2022	(912,855)
2023	4,128
2024	(6,714)
2025	-
Thereafter	-
Total	$ (2,924,812)

** 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, 2020 (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					
2016	$ 21,209	5.0000	$ 4,241	$ 0	0.0000
2017	49,659	5.0000	9,932	9,931	1.0000
2018	(8,132)	5.0000	(1,626)	(3,254)	2.0000
2019	23,180	5.0000	4,636	13,908	3.0000
2020	(12,979)	5.0000	(2,596)	(10,383)	4.0000
Total			**$ 14,587**	**$ 10,202**	
Deferred Outflow (Inflow) Due to Assumption Changes					
2016	$ 9,911,319	5.0000	$ 1,982,263	$ 0	0.0000
2017	(4,691,209)	5.0000	(938,242)	(938,241)	1.0000
2018	(4,219,074)	5.0000	(843,815)	(1,687,629)	2.0000
2020	(465,611)	5.0000	(93,122)	(372,489)	4.0000
Total			**$ 107,084**	**$ (2,998,359)**	
Deferred Outflow (Inflow) Due to Differences Between Projected and Actual Earnings on Plan Investments					
2016	$ 913,038	5.0000	$ 182,607	$ 0	0.0000
2017	(841,021)	5.0000	(168,204)	(168,205)	1.0000
2018	(357,707)	5.0000	(71,541)	(143,084)	2.0000
2019	31,034	5.0000	6,207	18,620	3.0000
2020	445,017	5.0000	89,003	356,014	4.0000
Total			**$ 38,072**	**$ 63,345**	
Deferred Outflow (Inflow) due to All Sources					
Total			**$ 159,743**	**$ (2,924,812)**	

Statement of Fiduciary Net Position
as of June 30, 2020 (Dollars in Thousands)

Assets		June 30, 2020
Cash & Short-term Investments	$	594,685
Receivables		35,006
Investment Pools (at fair value)		13,219,462
Securities Lending Collateral		971,730
Capital Assets		14,718
Total Assets	**$**	**14,835,601**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(979,910)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**13,855,691**

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2020 (Dollars in Thousands)

1.	**Net Position at market value at beginning of year**	**$ 13,772,289**
Additions		
2.	Contributions	
	a. Employee	$ 197,897
	b. Employer	204,006
	c. Other sources	-
	d. Total contributions	$ 401,903
3.	Investment income	
	a. Investment income/(loss)	$ 582,401
	b. Investment expenses	(12,731)
	c. Net investment income/(loss)	$ 569,670
4.	Other Additions	21,355
5.	**Total Additions (2.d.) + (3.c.) + (4.)**	**$ 992,928**
Deductions		
6.	Benefits Paid	
	a. Annuity benefits	$ (885,517)
	b. Refunds	(13,725)
	c. Total benefits paid	$ (899,242)
7.	Expenses	
	a. Other deductions	$ (23)
	b. Administrative	(10,261)
	c. Total expenses	$ (10,284)
8.	**Total deductions (6.c.) + (7.c.)**	**$ (909,526)**
9.	**Net increase/(decrease) in fiduciary net position (5.) + (8.)**	**$ 83,402**
10.	**Net position at market value at end of year (1.) + (9.)**	**$ 13,855,691**
11.	State Board of Investment calculated annual investment return for the State Employees Retirement Fund*	4.2%

** The fiscal year 2020 investment return for the Combined Funds is 4.2%.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2020 (Dollars in Thousands)

A. Total pension liability		
1. Service Cost	$	267,779
2. Interest on the Total Pension Liability		1,114,756
3. Changes of benefit terms		-
4. Difference between expected and actual experience of the Total Pension Liability		(12,979)
5. Changes of assumptions		(465,611)
6. Benefit payments, including refunds of employee contributions		(899,242)
7. Net change in total pension liability	$	4,703
8. Total pension liability – beginning		15,179,140
9. Total pension liability – ending	**$**	**15,183,843**
B. Plan fiduciary net position		
1. Contributions – employer	$	204,006
2. Contributions – employee		197,897
3. Net investment income		569,670
4. Benefit payments, including refunds of employee contributions		(899,242)
5. Pension Plan Administrative Expense		(10,261)
6. Other changes		21,332
7. Net change in plan fiduciary net position	$	83,402
8. Plan fiduciary net position – beginning		13,772,289
9. Plan fiduciary net position – ending	**$**	**13,855,691**
C. Net pension liability, *A.9. - B.9.*	**$**	**1,328,152**
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9. / A.9.*		**91.25%**
E. Covered-employee payroll	**$**	**3,298,283** [1]
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**40.27%**

[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,	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Total Pension Liability										
Service Cost	$ 267,779	$ 255,056	$ 455,709	$ 619,666	$ 211,491	$ 210,545	$ 256,155			
Interest on the Total Pension Liability	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	(12,979)	23,180	(8,132)	49,659	21,209	(493,197)	(44,023)			
Assumption Changes	(465,611)	-	(4,219,074)	(4,691,209)	9,911,319	-	(1,477,308)			
Benefit Payments	(885,517)	(841,776)	(797,027)	(750,526)	(707,361)	(665,821)	(623,942)			
Refunds	(13,725)	(15,199)	(13,533)	(11,576)	(13,345)	(12,026)	(11,986)			
Net Change in Total Pension Liability	$ 4,703	$ 499,651	$ (5,224,031)	$ (3,718,430)	$10,444,238	$ 57,536	$ (978,923)			
Total Pension Liability - Beginning	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)	**$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	$ 204,006	$ 182,939	$ 164,233	$ 158,352	$ 151,168	$ 146,333	$ 128,037			
Employee Contributions	197,897	182,210	166,726	161,670	153,854	149,293	131,033			
Pension Plan Net Investment Income	569,670	948,366	1,276,550	1,667,562	(9,633)	501,185	1,829,621			
Benefit Payments	(885,517)	(841,776)	(797,027)	(750,526)	(707,361)	(665,821)	(623,942)			
Refunds	(13,725)	(15,199)	(13,533)	(11,576)	(13,345)	(12,026)	(11,986)			
Pension Plan Administrative Expense	(10,261)	(9,877)	(9,564)	(10,165)	(10,196)	(8,719)	(8,125)			
Other Changes	21,332	32,204	20,423	47,232	20,259	29,470	20,528			
Net Change in Plan Fiduciary Net Position	$ 83,402	$ 478,867	$ 807,808	$ 1,262,549	$ (415,254)	$ 139,715	$ 1,465,166			
Plan Fiduciary Net Position - Beginning	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)	**$13,855,691**	**$13,772,289**	**$13,293,422**	**$12,485,614**	**$11,223,065**	**$11,638,319**	**$11,498,604**			
Net Pension Liability - Ending (a) - (b)	**$ 1,328,152**	**$ 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	**91.25 %**	**90.73 %**	**90.56 %**	**62.73 %**	**47.51 %**	**88.32 %**	**87.64 %**			
Covered-Employee Payroll [(1)]	**$ 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	**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

Schedule of Contributions Multiyear (Dollars in Thousands)

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Actuarially Determined Contribution [1]	Actual Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll		Actual Contribution as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)		(b) / (d)
2011	$ 146,191	$ 118,563	$ 27,628	$ 2,440,580		4.86%
2012	142,740	115,159	27,581	2,367,160	[2]	4.86
2013	181,756	121,673	60,083	2,483,000	[2]	4.90
2014	195,239	128,037	67,202	2,620,660	[2]	4.89
2015	198,695	146,333	52,362	2,714,418	[2]	5.39
2016	194,136	151,168	42,968	2,797,345	[2]	5.40
2017	264,257	158,352	105,905	2,939,455	[2]	5.39
2018	234,629	164,233	70,396	3,031,382	[2]	5.42
2019	183,161	182,939	222	3,168,870	[2]	5.77
2020	184,044	204,006	(19,962)	3,298,283	[2]	6.19

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Fiscal Year Ending June 30, 2020 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, 2019
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	29 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.50%
Payroll Growth	3.25%
Salary Increases	Service based table of rates ranging from 13.75% with one year of service to 3.25% with 25 or more years of service, including inflation
Investment Rate of Return	7.50%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition.
Healthy Post-retirement Mortality	RP-2014 annuitant generational mortality table, projected with mortality improvement scale MP-2015 from a base year of 2014, white collar adjustment, set forward 2-years for males and no age adjustment for females.
Other Information	
Benefit Increases After Retirement	The post-retirement increase is 1.00% from January 1, 2019 through December 31, 2023, and 1.50% from January 1, 2024 and onward. See separate funding actuarial valuation report as of July 1, 2019 for additional detail. To obtain this report, contact MSRS at 60 Empire Drive, Suite 300, St. Paul, Minnesota, 55103 or request via email at info@msrs.us or telephone at 1.800.651.5757. This report can be found online at www.msrs.state.mn.us/annual-reports-fy-2019.

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]	
2011		
2012		
2013		
2014	18.7	%
2015	4.5	
2016	-0.1	
2017	15.2	
2018	10.5	
2019	7.3	
2020	4.2	

[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, 2020, the annual money-weighted rate of return for the State Employees Retirement Fund was 4.2%. 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, 2020, these estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric Mean)
Domestic Equity	36%	5.10%
International Equity	17%	5.30%
Private Markets	25%	5.90%
Fixed Income	20%	0.75%
Cash	2%	0.00%
Total	100%	

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

For purposes of this valuation, the long-term expected rate of return assumption is 7.50%. This assumption is based on a review of inflation and investment return assumptions in our experience study report dated June 27, 2019.

Single Discount Rate

A Single Discount Rate of 7.50% was used to measure the total pension liability. This Single Discount Rate was based on an expected rate of return on pension plan investments of 7.50%. 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 7.50%, as well as what the fund's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower (6.50%) or 1-percentage-point higher (8.50%) than the current rate.

Sensitivity of Net Pension Liability
to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 6.50%	Current Single Discount Rate Assumption 7.50%	1% Increase 8.50%
Total Pension Liability	$ 17,008,304	$ 15,183,843	$ 13,665,456
Net Position Restricted for Pensions	13,855,691	13,855,691	13,855,691
Net Pension Liability	**$ 3,152,613**	**$ 1,328,152**	**$ (190,235)**

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

Note that we believe the 8.5% interest rate assumption would 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	**$ 15,179,140**	**$ 13,772,289**	**$ 1,406,851**	**$ 2,232,345**	**$ 4,963,841**	
Changes for the Year:						
Service Cost	$ 267,779		$ 267,779			$ 267,779
Interest on Total Pension Liability	1,114,756		1,114,756			1,114,756
Interest on Fiduciary Net Position		$ 1,014,687 [1]	(1,014,687)			(1,014,687)
Changes in Benefit Terms	-		-			-
Liability Experience Gains and Losses	(12,979)		(12,979)	$ -	$ 10,383	(2,596)
Changes in Assumptions	(465,611)		(465,611)	-	372,489	(93,122)
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(18,809)	(1,626)	17,183
Assumption Changes				(1,982,263)	(1,782,057)	200,206
Investment Gains/(Losses)				(188,814)	(239,745)	(50,931)
Contributions - Employer		204,006	(204,006)			
Contributions - Employees		197,897	(197,897)			(197,897)
Asset Gain/(Loss)		(445,017) [1]	445,017	356,014	-	89,003
Benefit Payments and Refunds	(899,242)	(899,242)	-			
Administrative Expenses		(10,261)	10,261			10,261
Other changes		21,332	(21,332)			(21,332)
Net Changes	**$ 4,703**	**$ 83,402**	**$ (78,699)**	**$ (1,833,872)**	**$ (1,640,556)**	**$ 318,623**
Balance End of Year	**$ 15,183,843**	**$ 13,855,691**	**$ 1,328,152**	**$ 398,473**	**$ 3,323,285**	

(1) The sum of these items in column (b) equals the net investment income of $569,670.

Summary of Population Statistics

		Terminated*		Recipients**			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on July 1, 2019	**51,997**	**17,154**	**9,110**	**36,432**	**1,801**	**4,140**	**120,634**
New members	5,270	0	0	0	0	0	**5,270**
Return to active	338	(163)	(175)	0	0	0	**0**
Terminated non-vested	(2,288)	0	2,288	0	0	0	**0**
Service retirements	(1,507)	(843)	0	2,350	0	0	**0**
Unclassified retirements	0	0	0	52	0	0	**52**
Terminated deferred	(1,178)	1,178	0	0	0	0	**0**
Terminated refund/transfer	(782)	(152)	(1,918)	0	0	0	**(2,852)**
Deaths	(58)	(36)	(16)	(984)	(75)	(220)	**(1,389)**
New beneficiary	0	0	0	0	0	341	**341**
Disabled	(36)	0	0	0	36	0	**0**
Data adjustments	(14)	195	381	48	22	(24)	**608**
Net change	(255)	179	560	1,466	(17)	97	**2,030**
Members on July 1, 2020	**51,742**	**17,333**	**9,670**	**37,898**	**1,784**	**4,237**	**122,664**

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

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

SECTION E

SUMMARY OF BENEFITS

Summary of Plan Provisions

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

Plan Year — July 1 through June 30.

Eligibility — State employees, non-academic staff of the University of Minnesota and employees of certain Metro level government units, unless excluded by law.

Contributions — Shown as a percent of salary:

Effective 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)	
<u>Early retirement</u>	
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.
<u>Form of payment</u>	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.
<u>Benefit increases</u>	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

<u>Surviving spouse optional benefit</u>

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.

<u>Surviving dependent children's benefit</u>

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

<u>Refund of contributions</u>

Age/Service requirement	Active member dies and survivor benefits are not payable or a former member dies before annuity begins or former member who is not entitled to an annuity dies.
Amount	Member's contributions with 6.00% interest through June 30, 2011. 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%. The actuarially equivalent factors are currently being updated to reflect changes adopted during the 2018 legislative session.
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. The Allowance for Combined Service Annuity assumptions are based on an analysis completed by the LCPR actuary and documented in a report dated October 2016.

Investment return	7.50% per annum.
Single discount rate	7.50% 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	Account balances accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit are assumed to take the larger of the contributions accumulated with interest or the value of the deferred benefit.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at normal retirement age.
Percentage married	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.

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:

Data for active members:

There were 114 members reported with zero or invalid salary (<$100). We used prior year salary (63 members), if available, otherwise, high five salary with a 10% load to account for salary increases (50 members). If neither pay or high five salary was available, we assumed a value of $45,000 (1 member).

There were 2 members reported with zero or negative service. Due to the small number of members with zero service, and based on direction from MSRS, we used service of 0 years for these members.

There were also 101 members reported without a gender and no members reported with an invalid date of birth. We assumed female gender.

Data for terminated members:

There were 350 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 (345 members), we assumed a value of $40,000. If termination date was not reported (3 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 (2 members), we assumed a value of 5.0 years.

There were no members with a missing date of birth or an invalid gender.

Data for members receiving benefits:

There were 40 members reported without a gender. We assumed female gender for the valuation. No retired members were reported with an invalid date of birth.

There were 5 members reported without a benefit. Due to the small number of members with missing benefits, we made no adjustment to the reported data for members receiving benefits.

There were 12 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 103 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)	<u>Data for members receiving benefits:</u> There were 93 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 (3,558 members) and/or survivor date of birth (3,069 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.
Changes in actuarial assumptions	The price inflation assumption was decreased from 2.50% to 2.25%. The payroll growth assumption was decreased from 3.25% to 3.00%. Assumed salary increase rates were changed as recommended in the June 30, 2019 experience study. The net effect is proposed rates that average 0.25% less than the previous rates. Assumed rates of retirement were changed as recommended in the June 30, 2019 experience study. The changes result in more unreduced (normal) retirements, fewer Rule of 90 retirements and fewer early retirements. Assumed rates of termination were changed as recommended in the June 30, 2019 experience study. The new rates are based on service and are generally lower than the previous rates for years 1 – 5 and slightly higher thereafter. Assumed rates of disability were changed as recommended in the June 30, 2019 experience study. The change results in fewer predicted disability retirements for males and females. The base mortality table for healthy annuitants and employees was changed from the RP-2014 table to the Pub-2010 General Mortality table, with adjustments. The mortality improvement scale was changed from Scale MP-2015 to Scale MP-2018. The base mortality table for disabled annuitants was changed from the RP-2014 disabled annuitant mortality table (with future mortality improvement according to Scale MP-2015) to the Pub-2010 General/Teacher disabled annuitant mortality table (with future mortality improvement according to Scale MP-2018), with adjustments. The percent married assumption for female members was changed from 65% to 60%. The assumed age difference was changed from three years younger for males to 2 years younger. The assumed number of married male new retirees electing the 50% and 100% Joint & Survivor options changed from 15% to 10% and from 30% to 65%, respectively. The assumed number of married female new retirees electing the 100% Joint & Survivor option changed from 30% to 40%. The corresponding number of married new retirees electing the Life annuity option was adjusted accordingly.

Summary of Actuarial Assumptions (Continued)

	Percent of Members Dying Each Year*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality**	
Age in 2020	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%	0.67%	0.79%
40	0.08%	0.04%	0.07%	0.04%	0.88%	1.10%
45	0.11%	0.07%	0.09%	0.06%	1.19%	1.44%
50	0.28%	0.23%	0.13%	0.08%	1.66%	1.67%
55	0.43%	0.33%	0.21%	0.14%	2.21%	2.05%
60	0.66%	0.45%	0.32%	0.21%	2.77%	2.38%
65	0.96%	0.65%	0.46%	0.30%	3.39%	2.75%
70	1.49%	1.06%	0.64%	0.47%	4.09%	3.62%
75	2.52%	1.88%	0.97%	0.78%	5.38%	5.46%
80	4.51%	3.45%	1.53%	1.32%	7.79%	8.71%
85	8.22%	6.48%	6.44%	5.36%	11.59%	12.97%
90	14.19%	12.00%	13.24%	11.57%	17.79%	18.33%

* *Generally, mortality rates are expected to increase as age increases. These standard mortality rates have been adjusted slightly to prevent decreasing mortality rates. 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 7.50%; the municipal bond rate is 2.45% (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, 2020 is 7.50%.** In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.

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

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

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

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

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

	Projected Covered-Employee Payroll			Projected Contributions			
Fiscal Year Ending	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) * 6.0%	(e) = (a) * 6.25%	(f)	(g) = (d) + (e) + (f)
2020	$ 3,298,283		$ 3,298,283				
2021	3,234,005	$ 90,805	3,324,810	$ 194,040	$ 202,125	$ 3,587	$ 399,752
2022	3,060,124	364,431	3,424,555	183,607	191,258	14,395	389,260
2023	2,898,324	628,967	3,527,291	173,899	181,145	24,844	379,888
2024	2,765,796	867,314	3,633,110	165,948	172,862	34,259	373,069
2025	2,643,361	1,098,742	3,742,103	158,602	165,210	43,400	367,212
2026	2,530,447	1,323,919	3,854,366	151,827	158,153	52,295	362,275
2027	2,425,638	1,544,359	3,969,997	145,538	151,602	61,002	358,142
2028	2,327,037	1,762,060	4,089,097	139,622	145,440	69,601	354,663
2029	2,233,573	1,978,197	4,211,770	134,014	139,598	78,139	351,751
2030	2,143,751	2,194,372	4,338,123	128,625	133,984	86,678	349,287
2031	2,057,111	2,411,156	4,468,267	123,427	128,569	95,241	347,237
2032	1,973,574	2,628,741	4,602,315	118,414	123,348	103,835	345,597
2033	1,892,676	2,847,709	4,740,385	113,561	118,292	112,484	344,337
2034	1,813,740	3,068,856	4,882,596	108,824	113,359	121,220	343,403
2035	1,736,281	3,292,793	5,029,074	104,177	108,518	130,065	342,760
2036	1,660,043	3,519,903	5,179,946	99,603	103,753	139,036	342,392
2037	1,585,490	3,749,855	5,335,345	95,129	99,093	148,119	342,341
2038	1,512,986	3,982,419	5,495,405	90,779	94,562	157,306	342,647
2039	1,441,688	4,218,579	5,660,267	86,501	90,105	166,634	343,240
2040	1,370,190	4,459,885	5,830,075	82,211	85,637	176,165	344,013
2041	1,297,475	4,707,502	6,004,977	77,848	81,092	185,946	344,886
2042	1,223,727	4,961,400	6,185,127	73,424	76,483	195,975	345,882
2043	1,149,817	5,220,863	6,370,680	68,989	71,864	206,224	347,077
2044	1,075,505	5,486,296	6,561,801	64,530	67,219	216,709	348,458
2045	1,000,002	5,758,653	6,758,655	60,000	62,500	227,467	349,967
2046	923,175	6,038,240	6,961,415	55,390	57,698	238,510	351,598
2047	845,863	6,324,394	7,170,257	50,752	52,866	249,814	353,432
2048	769,378	6,615,987	7,385,365	46,163	48,086	261,331	355,580
2049	694,146	6,912,780	7,606,926	41,649	43,384	273,055	358,088
2050	620,427	7,214,706	7,835,133	37,226	38,777	284,981	360,984
2051	548,929	7,521,258	8,070,187	32,936	34,308	297,090	364,334
2052	480,750	7,831,543	8,312,293	28,845	30,047	309,346	368,238
2053	416,530	8,145,132	8,561,662	24,992	26,033	321,733	372,758
2054	356,876	8,461,636	8,818,512	21,413	22,305	334,235	377,953
2055	301,925	8,781,142	9,083,067	18,115	18,870	346,855	383,840
2056	251,534	9,104,025	9,355,559	15,092	15,721	359,609	390,422
2057	206,186	9,430,040	9,636,226	12,371	12,887	372,487	397,745
2058	166,067	9,759,246	9,925,313	9,964	10,379	385,490	405,833
2059	130,899	10,092,173	10,223,072	7,854	8,181	398,641	414,676
2060	100,695	10,429,069	10,529,764	6,042	6,293	411,948	424,283
2061	75,333	10,770,324	10,845,657	4,520	4,708	425,428	434,656
2062	54,563	11,116,464	11,171,027	3,274	3,410	439,100	445,784
2063	38,179	11,467,978	11,506,157	2,291	2,386	452,985	457,662
2064	25,670	11,825,672	11,851,342	1,540	1,604	467,114	470,258
2065	16,546	12,190,336	12,206,882	993	1,034	481,518	483,545
2066	10,158	12,562,931	12,573,089	609	635	496,236	497,480
2067	5,758	12,944,524	12,950,282	345	360	511,309	512,014
2068	2,815	13,335,975	13,338,790	169	176	526,771	527,116
2069	1,180	13,737,774	13,738,954	71	74	542,642	542,787
2070	486	14,150,636	14,151,122	29	30	558,950	559,009

* *Equal to total contributions (12.25% of payroll for new employees) net of normal cost and expenses (8.30% of payroll).*

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

	Projected Covered-Employee Payroll			Projected Contributions			
Fiscal Year Ending	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward current UAL*	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d) = (a) * 6.0%	(e) = (a) * 6.25%	(f)	(g) = (d) + (e) + (f)
2071	$ 197	$ 14,575,459	$ 14,575,656	$ 12	$ 12	$ 575,731	$ 575,755
2072	58	15,012,868	15,012,926	4	4	593,008	593,016
2073	10	15,463,304	15,463,314	1	1	610,800	610,802
2074	2	15,927,211	15,927,213	-	-	629,125	629,125
2075	-	16,405,029	16,405,029	-	-	647,999	647,999
2076	-	16,897,180	16,897,180	-	-	667,439	667,439
2077	-	17,404,096	17,404,096	-	-	687,462	687,462
2078	-	17,926,218	17,926,218	-	-	708,086	708,086
2079	-	18,464,005	18,464,005	-	-	729,328	729,328
2080	-	19,017,925	19,017,925	-	-	751,208	751,208
2081	-	19,588,463	19,588,463	-	-	773,744	773,744
2082	-	20,176,117	20,176,117	-	-	796,957	796,957
2083	-	20,781,400	20,781,400	-	-	820,865	820,865
2084	-	21,404,842	21,404,842	-	-	845,491	845,491
2085	-	22,046,988	22,046,988	-	-	870,856	870,856
2086	-	22,708,397	22,708,397	-	-	896,982	896,982
2087	-	23,389,649	23,389,649	-	-	923,891	923,891
2088	-	24,091,339	24,091,339	-	-	951,608	951,608
2089	-	24,814,079	24,814,079	-	-	980,156	980,156
2090	-	25,558,501	25,558,501	-	-	1,009,561	1,009,561
2091	-	26,325,256	26,325,256	-	-	1,039,848	1,039,848
2092	-	27,115,014	27,115,014	-	-	1,071,043	1,071,043
2093	-	27,928,464	27,928,464	-	-	1,103,174	1,103,174
2094	-	28,766,318	28,766,318	-	-	1,136,270	1,136,270
2095	-	29,629,308	29,629,308	-	-	1,170,358	1,170,358
2096	-	30,518,187	30,518,187	-	-	1,205,468	1,205,468
2097	-	31,433,733	31,433,733	-	-	1,241,632	1,241,632
2098	-	32,376,745	32,376,745	-	-	1,278,881	1,278,881
2099	-	33,348,047	33,348,047	-	-	1,317,248	1,317,248
2100	-	34,348,488	34,348,488	-	-	1,356,765	1,356,765
2101	-	35,378,943	35,378,943	-	-	1,397,468	1,397,468
2102	-	36,440,311	36,440,311	-	-	1,439,392	1,439,392
2103	-	37,533,521	37,533,521	-	-	1,482,574	1,482,574
2104	-	38,659,526	38,659,526	-	-	1,527,051	1,527,051
2105	-	39,819,312	39,819,312	-	-	1,572,863	1,572,863
2106	-	41,013,891	41,013,891	-	-	1,620,049	1,620,049
2107	-	42,244,308	42,244,308	-	-	1,668,650	1,668,650
2108	-	43,511,637	43,511,637	-	-	1,718,710	1,718,710
2109	-	44,816,986	44,816,986	-	-	1,770,271	1,770,271
2110	-	46,161,496	46,161,496	-	-	1,823,379	1,823,379
2111	-	47,546,341	47,546,341	-	-	1,878,080	1,878,080
2112	-	48,972,731	48,972,731	-	-	1,934,423	1,934,423
2113	-	50,441,913	50,441,913	-	-	1,992,456	1,992,456
2114	-	51,955,170	51,955,170	-	-	2,052,229	2,052,229
2115	-	53,513,826	53,513,826	-	-	2,113,796	2,113,796
2116	-	55,119,240	55,119,240	-	-	2,177,210	2,177,210
2117	-	56,772,818	56,772,818	-	-	2,242,526	2,242,526
2118	-	58,476,002	58,476,002	-	-	2,309,802	2,309,802
2119	-	60,230,282	60,230,282	-	-	2,379,096	2,379,096
2120	-	62,037,191	62,037,191	-	-	2,450,469	2,450,469

* *Equal to total contributions (12.25% of payroll for new employees) net of normal cost and expenses (8.30% 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 7.50%	Projected Ending Plan Fiduciary Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2021	$ 13,855,691	$ 399,752	$ 943,573	$ 10,025	$ 1,018,783	$ 14,320,627
2022	14,320,627	389,260	987,793	9,486	1,051,659	14,764,267
2023	14,764,267	379,888	1,029,417	8,985	1,083,072	15,188,826
2024	15,188,826	373,069	1,067,195	8,574	1,113,287	15,599,413
2025	15,599,413	367,212	1,106,637	8,194	1,142,427	15,994,221
2026	15,994,221	362,275	1,147,270	7,844	1,170,373	16,371,754
2027	16,371,754	358,142	1,185,716	7,519	1,197,132	16,733,794
2028	16,733,794	354,663	1,222,321	7,214	1,222,820	17,081,742
2029	17,081,742	351,751	1,256,251	6,924	1,247,570	17,417,888
2030	17,417,888	349,287	1,287,658	6,646	1,271,544	17,744,416
2031	17,744,416	347,237	1,316,827	6,377	1,294,894	18,063,343
2032	18,063,343	345,597	1,343,967	6,118	1,317,763	18,376,619
2033	18,376,619	344,337	1,368,418	5,867	1,340,322	18,686,993
2034	18,686,993	343,403	1,391,140	5,623	1,362,738	18,996,371
2035	18,996,371	342,760	1,412,154	5,382	1,385,152	19,306,748
2036	19,306,748	342,392	1,432,431	5,146	1,407,679	19,619,241
2037	19,619,241	342,341	1,450,670	4,915	1,430,451	19,936,448
2038	19,936,448	342,647	1,466,108	4,690	1,453,693	20,261,989
2039	20,261,989	343,240	1,478,461	4,469	1,477,683	20,599,982
2040	20,599,982	344,013	1,488,714	4,248	1,502,692	20,953,726
2041	20,953,726	344,886	1,498,243	4,022	1,528,912	21,325,260
2042	21,325,260	345,882	1,506,758	3,794	1,556,509	21,717,099
2043	21,717,099	347,077	1,513,811	3,564	1,585,690	22,132,490
2044	22,132,490	348,458	1,519,567	3,334	1,616,691	22,574,739
2045	22,574,739	349,967	1,525,153	3,100	1,649,718	23,046,171
2046	23,046,171	351,598	1,531,035	2,862	1,684,928	23,548,802
2047	23,548,802	353,432	1,536,904	2,622	1,722,486	24,085,193
2048	24,085,193	355,580	1,542,000	2,385	1,762,615	24,659,004
2049	24,659,004	358,088	1,546,345	2,152	1,805,592	25,274,187
2050	25,274,187	360,984	1,550,147	1,923	1,851,706	25,934,806
2051	25,934,806	364,334	1,553,076	1,702	1,901,276	26,645,637
2052	26,645,637	368,238	1,554,584	1,490	1,954,684	27,412,485
2053	27,412,485	372,758	1,554,171	1,291	2,012,387	28,242,167
2054	28,242,167	377,953	1,551,524	1,106	2,074,908	29,142,396
2055	29,142,396	383,840	1,546,508	936	2,142,833	30,121,626
2056	30,121,626	390,422	1,539,493	780	2,216,782	31,188,557
2057	31,188,557	397,745	1,530,004	639	2,297,426	32,353,084
2058	32,353,084	405,833	1,517,269	515	2,385,537	33,626,671
2059	33,626,671	414,676	1,501,750	406	2,481,957	35,021,148
2060	35,021,148	424,283	1,483,539	312	2,587,571	36,549,150
2061	36,549,150	434,656	1,461,974	234	2,703,350	38,224,948
2062	38,224,948	445,784	1,436,762	169	2,830,375	40,064,176
2063	40,064,176	457,662	1,407,975	118	2,969,816	42,083,561
2064	42,083,561	470,258	1,374,896	80	3,122,954	44,301,798
2065	44,301,798	483,545	1,337,660	51	3,291,183	46,738,815
2066	46,738,815	497,480	1,297,573	31	3,475,949	49,414,640
2067	49,414,640	512,014	1,255,551	18	3,678,719	52,349,803
2068	52,349,803	527,116	1,211,914	9	3,901,019	55,566,016
2069	55,566,016	542,787	1,166,776	4	4,144,474	59,086,497
2070	59,086,497	559,009	1,120,420	2	4,410,815	62,935,900

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

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

Fiscal Year Ending	Projected Beginning Plan Net Fiduciary Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.50%	Projected Ending Plan Fiduciary Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2071	$ 62,935,900	$ 575,755	$ 1,073,178	$ 1	$ 4,701,876	$ 67,140,353
2072	67,140,353	593,016	1,025,204	-	5,019,612	71,727,777
2073	71,727,777	610,802	976,538	-	5,366,116	76,728,157
2074	76,728,157	629,125	927,249	-	5,743,634	82,173,667
2075	82,173,667	647,999	877,430	-	6,154,577	88,098,813
2076	88,098,813	667,439	827,186	-	6,601,529	94,540,594
2077	94,540,594	687,462	776,659	-	7,087,260	101,538,658
2078	101,538,658	708,086	726,023	-	7,614,739	109,135,459
2079	109,135,459	729,328	675,490	-	8,187,142	117,376,438
2080	117,376,438	751,208	625,298	-	8,807,869	126,310,218
2081	126,310,218	773,744	575,707	-	9,480,559	135,988,814
2082	135,988,814	796,957	526,993	-	10,209,102	146,467,879
2083	146,467,879	820,865	479,443	-	10,997,663	157,806,965
2084	157,806,965	845,491	433,339	-	11,850,699	170,069,815
2085	170,069,815	870,856	388,961	-	12,772,981	183,324,691
2086	183,324,691	896,982	346,570	-	13,769,619	197,644,722
2087	197,644,722	923,891	306,400	-	14,846,091	213,108,305
2088	213,108,305	951,608	268,654	-	16,008,271	229,799,530
2089	229,799,530	980,156	233,497	-	17,262,458	247,808,647
2090	247,808,647	1,009,561	201,050	-	18,615,420	267,232,577
2091	267,232,577	1,039,848	171,389	-	20,074,422	288,175,457
2092	288,175,457	1,071,043	144,545	-	21,647,275	310,749,230
2093	310,749,230	1,103,174	120,505	-	23,342,376	335,074,276
2094	335,074,276	1,136,270	99,216	-	25,168,757	361,280,086
2095	361,280,086	1,170,358	80,594	-	27,136,134	389,505,984
2096	389,505,984	1,205,468	64,522	-	29,254,961	419,901,891
2097	419,901,891	1,241,632	50,852	-	31,536,489	452,629,160
2098	452,629,160	1,278,881	39,409	-	33,992,827	487,861,459
2099	487,861,459	1,317,248	29,993	-	36,637,009	525,785,722
2100	525,785,722	1,356,765	22,389	-	39,483,064	566,603,162
2101	566,603,162	1,397,468	16,371	-	42,546,092	610,530,352
2102	610,530,352	1,439,392	11,709	-	45,842,347	657,800,381
2103	657,800,381	1,482,574	8,181	-	49,389,319	708,664,093
2104	708,664,093	1,527,051	5,576	-	53,205,831	763,391,399
2105	763,391,399	1,572,863	3,703	-	57,312,135	822,272,694
2106	822,272,694	1,620,049	2,392	-	61,730,017	885,620,368
2107	885,620,368	1,668,650	1,502	-	66,482,915	953,770,432
2108	953,770,432	1,718,710	915	-	71,596,035	1,027,084,261
2109	1,027,084,261	1,770,271	541	-	77,096,485	1,105,950,476
2110	1,105,950,476	1,823,379	310	-	83,013,415	1,190,786,960
2111	1,190,786,960	1,878,080	172	-	89,378,170	1,282,043,038
2112	1,282,043,038	1,934,423	93	-	96,224,454	1,380,201,822
2113	1,380,201,822	1,992,456	48	-	103,588,501	1,485,782,730
2114	1,485,782,730	2,052,229	25	-	111,509,271	1,599,344,206
2115	1,599,344,206	2,113,796	12	-	120,028,649	1,721,486,640
2116	1,721,486,640	2,177,210	6	-	129,191,667	1,852,855,511
2117	1,852,855,511	2,242,526	3	-	139,046,738	1,994,144,773
2118	1,994,144,773	2,309,802	1	-	149,645,910	2,146,100,483
2119	2,146,100,483	2,379,096	-	-	161,045,139	2,309,524,718
2120	2,309,524,718	2,450,469	-	-	173,304,585	2,485,279,772

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

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

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)
2021	$ 13,855,691	$ 943,573	$ 943,573	$ -	$ 910,063	$ -	$ 910,063
2022	14,320,627	987,793	987,793	-	886,244	-	886,244
2023	14,764,267	1,029,417	1,029,417	-	859,152	-	859,152
2024	15,188,826	1,067,195	1,067,195	-	828,541	-	828,541
2025	15,599,413	1,106,637	1,106,637	-	799,221	-	799,221
2026	15,994,221	1,147,270	1,147,270	-	770,760	-	770,760
2027	16,371,754	1,185,716	1,185,716	-	741,013	-	741,013
2028	16,733,794	1,222,321	1,222,321	-	710,594	-	710,594
2029	17,081,742	1,256,251	1,256,251	-	679,367	-	679,367
2030	17,417,888	1,287,658	1,287,658	-	647,769	-	647,769
2031	17,744,416	1,316,827	1,316,827	-	616,226	-	616,226
2032	18,063,343	1,343,967	1,343,967	-	585,048	-	585,048
2033	18,376,619	1,368,418	1,368,418	-	554,132	-	554,132
2034	18,686,993	1,391,140	1,391,140	-	524,030	-	524,030
2035	18,996,371	1,412,154	1,412,154	-	494,834	-	494,834
2036	19,306,748	1,432,431	1,432,431	-	466,920	-	466,920
2037	19,619,241	1,450,670	1,450,670	-	439,875	-	439,875
2038	19,936,448	1,466,108	1,466,108	-	413,540	-	413,540
2039	20,261,989	1,478,461	1,478,461	-	387,930	-	387,930
2040	20,599,982	1,488,714	1,488,714	-	363,368	-	363,368
2041	20,953,726	1,498,243	1,498,243	-	340,180	-	340,180
2042	21,325,260	1,506,758	1,506,758	-	318,245	-	318,245
2043	21,717,099	1,513,811	1,513,811	-	297,428	-	297,428
2044	22,132,490	1,519,567	1,519,567	-	277,729	-	277,729
2045	22,574,739	1,525,153	1,525,153	-	259,302	-	259,302
2046	23,046,171	1,531,035	1,531,035	-	242,142	-	242,142
2047	23,548,802	1,536,904	1,536,904	-	226,111	-	226,111
2048	24,085,193	1,542,000	1,542,000	-	211,034	-	211,034
2049	24,659,004	1,546,345	1,546,345	-	196,863	-	196,863
2050	25,274,187	1,550,147	1,550,147	-	183,579	-	183,579
2051	25,934,806	1,553,076	1,553,076	-	171,094	-	171,094
2052	26,645,637	1,554,584	1,554,584	-	159,312	-	159,312
2053	27,412,485	1,554,171	1,554,171	-	148,158	-	148,158
2054	28,242,167	1,551,524	1,551,524	-	137,586	-	137,586
2055	29,142,396	1,546,508	1,546,508	-	127,573	-	127,573
2056	30,121,626	1,539,493	1,539,493	-	118,135	-	118,135
2057	31,188,557	1,530,004	1,530,004	-	109,215	-	109,215
2058	32,353,084	1,517,269	1,517,269	-	100,750	-	100,750
2059	33,626,671	1,501,750	1,501,750	-	92,762	-	92,762
2060	35,021,148	1,483,539	1,483,539	-	85,244	-	85,244
2061	36,549,150	1,461,974	1,461,974	-	78,144	-	78,144
2062	38,224,948	1,436,762	1,436,762	-	71,439	-	71,439
2063	40,064,176	1,407,975	1,407,975	-	65,123	-	65,123
2064	42,083,561	1,374,896	1,374,896	-	59,156	-	59,156
2065	44,301,798	1,337,660	1,337,660	-	53,539	-	53,539
2066	46,738,815	1,297,573	1,297,573	-	48,311	-	48,311
2067	49,414,640	1,255,551	1,255,551	-	43,485	-	43,485
2068	52,349,803	1,211,914	1,211,914	-	39,045	-	39,045
2069	55,566,016	1,166,776	1,166,776	-	34,968	-	34,968
2070	59,086,497	1,120,420	1,120,420	-	31,236	-	31,236

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)
2071	$ 62,935,900	$ 1,073,178	$ 1,073,178	$ -	$ 27,832	$ -	$ 27,832
2072	67,140,353	1,025,204	1,025,204	-	24,733	-	24,733
2073	71,727,777	976,538	976,538	-	21,915	-	21,915
2074	76,728,157	927,249	927,249	-	19,357	-	19,357
2075	82,173,667	877,430	877,430	-	17,039	-	17,039
2076	88,098,813	827,186	827,186	-	14,943	-	14,943
2077	94,540,594	776,659	776,659	-	13,051	-	13,051
2078	101,538,658	726,023	726,023	-	11,349	-	11,349
2079	109,135,459	675,490	675,490	-	9,823	-	9,823
2080	117,376,438	625,298	625,298	-	8,458	-	8,458
2081	126,310,218	575,707	575,707	-	7,244	-	7,244
2082	135,988,814	526,993	526,993	-	6,169	-	6,169
2083	146,467,879	479,443	479,443	-	5,220	-	5,220
2084	157,806,965	433,339	433,339	-	4,389	-	4,389
2085	170,069,815	388,961	388,961	-	3,665	-	3,665
2086	183,324,691	346,570	346,570	-	3,038	-	3,038
2087	197,644,722	306,400	306,400	-	2,498	-	2,498
2088	213,108,305	268,654	268,654	-	2,038	-	2,038
2089	229,799,530	233,497	233,497	-	1,647	-	1,647
2090	247,808,647	201,050	201,050	-	1,320	-	1,320
2091	267,232,577	171,389	171,389	-	1,046	-	1,046
2092	288,175,457	144,545	144,545	-	821	-	821
2093	310,749,230	120,505	120,505	-	637	-	637
2094	335,074,276	99,216	99,216	-	488	-	488
2095	361,280,086	80,594	80,594	-	368	-	368
2096	389,505,984	64,522	64,522	-	274	-	274
2097	419,901,891	50,852	50,852	-	201	-	201
2098	452,629,160	39,409	39,409	-	145	-	145
2099	487,861,459	29,993	29,993	-	103	-	103
2100	525,785,722	22,389	22,389	-	71	-	71
2101	566,603,162	16,371	16,371	-	48	-	48
2102	610,530,352	11,709	11,709	-	32	-	32
2103	657,800,381	8,181	8,181	-	21	-	21
2104	708,664,093	5,576	5,576	-	13	-	13
2105	763,391,399	3,703	3,703	-	8	-	8
2106	822,272,694	2,392	2,392	-	5	-	5
2107	885,620,368	1,502	1,502	-	3	-	3
2108	953,770,432	915	915	-	2	-	2
2109	1,027,084,261	541	541	-	1	-	1
2110	1,105,950,476	310	310	-	-	-	-
2111	1,190,786,960	172	172	-	-	-	-
2112	1,282,043,038	93	93	-	-	-	-
2113	1,380,201,822	48	48	-	-	-	-
2114	1,485,782,730	25	25	-	-	-	-
2115	1,599,344,206	12	12	-	-	-	-
2116	1,721,486,640	6	6	-	-	-	-
2117	1,852,855,511	3	3	-	-	-	-
2118	1,994,144,773	1	1	-	-	-	-
2119	2,146,100,483	-	-	-	-	-	-
2120	2,309,524,718	-	-	-	-	-	-
				Totals	$ 17,215,533	$ -	$ 17,215,533

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

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

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

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

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

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

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

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

Entry Age Actuarial Cost Method or Entry Age Normal (EAN) The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit 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.