Minnesota State Retirement System
Judges Retirement Fund

GASB Statements No. 67 and No. 68
Accounting and Financial Reporting for Pensions
June 30, 2021

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November 24, 2021

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

Dear Board of Directors:

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

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust. GASB Statement No. 82 is an amendment to GASB Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing financial reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. The calculation of the plan's liability for this report may not be applicable for purposes of funding the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statements No. 67 and No. 68 may produce significantly different results. The information in this report is calculated on a total plan basis. The Minnesota State Retirement System (MSRS) is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than 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, 2021 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

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

This report reflects the impact of COVID-19 through June 30, 2021. It does not reflect the ongoing impact of COVID-19, which is likely to influence demographic and investment experience, at least in the short term. We will continue to monitor these developments and their impact on the plan.

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

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

Brian B. Murphy 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,
Gabriel, Roeder, Smith & Company

Brian B. Murphy

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

Bonita J. Wurst

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

BBM/BJW:ah

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SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2021 (Dollars in Thousands)

		2021
Actuarial Valuation Date		June 30, 2021
Measurement Date of the Net Pension Liability		June 30, 2021
Membership		
Number of		
- Service Retirements		303
- Survivors		75
- Disability Retirements		16
- Deferred Retirements		19
- Terminated other non-vested		0
- Active Members		320
- Total		733
Covered-Employee Payroll	$	52,960 [1]
Net Pension Liability		
Total Pension Liability	$	429,083
Plan Fiduciary Net Position		276,638
Net Pension Liability	$	152,445
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		64.47%
Net Pension Liability as a Percentage of Covered-Employee Payroll		287.85%
Development of the Single Discount Rate		
Single Discount Rate		6.50%
Long-Term Expected Rate of Investment Return		6.50%
Long-Term Municipal Bond Rate		1.92% [2]
Last year ending June 30 in the 2022 to 2121 projection period for which projected benefit payments are fully funded		2121
Total Pension Expense/(Income)	$	4,449

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

		Deferred Outflows of Resources		Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of Total Pension Liability	$	605	$	1,667
Changes in assumptions		19,756		-
Net difference between projected and actual earnings on pension plan investments		4,276		40,189
Total	$	24,637	$	41,856

[1] *Assumed equal to actual employer contributions divided by employer 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.

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

Financial Statements

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

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to JRF subsequent to the measurement date of June 30, 2021.

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

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

Notes to Financial Statements

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

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

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

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

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

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the Judges Retirement Fund can be found online at www.msrs.state.mn.us/annual-reports-fy-2021 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
- Comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

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

Given the plan's contribution allocation procedure, if there are no changes in benefits, Chapter 356 required contributions are made, and all actuarial assumptions are met (including the assumption of the plan earning 7.50% on an actuarial value of assets basis, as prescribed by statutes), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to decline 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 27 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, 2021 and a measurement date of June 30, 2021.

Single Discount Rate

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

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 6.50%; the municipal bond rate is 1.92% (based on the weekly rate closest to but not later than the measurement date of the "20-Year Municipal GO AA Index" as published by Fidelity); and the resulting single discount rate is 6.50%.

SECTION B

FINANCIAL STATEMENTS

Statement of Pension Expense Under GASB Statement No. 68
Fiscal Year Ended June 30, 2021 (Dollars in Thousands)

A. Expense

1.	Service Cost	$	10,204
2.	Interest on the Total Pension Liability		29,568
3.	Current-Period Benefit Changes		(9,525)
4.	Employee Contributions		(4,166)
5.	Projected Earnings on Plan Investments		(16,067)
6.	Pension Plan Administrative Expense		77
7.	Other Changes in Plan Fiduciary Net Position		-
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		(296)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		4,939
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		(9,773)
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**4,961**
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	$	(705)
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		2,331
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		(2,138)
15.	**Total Pension Expense / (Income)**	**$**	**4,449**

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 3,517 years. Additionally, the total plan membership (active employees and inactive employees) was 729. 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 year (rounded).

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

Statement of Outflows and Inflows
Arising from Current Reporting Period
Fiscal Year Ended June 30, 2021 (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	$	(1,481)
2. Assumption Changes (gains) or losses		24,695
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		5
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability		(296)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes		4,939
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	4,643
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	$	(1,185)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes		19,756
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	18,571
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(48,867)
2. Recognition period for Assets {in years}		5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets		(9,773)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(39,094)

Statement of Outflows and Inflows
Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30, 2021 (Dollars in Thousands)

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

	Outflows of Resources	Inflows of Resources	Net Outflows/ (Inflows) of Resources
1. Due to Liabilities	$ 7,716	$ 1,447	$ 6,269
2. Due to Assets	1,457	13,368	(11,911)
3. Total	$ 9,173	$ 14,815	$ (5,642)

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	$ 446	$ 1,447	$ (1,001)
2. Assumption Changes	7,270	-	7,270
3. Net Difference between projected and actual earnings on pension plan investments	1,457	13,368	(11,911)
4. Total	**$ 9,173**	**$ 14,815**	**$ (5,642)**

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	$ 605	$ 1,667	$ (1,062)
2. Assumption Changes	19,756	-	19,756
3. Net Difference between projected and actual earnings on pension plan investments*	4,276	40,189	(35,913)
4. Total	**$ 24,637**	**$ 41,856**	**$ (17,219)**

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
2022	$ (4,483)
2023	(3,672)
2024	(3,932)
2025	(5,132)
2026	-
Thereafter	-
Total	**$ (17,219)**

** 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, 2021 (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					
2017	$ (4,958)	5.0000	$ (991)	$ 0	0.0000
2018	1,424	5.0000	285	284	1.0000
2019	804	5.0000	161	321	2.0000
2020	(802)	5.0000	(160)	(482)	3.0000
2021	(1,481)	5.0000	(296)	(1,185)	4.0000
Total			**$ (1,001)**	**$ (1,062)**	
Deferred Outflow (Inflow) Due to Assumption Changes					
2017	$ 11,652	5.0000	$ 2,331	$ 0	0.0000
2021	24,695	5.0000	4,939	19,756	4.0000
Total			**$ 7,270**	**$ 19,756**	
Deferred Outflow (Inflow) Due to Differences Between Projected and Actual Earnings on Plan Investments					
2017	$ (12,492)	5.0000	$ (2,499)	$ 0	0.0000
2018	(5,479)	5.0000	(1,096)	(1,095)	1.0000
2019	491	5.0000	98	197	2.0000
2020	6,797	5.0000	1,359	4,079	3.0000
2021	(48,867)	5.0000	(9,773)	(39,094)	4.0000
Total			**$ (11,911)**	**$ (35,913)**	
Deferred Outflow (Inflow) due to All Sources					
Total			**$ (5,642)**	**$ (17,219)**	

Statement of Fiduciary Net Position as of June 30, 2021 (Dollars in Thousands)

Assets		June 30, 2021
Cash & Short-term Investments	$	5,057
Receivables		506
Investment Pools (at fair value)		271,219
Securities Lending Collateral		17,586
Capital Assets		-
Total Assets	**$**	**294,368**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(17,730)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**276,638**

Statement of Changes in Fiduciary Net Position for the Fiscal Year Ended June 30, 2021 (Dollars in Thousands)

1. Net position at market value at beginning of year	**$**	**216,737**
Additions		
2. Contributions		
a. Employee	$	4,166
b. Employer		11,916
c. Other sources		6,000
d. Total contributions	$	22,082
3. Investment income		
a. Investment income/(loss)	$	65,198
b. Investment expenses		(264)
c. Net investment income/(loss)	$	64,934
4. Other Additions		-
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**87,016**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(27,038)
b. Refunds		-
c. Total benefits paid	$	(27,038)
7. Expenses		
a. Other deductions	$	-
b. Administrative		(77)
c. Total expenses	$	(77)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(27,115)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**59,901**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**276,638**
11. State Board of Investment calculated annual investment return for the Judges Retirement Fund*		30.1%

** The fiscal year 2021 investment return for the Combined Funds is 30.3%.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2021 (Dollars in Thousands)

A. Total pension liability			
1. Service Cost	$	10,204	
2. Interest on the Total Pension Liability		29,568	
3. Changes of benefit terms		(9,525)	
4. Difference between expected and actual experience of the Total Pension Liability		(1,481)	
5. Changes of assumptions		24,695	
6. Benefit payments, including refunds of employee contributions		(27,038)	
7. Net change in total pension liability	$	26,423	
8. Total pension liability – beginning		402,660	
9. Total pension liability – ending	**$**	**429,083**	
B. Plan fiduciary net position			
1. Contributions – employer	$	17,916	(1)
2. Contributions – employee		4,166	
3. Net investment income		64,934	
4. Benefit payments, including refunds of employee contributions		(27,038)	
5. Pension Plan Administrative Expense		(77)	
6. Other changes		-	
7. Net change in plan fiduciary net position	$	59,901	
8. Plan fiduciary net position – beginning		216,737	
9. Plan fiduciary net position – ending	**$**	**276,638**	
C. Net pension liability, *A.9 - B.9.*	**$**	**152,445**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9 / A.9.*		**64.47%**	
E. Covered-employee payroll	**$**	**52,960**	(2)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**287.85%**	

[1] *Includes $6 million supplemental state aid.*
[2] *Assumed equal to actual employer contributions divided by employer 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,	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Total Pension Liability										
Service Cost	$ 10,204	$ 9,897	$ 9,881	$ 9,857	$ 9,483	$ 13,711	$ 12,251	$ 12,075		
Interest on the Total Pension Liability	29,568	28,721	27,769	26,746	25,367	21,349	21,773	20,535		
Benefit Changes	(9,525)	-	-	-	-	0	0	0		
Experience[1]	(1,481)	(802)	804	1,424	(4,958)	7,135	(4,366)	5,080		
Assumption Changes	24,695	-	-	-	11,652	(85,756)	21,696	(8,416)		
Benefit Payments	(27,038)	(26,272)	(25,233)	(23,585)	(22,785)	(22,378)	(21,893)	(20,802)		
Refunds	-	(30)	-	-	(309)	0	0	0		
Net Change in Total Pension Liability	$ 26,423	$ 11,514	$ 13,221	$ 14,442	18,450	(65,939)	29,461	8,472		
Total Pension Liability - Beginning	402,660	391,146	377,925	363,483	345,033	410,972	381,511	373,039		
Total Pension Liability - Ending (a)	**$ 429,083**	**$ 402,660**	**$ 391,146**	**$ 377,925**	**$ 363,483**	**$ 345,033**	**$ 410,972**	**$ 381,511**		
Plan Fiduciary Net Position										
Employer Contributions [2]	$ 17,916	$ 17,767	$ 17,287	$ 17,027	$ 13,758	$ 10,219	$ 9,776	$ 9,426		
Employee Contributions	4,166	4,168	4,049	3,973	3,932	3,763	3,629	3,578		
Pension Plan Net Investment Income	64,934	8,955	14,491	19,265	24,729	(186)	7,572	28,011		
Benefit Payments	(27,038)	(26,272)	(25,233)	(23,585)	(22,785)	(22,378)	(21,893)	(20,802)		
Refunds	-	(30)	-	-	(309)	0	0	0		
Pension Plan Administrative Expense	(77)	(113)	(87)	(66)	(89)	(93)	(60)	(55)		
Other Changes	-	-	-	-	-	0	0	0		
Net Change in Plan Fiduciary Net Position	**$ 59,901**	**$ 4,475**	**$ 10,507**	**$ 16,614**	**19,236**	**(8,675)**	**(976)**	**20,158**		
Plan Fiduciary Net Position - Beginning	**$ 216,737**	**$ 212,262**	**$ 201,755**	**$ 185,141**	**165,905**	**174,580**	**175,556**	**155,398**		
Plan Fiduciary Net Position - Ending (b)	**$ 276,638**	**$ 216,737**	**$ 212,262**	**$ 201,755**	**$ 185,141**	**$ 165,905**	**$ 174,580**	**$ 175,556**		
Net Pension Liability - Ending (a) - (b)	**$ 152,445**	**$ 185,923**	**$ 178,884**	**$ 176,170**	**178,342**	**179,128**	**236,392**	**205,955**		
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**64.47 %**	**53.83 %**	**54.27 %**	**53.38 %**	**50.94 %**	**48.08 %**	**42.48 %**	**46.02 %**		
Covered-Employee Payroll[3]	**$ 52,960**	**$ 52,298**	**$ 50,164**	**$ 49,009**	**$ 47,813**	**$ 45,418**	**$ 43,449**	**$ 41,893**		
Net Pension Liability as a Percentage of Covered-Employee Payroll	**287.85 %**	**355.51 %**	**356.60 %**	**359.46 %**	**373.00 %**	**394.40 %**	**544.07 %**	**491.62 %**		

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

(2) *Includes $3 million supplemental state aid for fiscal year ending 2017 and $6 million annual supplemental state aid thereafter.*

(3) *Assumed equal to actual employer contributions divided by employer 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)/(c)	(d)	(c)/(d)
2012						
2013						
2014	$ 381,511	$ 175,556	$ 205,955	46.02%	$ 41,893	491.62%
2015	410,972	174,580	236,392	42.48	43,449	544.07
2016	345,033	165,905	179,128	48.08	45,418	394.40
2017	363,483	185,141	178,342	50.94	47,813	373.00
2018	377,925	201,755	176,170	53.38	49,009	359.46
2019	391,146	212,262	178,884	54.27	50,164	356.60
2020	402,660	216,737	185,923	53.83	52,298	355.51
2021	429,083	276,638	152,445	64.47	52,960	287.85

Schedule of Contributions Multiyear (Dollars in Thousands)

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Actuarially Determined Contribution [1]	Actual Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll [2]	Actual Contributions as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b)/(d)
2012	$ 9,879	$ 7,922	$ 1,957	$ 38,644	20.50%
2013	13,524	8,177	5,347	39,888	20.50
2014	14,193	9,426	4,767	41,893	22.50
2015	14,298	9,776	4,522	43,449	22.50
2016	15,644	10,219	5,425	45,418	22.50
2017	16,790	13,758 [3]	3,032	47,813	28.77
2018	18,032	17,027 [3]	1,005	49,009	34.74
2019	17,491	17,287 [3]	204	50,164	34.46
2020	18,304	17,767 [3]	537	52,298	33.97
2021	18,167	17,916 [3]	251	52,960	33.83

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Fiscal Year Ending June 30, 2021 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 employer contributions divided by employer contribution rate. [3] Includes supplemental state aid of $3,000 for fiscal year ending June 30, 2017 and $6,000 annual supplemental state aid thereafter.
Valuation Date	June 30, 2020
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	28 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.50%
Payroll Increases	2.50%
Salary Increases	2.50%
Investment Rate of Return	7.50%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2017 valuation pursuant to an experience study of the period 2011 - 2015, dated July 26, 2016.
Healthy Post-Retirement Mortality	RP-2014 annuitant generational mortality table projected with mortality improvement Scale MP-2015 from a base year of 2006, white collar adjustment.
Other Information	
Benefit Increases After Retirement	The post-retirement increase is assumed to be 1.75% per year through 2041, 2% per year from 2042 through 2058 and 2.5% per year thereafter. See separate funding actuarial valuation report as of July 1, 2020 for additional detail. To obtain this report, contact MSRS as noted on page 3. This report is also available online at: https://www.msrs.state.mn.us/annual-reports-fy-2020

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2012	
2013	
2014	18.7 %
2015	4.5
2016	-0.1
2017	15.2
2018	10.5
2019	7.2
2020	4.2
2021	30.1

[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, 2021, the annual money-weighted rate of return for the Judges Retirement Fund was 30.1%. 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 1.651.296.3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

Asset Allocation

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Estimates for expected future real rates of return (expected returns, net of inflation) were developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce a geometric, long-term expected real rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each asset class that is included in the pension fund's target asset allocation as of June 30, 2021, these estimates are summarized in the following table:

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

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

For purposes of this valuation, the long-term expected rate of return assumption is 6.50%. This assumption is based on a review of inflation and investment return assumptions in our report dated June 24, 2021.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

Single Discount Rate

A single discount rate of 6.50% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 6.50%. The projection of cash flows used to determine this single discount rate assumed that member, employer, and state contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position and future contributions were projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the fund's net pension liability, calculated using a single discount rate of 6.50%, 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 (5.50%) or 1-percentage-point higher (7.50%) than the current rate:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 5.50%	Current Single Discount Rate Assumption 6.50%	1% Increase 7.50%
Total Pension Liability	$473,145	$429,083	$391,341
Net Position Restricted for Pensions	276,638	276,638	276,638
Net Pension Liability	**$196,507**	**$152,445**	**$114,703**

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

Note that we believe the 7.50% interest rate assumption does not comply with Actuarial Standards of Practice.

GASB Statement No. 68 Reconciliation (Dollars in Thousands)

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Total Pension Expense
Balance Beginning of Year	**$ 402,660**	**$ 216,737**	**$ 185,923**	**$ 9,115**	**$ 6,323**	
Changes for the Year:						
Service Cost	$ 10,204		$ 10,204			$ 10,204
Interest on Total Pension Liability	29,568		29,568			29,568
Interest on Plan Fiduciary Net Position		$ 16,067 (1)	(16,067)			(16,067)
Changes in Benefit Terms	(9,525)		(9,525)			(9,525)
Liability Experience Gains and Losses	(1,481)		(1,481)	$ -	$ 1,185	(296)
Changes in Assumptions	24,695		24,695	19,756	-	4,939
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(446)	(1,151)	(705)
Assumption Changes				(2,331)	-	2,331
Investment Gains/(Losses)				(1,457)	(3,595)	(2,138)
Contributions - Employer		17,916	(17,916)			
Contributions - Employees		4,166	(4,166)			(4,166)
Asset Gain/(Loss)		48,867 (1)	(48,867)	-	39,094	(9,773)
Benefit Payments and Refunds	(27,038)	(27,038)	-			
Administrative Expenses		(77)	77			77
Other Changes						
Net Changes	**$ 26,423**	**$ 59,901**	**$ (33,478)**	**$ 15,522**	**$ 35,533**	**$ 4,449**
Balance End of Year	**$ 429,083**	**$ 276,638**	**$ 152,445**	**$ 24,637**	**$ 41,856**	

(1) The sum of these items in column (b) equals the net investment income of $64,934.

Summary of Population Statistics

		Terminated		Recipients			
	Actives*	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on July 1, 2020	**322**	**17**	**0**	**298**	**16**	**76**	**729**
New members	16						**16**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	0	0	0	0	0	0	**0**
Service retirements	(15)	0	0	15	0	0	**0**
Terminated deferred	(2)	2	0	0	0	0	**0**
Terminated refund/transfer	0	0	0	0	0	0	**0**
Deaths	0	0	0	(11)	(1)	(8)	**(20)**
New beneficiary	0	0	0	0	0	7	**7**
Disabled	(1)	0	0	0	1	0	**0**
Data adjustments	0	0	0	1	0	0	**1**
Net change	(2)	2	0	5	0	(1)	**4**
Members on July 1, 2021	**320**	**19**	**0**	**303**	**16**	**75**	**733**

* *Includes Tier 1 active Judges who have reached the maximum benefit formula (employee contributions are directed to the Unclassified Employees Retirement Plan).*

SECTION E

SUMMARY OF BENEFITS

Summary of Plan Provisions

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

Plan year	July 1 through June 30.
Eligibility	A judge or justice of any court. If the member was active prior to January 1, 1974, benefits may be computed according to provisions of the prior plan.
Tier 1 / Tier 2 member	Tier 1 includes judges or justices first appointed or elected before July 1, 2013, and Tier 2 includes judges or justices first appointed or elected after June 30, 2013. A judge or justice with less than five years of service as of December 30, 2013, may make a one-time irrevocable election into Tier 2. For the purpose of this valuation, we have assumed no Tier 1 members elected Tier 2 benefits as of the valuation date.
Contributions	
Member	9.00% of salary for Tier 1 members, 7.00% of salary for Tier 2 members. Tier 1 member contributions after maximum benefit is reached are redirected to the Unclassified Employees Retirement Plan.
Employer	22.50% of salary. Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
State contributions	$6,000,000 per year until the earlier of 1) the year after the plan reaches full funding on an actuarial value of assets basis, and 2) July 1, 2048.
Allowable service	Service as a judge. Credit may also be earned for uncredited judicial service if the appropriate employee contributions, with interest, are made.
Salary	Salary set by law.
Average salary	Average of the five highest years of salary of the last 10 years prior to termination of judicial service.

Summary of Plan Provisions (Continued)

Retirement

Normal retirement benefit

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

Early retirement

Age/Service requirement	Age 60 and five years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.50% for each month the member is under Normal Retirement Age at time of retirement.
Form of payment	Life annuity. Actuarially equivalent options are: (a.) 50%,75% or 100% joint and survivor with no bounce back feature (b.) 50%, 75% or 100% with bounce back feature (c.) 15-year certain and life thereafter
Benefit increases	Through December 31, 2021: 1.75% January 1, 2022 and after: 1.50% A benefit recipient who has been receiving a benefit for at least 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a pro rata increase.

Summary of Plan Provisions (Continued)

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

Termination	
Refund of contributions	
Age/Service requirement	Termination of service as a judge.
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	Five years of Allowable Service.
Amount	Benefit computed under law in effect at termination. Amount is payable at normal or early retirement. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Form of payment	Same as for retirement.
Optional form conversion factors	Effective July 1, 2019 and phased in over a 24-month period, actuarially equivalent factors based on the RP-2014 mortality table for healthy annuitants for a member turning age 66 in 2021, reflecting projected mortality improvements using Scale MP-2017, white collar adjustment, blended 70% males, 5.65% post-retirement interest, and 7.50% pre-retirement interest. Reflecting statutory requirements, joint and survivor factors are based on an interest assumption of 6.50%.
Combined service annuity	Members are eligible for combined service benefits if they: (a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement; (b.) Have at least six months of allowable service credit in each plan worked under; and (c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year. Members who meet the above requirements must have their benefit based on the following: (a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement; and (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Changes in plan provisions	Post-retirement benefit increases were changed from 1.75% per year, increasing to 2.00% per year upon achieving a 70% funding ratio, and increasing to 2.50% upon achieving a 90% funded ratio, to a fixed 1.50% per year beginning January 1, 2022.

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 30, 2020, and a review of inflation and investment assumptions dated June 24, 2021.

Investment return	6.50% per annum.
Single discount rate	6.50% per annum.
Salary increases	2.50% per year.
Payroll growth	2.50% per year.
Inflation	2.25% per year.
Mortality rates	
Healthy pre-retirement	Pub-2010 General Employee Mortality Table adjusted for mortality improvements using mortality improvement Scale MP-2019.
Healthy post-retirement	Pub-2010 General Retired Mortality Table adjusted for mortality improvements using mortality improvement Scale MP-2019.
Disabled	Pub-2010 General Disabled Mortality Table adjusted for mortality improvements using mortality improvement Scale MP-2019.
Notes	The Pub-2010 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 18 to 80 and the annuitant mortality table contains mortality rates for ages 50 to 120. We have extended the annuitant mortality table as needed for members younger than age 50 who are receiving a benefit by deriving rates based on the employee table and the juvenile table. Similarly, we have extended the employee table as needed for members older than age 80 by deriving rates based on the annuitant table.
Retirement	Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year.
Withdrawal	None.
Disability	Age-related rates based on experience; see table of sample rates.
Administrative expenses	In the valuation year, equal to prior year administrative expenses expressed as a percentage of prior year projected payroll. In each subsequent year, equal to the initial administrative expense percentage applied to payroll for the closed group.

Summary of Actuarial Assumptions (Continued)

Refund of contributions	For non-vested members, account balances accumulate interest until the assumed commencement date and are discounted back to the valuation date. Active members decrementing after becoming eligible for a benefit are assumed to take the contributions accumulated with interest if larger than the value of the benefit.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 65.
Percentage married	Marital status as indicated by data.
Age of spouse	Male members are assumed to have a beneficiary three years younger and female members are assumed to have a beneficiary two years older.
Form of payment	Members are assumed to elect a life annuity.
Allowance for Combined Service Annuity	None.
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	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.
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. There were no members reported with missing or invalid birth dates. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members</u>: There were 6 Tier 1 members who have reached the 24-year service cap. These members are reflected as active members in this valuation. We assumed these members earned the greater of the salary reported under the Unclassified Employees Retirement Plan or $165,135.88 for the July 1, 2020 to June 30, 2021 plan year. There were no members reported with missing service. There were no members reported with a missing or invalid gender.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members (Concluded)	Data for terminated members: There were no members reported without a benefit and no members reported with a missing or invalid gender. Data for members receiving benefits: There were no members reported without a benefit. There were 2 members reported with a missing gender. We assumed male gender for retirees and female gender for survivors. There were 3 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor and the member benefit already reflected the increase to the life annuity value (i.e. "bounce back"), if applicable. There were 3 retirees reported with a bounceback annuity and an unreasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively. There were no survivors reported on the data file with an expired benefit. There were retired members reported with a survivor option and an invalid or missing survivor gender (34 members) and/or survivor date of birth (31 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid.
Changes in actuarial assumptions	The investment return and single discount rates were changed from 7.50% to 6.50%. The assumed inflation assumption was changed from 2.50% to 2.25%. The base mortality table for healthy annuitants and employees was changed from the RP-2014 table to the Pub-2010 General Mortality table and the mortality improvement scale was changed from MP-2015 to MP-2019. The base mortality table for disabled annuitants was changed from RP-2014 annuitant mortality table to the Pub-2010 General disabled annuitant mortality table and the mortality improvement scale was changed from MP-2015 to MP-2019. Assumed rates of unreduced and early retirement were changed as recommended in the June 30, 2020 experience study. The new rates result in more predicted retirements. Assumed rates of disability were changed to 60% of the previous rates, as recommended in the June 30, 2020 experience study. The assumed spouse age difference for female members was changed from three years older to two years older.

Summary of Actuarial Assumptions (Concluded)

Age in 2021	Percentage of Members Dying each Year*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality**	
	Male	Female	Male	Female	Male	Female
20	0.04%	0.01%	0.04%	0.01%	0.44%	0.26%
25	0.03	0.01	0.03	0.01	0.34	0.20
30	0.05	0.02	0.05	0.02	0.50	0.35
35	0.07	0.03	0.07	0.03	0.67	0.55
40	0.08	0.04	0.08	0.04	0.82	0.74
45	0.11	0.06	0.10	0.06	1.04	0.98
50	0.28	0.21	0.14	0.08	1.50	1.42
55	0.42	0.30	0.21	0.13	2.06	1.82
60	0.64	0.41	0.33	0.20	2.60	2.08
65	0.92	0.59	0.47	0.29	3.07	2.18
70	1.42	0.96	0.66	0.44	3.64	2.58
75	2.42	1.71	0.99	0.73	4.70	3.63
80	4.36	3.14	1.58	1.24	6.70	5.62
85	7.96	5.91	6.70	5.08	10.03	8.89
90	13.77	10.98	13.77	10.98	15.25	13.06

* *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-2019 from a base year of 2010.*

Percentage of Eligible Members Retiring each Year

Age	Disabled Retirement	Age	Healthy Retirement
20	0.000%	60	0.0%
25	0.000	61	2.5
30	0.000	62	4.0
35	0.000	63	8.0
40	0.006	64	8.0
45	0.018	65	25.0
50	0.030	66	23.0
55	0.072	67	15.0
60	0.186	68	20.0
65	0.000	69	40.0
70	0.000	70	100.0

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Fiduciary Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term 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 plan fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.50%; the municipal bond rate is 1.92% (based on the weekly rate closest to but not later than the measurement date of the “20-Year Municipal GO Index” as published by Fidelity) and **the resulting single discount rate as of June 30, 2021 is 6.50%.** 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*	Additional State Contributions**	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)		(g) = (d) + (e) + (f)
2021	$ 52,960		$ 52,960					
2022	53,235	$ 1,116	54,351	$ 4,154	$ 11,978	$ 109	$ 6,000	$ 22,241
2023	51,497	4,213	55,710	3,989	11,587	413	6,000	21,989
2024	49,186	7,917	57,103	3,782	11,067	777	6,000	21,626
2025	47,088	11,442	58,530	3,593	10,595	1,122	6,000	21,310
2026	45,151	14,842	59,993	3,420	10,159	1,456	6,000	21,035
2027	43,373	18,120	61,493	3,260	9,759	1,778	6,000	20,797
2028	41,449	21,582	63,031	3,092	9,326	2,117	6,000	20,535
2029	39,292	25,314	64,606	2,908	8,841	2,483	6,000	20,232
2030	36,988	29,234	66,222	2,716	8,322	2,868	6,000	19,906
2031	34,713	33,164	67,877	2,530	7,810	3,253	6,000	19,593
2032	32,313	37,261	69,574	2,336	7,270	3,655	6,000	19,261
2033	29,874	41,439	71,313	2,143	6,722	4,065	6,000	18,930
2034	27,618	45,478	73,096	1,965	6,214	4,461	6,000	18,640
2035	25,417	49,507	74,924	1,794	5,719	4,857	6,000	18,370
2036	22,946	53,851	76,797	1,606	5,163	5,283	6,000	18,052
2037	20,361	58,356	78,717	1,425	4,581	5,725	6,000	17,731
2038	18,050	62,634	80,684	1,263	4,061	6,144	6,000	17,468
2039	15,913	66,789	82,702	1,114	3,580	6,552	6,000	17,246
2040	13,825	70,944	84,769	968	3,111	6,960	6,000	17,039
2041	11,804	75,084	86,888	826	2,656	7,366	-	10,848
2042	9,975	79,086	89,061	698	2,244	7,758	-	10,700
2043	8,248	83,039	91,287	577	1,856	8,146	-	10,579
2044	6,662	86,907	93,569	466	1,499	8,526	-	10,491
2045	5,315	90,593	95,908	372	1,196	8,887	-	10,455
2046	4,045	94,261	98,306	283	910	9,247	-	10,440
2047	2,955	97,809	100,764	207	665	9,595	-	10,467
2048	2,121	101,162	103,283	148	477	9,924	-	10,549
2049	1,442	104,423	105,865	101	324	10,244	-	10,669
2050	899	107,613	108,512	63	202	10,557	-	10,822
2051	515	110,709	111,224	36	116	10,861	-	11,013
2052	281	113,724	114,005	20	63	11,156	-	11,239
2053	97	116,758	116,855	7	22	11,454	-	11,483
2054	-	119,777	119,777	-	-	11,750	-	11,750
2055	-	122,771	122,771	-	-	12,044	-	12,044
2056	-	125,840	125,840	-	-	12,345	-	12,345
2057	-	128,986	128,986	-	-	12,654	-	12,654
2058	-	132,211	132,211	-	-	12,970	-	12,970
2059	-	135,516	135,516	-	-	13,294	-	13,294
2060	-	138,904	138,904	-	-	13,626	-	13,626
2061	-	142,377	142,377	-	-	13,967	-	13,967
2062	-	145,936	145,936	-	-	14,316	-	14,316
2063	-	149,585	149,585	-	-	14,674	-	14,674
2064	-	153,324	153,324	-	-	15,041	-	15,041
2065	-	157,157	157,157	-	-	15,417	-	15,417
2066	-	161,086	161,086	-	-	15,803	-	15,803
2067	-	165,113	165,113	-	-	16,198	-	16,198
2068	-	169,241	169,241	-	-	16,603	-	16,603
2069	-	173,472	173,472	-	-	17,018	-	17,018
2070	-	177,809	177,809	-	-	17,443	-	17,443
2071	-	182,254	182,254	-	-	17,879	-	17,879

* *Equal to total contributions (29.50% of new employee payroll) net of new employee normal cost and expenses (19.69% of pay).*

** *Additional State contributions equal to $6 million are assumed to stop after 19 years.*

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*	Additional State Contributions	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)		(g) = (d) + (e) + (f)
2072	$ -	$ 186,811	$ 186,811	$ -	$ -	$ 18,326	$ -	$ 18,326
2073	-	191,481	191,481	-	-	18,784	-	18,784
2074	-	196,268	196,268	-	-	19,254	-	19,254
2075	-	201,175	201,175	-	-	19,735	-	19,735
2076	-	206,204	206,204	-	-	20,229	-	20,229
2077	-	211,359	211,359	-	-	20,734	-	20,734
2078	-	216,643	216,643	-	-	21,253	-	21,253
2079	-	222,059	222,059	-	-	21,784	-	21,784
2080	-	227,611	227,611	-	-	22,329	-	22,329
2081	-	233,301	233,301	-	-	22,887	-	22,887
2082	-	239,133	239,133	-	-	23,459	-	23,459
2083	-	245,112	245,112	-	-	24,045	-	24,045
2084	-	251,239	251,239	-	-	24,647	-	24,647
2085	-	257,520	257,520	-	-	25,263	-	25,263
2086	-	263,958	263,958	-	-	25,894	-	25,894
2087	-	270,557	270,557	-	-	26,542	-	26,542
2088	-	277,321	277,321	-	-	27,205	-	27,205
2089	-	284,254	284,254	-	-	27,885	-	27,885
2090	-	291,361	291,361	-	-	28,582	-	28,582
2091	-	298,645	298,645	-	-	29,297	-	29,297
2092	-	306,111	306,111	-	-	30,029	-	30,029
2093	-	313,764	313,764	-	-	30,780	-	30,780
2094	-	321,608	321,608	-	-	31,550	-	31,550
2095	-	329,648	329,648	-	-	32,338	-	32,338
2096	-	337,889	337,889	-	-	33,147	-	33,147
2097	-	346,336	346,336	-	-	33,976	-	33,976
2098	-	354,995	354,995	-	-	34,825	-	34,825
2099	-	363,870	363,870	-	-	35,696	-	35,696
2100	-	372,966	372,966	-	-	36,588	-	36,588
2101	-	382,291	382,291	-	-	37,503	-	37,503
2102	-	391,848	391,848	-	-	38,440	-	38,440
2103	-	401,644	401,644	-	-	39,401	-	39,401
2104	-	411,685	411,685	-	-	40,386	-	40,386
2105	-	421,977	421,977	-	-	41,396	-	41,396
2106	-	432,527	432,527	-	-	42,431	-	42,431
2107	-	443,340	443,340	-	-	43,492	-	43,492
2108	-	454,423	454,423	-	-	44,579	-	44,579
2109	-	465,784	465,784	-	-	45,693	-	45,693
2110	-	477,429	477,429	-	-	46,836	-	46,836
2111	-	489,364	489,364	-	-	48,007	-	48,007
2112	-	501,598	501,598	-	-	49,207	-	49,207
2113	-	514,138	514,138	-	-	50,437	-	50,437
2114	-	526,992	526,992	-	-	51,698	-	51,698
2115	-	540,167	540,167	-	-	52,990	-	52,990
2116	-	553,671	553,671	-	-	54,315	-	54,315
2117	-	567,512	567,512	-	-	55,673	-	55,673
2118	-	581,700	581,700	-	-	57,065	-	57,065
2119	-	596,243	596,243	-	-	58,491	-	58,491
2120	-	611,149	611,149	-	-	59,954	-	59,954
2121	-	626,428	626,428	-	-	62,142	-	62,142

* *Equal to total contributions (29.50% of new employee payroll) net of new employee normal cost and expenses (19.69% of pay).*

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

Fiscal Year Ending	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 6.50%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2022	$ 276,638	$ 22,241	$ 27,529	$ 75	$ 17,810	$ 289,085
2023	289,085	21,989	28,601	72	18,577	300,978
2024	300,978	21,626	30,004	69	19,293	311,824
2025	311,824	21,310	31,286	66	19,947	321,729
2026	321,729	21,035	32,481	63	20,544	330,764
2027	330,764	20,797	33,494	61	21,092	339,098
2028	339,098	20,535	34,537	58	21,592	346,630
2029	346,630	20,232	35,555	55	22,039	353,291
2030	353,291	19,906	36,733	52	22,424	358,836
2031	358,836	19,593	37,652	49	22,745	363,473
2032	363,473	19,261	38,574	45	23,007	367,122
2033	367,122	18,930	39,425	42	23,206	369,791
2034	369,791	18,640	40,021	39	23,351	371,722
2035	371,722	18,370	40,494	36	23,453	373,015
2036	373,015	18,052	40,992	32	23,511	373,554
2037	373,554	17,731	41,505	29	23,520	373,271
2038	373,271	17,468	41,780	25	23,484	372,418
2039	372,418	17,246	41,875	22	23,419	371,186
2040	371,186	17,039	41,890	19	23,332	369,648
2041	369,648	10,848	41,749	17	23,038	361,768
2042	361,768	10,700	41,432	14	22,532	353,554
2043	353,554	10,579	41,000	12	22,008	345,129
2044	345,129	10,491	40,425	9	21,476	336,662
2045	336,662	10,455	39,652	7	20,949	328,407
2046	328,407	10,440	38,790	6	20,440	320,491
2047	320,491	10,467	37,792	4	19,958	313,120
2048	313,120	10,549	36,626	3	19,519	306,559
2049	306,559	10,669	35,363	2	19,137	301,000
2050	301,000	10,822	34,018	1	18,823	296,626
2051	296,626	11,013	32,589	1	18,591	293,640
2052	293,640	11,239	31,088	-	18,452	292,243
2053	292,243	11,483	29,576	-	18,417	292,567
2054	292,567	11,750	28,035	-	18,496	294,778
2055	294,778	12,044	26,467	-	18,699	299,054
2056	299,054	12,345	24,926	-	19,036	305,509
2057	305,509	12,654	23,414	-	19,514	314,263
2058	314,263	12,970	21,932	-	20,141	325,442
2059	325,442	13,294	20,483	-	20,924	339,177
2060	339,177	13,626	19,067	-	21,873	355,609
2061	355,609	13,967	17,687	-	22,996	374,885
2062	374,885	14,316	16,345	-	24,303	397,159
2063	397,159	14,674	15,044	-	25,803	422,592
2064	422,592	15,041	13,786	-	27,509	451,356
2065	451,356	15,417	12,573	-	29,429	483,629
2066	483,629	15,803	11,408	-	31,577	519,601
2067	519,601	16,198	10,294	-	33,963	559,468
2068	559,468	16,603	9,235	-	36,601	603,437
2069	603,437	17,018	8,234	-	39,504	651,725
2070	651,725	17,443	7,292	-	42,687	704,563
2071	704,563	17,879	6,413	-	46,163	762,192

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 Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 6.50%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2072	$ 762,192	$ 18,326	$ 5,598	$ -	$ 49,950	$ 824,870
2073	824,870	18,784	4,848	-	54,062	892,868
2074	892,868	19,254	4,164	-	58,519	966,477
2075	966,477	19,735	3,545	-	63,339	1,046,006
2076	1,046,006	20,229	2,989	-	68,542	1,131,788
2077	1,131,788	20,734	2,495	-	74,150	1,224,177
2078	1,224,177	21,253	2,060	-	80,185	1,323,555
2079	1,323,555	21,784	1,680	-	86,674	1,430,333
2080	1,430,333	22,329	1,353	-	93,643	1,544,952
2081	1,544,952	22,887	1,074	-	101,120	1,667,885
2082	1,667,885	23,459	840	-	109,136	1,799,640
2083	1,799,640	24,045	646	-	117,725	1,940,764
2084	1,940,764	24,647	487	-	126,922	2,091,846
2085	2,091,846	25,263	361	-	136,767	2,253,515
2086	2,253,515	25,894	262	-	147,298	2,426,445
2087	2,426,445	26,542	185	-	158,562	2,611,364
2088	2,611,364	27,205	128	-	170,605	2,809,046
2089	2,809,046	27,885	87	-	183,477	3,020,321
2090	3,020,321	28,582	57	-	197,233	3,246,079
2091	3,246,079	29,297	36	-	211,931	3,487,271
2092	3,487,271	30,029	22	-	227,633	3,744,911
2093	3,744,911	30,780	13	-	244,403	4,020,081
2094	4,020,081	31,550	8	-	262,314	4,313,937
2095	4,313,937	32,338	4	-	281,440	4,627,711
2096	4,627,711	33,147	2	-	301,862	4,962,718
2097	4,962,718	33,976	1	-	323,664	5,320,357
2098	5,320,357	34,825	1	-	346,937	5,702,118
2099	5,702,118	35,696	-	-	371,780	6,109,594
2100	6,109,594	36,588	-	-	398,294	6,544,476
2101	6,544,476	37,503	-	-	426,591	7,008,570
2102	7,008,570	38,440	-	-	456,787	7,503,797
2103	7,503,797	39,401	-	-	489,007	8,032,205
2104	8,032,205	40,386	-	-	523,385	8,595,976
2105	8,595,976	41,396	-	-	560,063	9,197,435
2106	9,197,435	42,431	-	-	599,190	9,839,056
2107	9,839,056	43,492	-	-	640,930	10,523,478
2108	10,523,478	44,579	-	-	685,452	11,253,509
2109	11,253,509	45,693	-	-	732,940	12,032,142
2110	12,032,142	46,836	-	-	783,587	12,862,565
2111	12,862,565	48,007	-	-	837,602	13,748,174
2112	13,748,174	49,207	-	-	895,205	14,692,586
2113	14,692,586	50,437	-	-	956,631	15,699,654
2114	15,699,654	51,698	-	-	1,022,131	16,773,483
2115	16,773,483	52,990	-	-	1,091,971	17,918,444
2116	17,918,444	54,315	-	-	1,166,436	19,139,195
2117	19,139,195	55,673	-	-	1,245,829	20,440,697
2118	20,440,697	57,065	-	-	1,330,471	21,828,233
2119	21,828,233	58,491	-	-	1,420,706	23,307,430
2120	23,307,430	59,954	-	-	1,516,901	24,884,285
2121	24,884,285	62,142	-	-	1,619,466	26,565,893

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)
2018	$ 276,638	$ 27,529	$ 27,529	$ -	$ 26,676	$ -	$ 26,676
2019	289,085	28,601	28,601	-	26,023	-	26,023
2020	300,978	30,004	30,004	-	25,633	-	25,633
2021	311,824	31,286	31,286	-	25,097	-	25,097
2022	321,729	32,481	32,481	-	24,466	-	24,466
2023	330,764	33,494	33,494	-	23,689	-	23,689
2024	339,098	34,537	34,537	-	22,936	-	22,936
2025	346,630	35,555	35,555	-	22,171	-	22,171
2026	353,291	36,733	36,733	-	21,507	-	21,507
2027	358,836	37,652	37,652	-	20,700	-	20,700
2028	363,473	38,574	38,574	-	19,912	-	19,912
2029	367,122	39,425	39,425	-	19,109	-	19,109
2030	369,791	40,021	40,021	-	18,215	-	18,215
2031	371,722	40,494	40,494	-	17,305	-	17,305
2032	373,015	40,992	40,992	-	16,449	-	16,449
2033	373,554	41,505	41,505	-	15,638	-	15,638
2034	373,271	41,780	41,780	-	14,781	-	14,781
2035	372,418	41,875	41,875	-	13,910	-	13,910
2036	371,186	41,890	41,890	-	13,066	-	13,066
2037	369,648	41,749	41,749	-	12,227	-	12,227
2038	361,768	41,432	41,432	-	11,394	-	11,394
2039	353,554	41,000	41,000	-	10,587	-	10,587
2040	345,129	40,425	40,425	-	9,801	-	9,801
2041	336,662	39,652	39,652	-	9,027	-	9,027
2042	328,407	38,790	38,790	-	8,292	-	8,292
2043	320,491	37,792	37,792	-	7,585	-	7,585
2044	313,120	36,626	36,626	-	6,903	-	6,903
2045	306,559	35,363	35,363	-	6,258	-	6,258
2046	301,000	34,018	34,018	-	5,653	-	5,653
2047	296,626	32,589	32,589	-	5,085	-	5,085
2048	293,640	31,088	31,088	-	4,554	-	4,554
2049	292,243	29,576	29,576	-	4,068	-	4,068
2050	292,567	28,035	28,035	-	3,621	-	3,621
2051	294,778	26,467	26,467	-	3,210	-	3,210
2052	299,054	24,926	24,926	-	2,839	-	2,839
2053	305,509	23,414	23,414	-	2,504	-	2,504
2054	314,263	21,932	21,932	-	2,202	-	2,202
2055	325,442	20,483	20,483	-	1,931	-	1,931
2056	339,177	19,067	19,067	-	1,688	-	1,688
2057	355,609	17,687	17,687	-	1,470	-	1,470
2058	374,885	16,345	16,345	-	1,276	-	1,276
2059	397,159	15,044	15,044	-	1,102	-	1,102
2060	422,592	13,786	13,786	-	949	-	949
2061	451,356	12,573	12,573	-	812	-	812
2062	483,629	11,408	11,408	-	692	-	692
2063	519,601	10,294	10,294	-	586	-	586
2064	559,468	9,235	9,235	-	494	-	494
2065	603,437	8,234	8,234	-	414	-	414
2066	651,725	7,292	7,292	-	344	-	344
2067	704,563	6,413	6,413	-	284	-	284

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)
2068	$ 762,192	$ 5,598	$ 5,598	$ -	$ 26,676	$ -	$ 233
2069	824,870	4,848	4,848	-	26,023	-	189
2070	892,868	4,164	4,164	-	25,633	-	153
2071	966,477	3,545	3,545	-	25,097	-	122
2072	1,046,006	2,989	2,989	-	24,466	-	97
2073	1,131,788	2,495	2,495	-	23,689	-	76
2074	1,224,177	2,060	2,060	-	22,936	-	59
2075	1,323,555	1,680	1,680	-	22,171	-	45
2076	1,430,333	1,353	1,353	-	21,507	-	34
2077	1,544,952	1,074	1,074	-	20,700	-	25
2078	1,667,885	840	840	-	19,912	-	19
2079	1,799,640	646	646	-	19,109	-	13
2080	1,940,764	487	487	-	18,215	-	10
2081	2,091,846	361	361	-	17,305	-	7
2082	2,253,515	262	262	-	16,449	-	5
2083	2,426,445	185	185	-	15,638	-	3
2084	2,611,364	128	128	-	14,781	-	2
2085	2,809,046	87	87	-	13,910	-	1
2086	3,020,321	57	57	-	13,066	-	1
2087	3,246,079	36	36	-	12,227	-	0
2088	3,487,271	22	22	-	11,394	-	0
2089	3,744,911	13	13	-	10,587	-	0
2090	4,020,081	8	8	-	9,801	-	0
2091	4,313,937	4	4	-	9,027	-	0
2092	4,627,711	2	2	-	8,292	-	0
2093	4,962,718	1	1	-	7,585	-	0
2094	5,320,357	1	1	-	6,903	-	0
2095	5,702,118	-	-	-	6,258	-	0
2096	6,109,594	-	-	-	5,653	-	0
2097	6,544,476	-	-	-	5,085	-	0
2098	7,008,570	-	-	-	4,554	-	0
2099	7,503,797	-	-	-	4,068	-	0
2100	8,032,205	-	-	-	3,621	-	0
2101	8,595,976	-	-	-	3,210	-	-
2102	9,197,435	-	-	-	2,839	-	-
2103	9,839,056	-	-	-	2,504	-	-
2104	10,523,478	-	-	-	2,202	-	-
2105	11,253,509	-	-	-	1,931	-	-
2106	12,032,142	-	-	-	1,688	-	-
2107	12,862,565	-	-	-	1,470	-	-
2108	13,748,174	-	-	-	1,276	-	-
2109	14,692,586	-	-	-	1,102	-	-
2110	15,699,654	-	-	-	949	-	-
2111	16,773,483	-	-	-	812	-	-
2112	17,918,444	-	-	-	692	-	-
2113	19,139,195	-	-	-	586	-	-
2114	20,440,697	-	-	-	494	-	-
2115	21,828,233	-	-	-	414	-	-
2116	23,307,430	-	-	-	344	-	-
2117	24,884,285	-	-	-	284	-	-
				Totals	$ 516,227	$ -	$ 516,227

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

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

Glossary of Terms

Amortization Method	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered-Employee Payroll	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
Deferred Inflows and Outflows of Resources	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
Discount Rate or Single Discount Rate	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: 1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and 2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.
Entry Age Actuarial Cost Method 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 in measurement of the Total Pension Liability
9. Recognition of Outflow (Inflow) of Resources due to Assumption Changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments

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

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

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