Minnesota State Retirement System
Judges Retirement Fund

GASB Statements No. 67 and No. 68
Accounting and Financial Reporting for Pensions
June 30, 2019

GRS Retirement Consulting

P: 800.521.0498 | F: 763.432.5842 | www.grsconsulting.com

November 27, 2019

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 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 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.

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

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, 2019 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

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.

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

Table of Contents

SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2019 (Dollars in Thousands)

	2019
Actuarial Valuation Date	June 30, 2019
Measurement Date of the Net Pension Liability	June 30, 2019
Membership	
Number of	
- Service Retirements	293
- Survivors	74
- Disability Retirements	16
- Deferred Retirements	19
- Terminated other non-vested	1
- Active Members	315
- Total	718
Covered-Employee Payroll	$ 50,164 [1]
Net Pension Liability	
Total Pension Liability	$ 391,146
Plan Fiduciary Net Position	212,262
Net Pension Liability	$ 178,884
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	54.27%
Net Pension Liability as a Percentage of Covered-Employee Payroll	356.60%
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	3.13% [2]
Last year ending June 30 in the 2020 to 2119 projection period for which projected benefit payments are fully funded	2119
Total Pension Expense/(Income)	$ 8,656

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	$ 2,924	$ 1,982
Changes in assumptions	4,662	17,152
Net difference between projected and actual earnings on pension plan investments	3,122	8,285
Total	$ 10,708	$ 27,419

[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, 2019.

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 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/financial-information 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 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 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 29 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

GASB Statement Nos. 67 and 68 require that an actuarial valuation to determine the total pension liability be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. 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, 2019 and a measurement date of June 30, 2019.

Single Discount Rate

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

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 3.13% (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, 2019 (Dollars in Thousands)

A. Expense

1.	Service Cost	$	9,881
2.	Interest on the Total Pension Liability		27,769
3.	Current-Period Benefit Changes		-
4.	Employee Contributions (made negative for addition here)		(4,049)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(14,982)
6.	Pension Plan Administrative Expense		87
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		161
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		-
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.50%) and actual earnings on Pension Plan Investments		
	Arising from Current Reporting Period		98
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**18,965**
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	$	(154)
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		(10,481)
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		326
15.	**Total Pension Expense / (Income)**	**$**	**8,656**

Statement of Outflows and Inflows
Arising from Current Reporting Period
Fiscal Year Ended June 30, 2019 (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	$	804
2. Assumption Changes (gains) or losses		-
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		161
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes		-
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	161
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	$	643
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes		-
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	643
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	491
2. Recognition period for Assets {in years}		5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets		98
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	393

Statement of Outflows and Inflows
Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30, 2019 (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	$ 8,543	$ 19,017	$ (10,474)
2. Due to Assets	4,018	3,594	424
3. Total	$ 12,561	$ 22,611	$ (10,050)

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	$ 1,873	$ 1,866	$ 7
2. Assumption Changes	6,670	17,151	(10,481)
3. Net Difference between projected and actual earnings on pension plan investments	4,018	3,594	424
4. Total	**$ 12,561**	**$ 22,611**	**$ (10,050)**

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	$ 2,924	$ 1,982	$ 942
2. Assumption Changes	4,662	17,152	(12,490)
3. Net Difference between projected and actual earnings on pension plan investments*	3,122	8,285	(5,163)
4. Total	**$ 10,708**	**$ 27,419**	**$ (16,711)**

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
2020	$ (14,707)
2021	(1,711)
2022	(552)
2023	259
2024	-
Thereafter	-
Total	**$ (16,711)**

** 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, 2019 (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					
2015	$ (4,366)	5.0000	$ (874)	$ 0	0.0000
2016	7,135	5.0000	1,427	1,427	1.0000
2017	(4,958)	5.0000	(992)	(1,982)	2.0000
2018	1,424	5.0000	285	854	3.0000
2019	804	5.0000	161	643	4.0000
Total			**$ 7**	**$ 942**	
Deferred Outflow (Inflow) Due to Assumption Changes					
2015	$ 21,696	5.0000	$ 4,340	$ 0	0.0000
2016	(85,756)	5.0000	(17,151)	(17,152)	1.0000
2017	11,652	5.0000	2,330	4,662	2.0000
Total			**$ (10,481)**	**$ (12,490)**	
Deferred Outflow (Inflow) Due to Differences Between Projected and Actual Earnings on Plan Investments					
2015	$ 5,959	5.0000	$ 1,191	$ 0	0.0000
2016	13,642	5.0000	2,729	2,729	1.0000
2017	(12,492)	5.0000	(2,498)	(4,998)	2.0000
2018	(5,479)	5.0000	(1,096)	(3,287)	3.0000
2019	491	5.0000	98	393	4.0000
Total			**$ 424**	**$ (5,163)**	

Statement of Fiduciary Net Position as of June 30, 2019 (Dollars in Thousands)

Assets		June 30, 2019
Cash & Short-term Investments	$	6,674
Receivables		304
Investment Pools (at fair value)		205,414
Securities Lending Collateral		15,730
Capital Assets		-
Total Assets	**$**	**228,122**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(15,860)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**212,262**

Statement of Changes in Fiduciary Net Position for the Fiscal Year Ended June 30, 2019 (Dollars in Thousands)

1. Net position at market value at beginning of year	**$**	**201,755**
Additions		
2. Contributions		
a. Employee	$	4,049
b. Employer		11,287
c. Other sources		6,000
d. Total contributions	$	21,336
3. Investment income		
a. Investment income/(loss)	$	14,694
b. Investment expenses		(203)
c. Net investment income/(loss)	$	14,491
4. Other Additions		-
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**35,827**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(25,233)
b. Refunds		-
c. Total benefits paid	$	(25,233)
7. Expenses		
a. Other deductions	$	-
b. Administrative		(87)
c. Total expenses	$	(87)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(25,320)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**10,507**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**212,262**
11. State Board of Investment calculated annual investment return for the Judges Retirement Fund*		7.2%

** The fiscal year 2019 investment return for the Combined Funds is 7.3%.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2019 (Dollars in Thousands)

A. Total pension liability			
1. Service Cost	$	9,881	
2. Interest on the Total Pension Liability		27,769	
3. Changes of benefit terms		-	
4. Difference between expected and actual experience of the Total Pension Liability		804	(1)
5. Changes of assumptions		-	
6. Benefit payments, including refunds of employee contributions		(25,233)	
7. Net change in total pension liability	$	13,221	
8. Total pension liability – beginning		377,925	
9. Total pension liability – ending	**$**	**391,146**	
B. Plan fiduciary net position			
1. Contributions – employer	$	17,287	(2)
2. Contributions – employee		4,049	
3. Net investment income		14,491	
4. Benefit payments, including refunds of employee contributions		(25,233)	
5. Pension Plan Administrative Expense		(87)	
6. Other changes		-	
7. Net change in plan fiduciary net position	$	10,507	
8. Plan fiduciary net position – beginning		201,755	
9. Plan fiduciary net position – ending	**$**	**212,262**	
C. Net pension liability, *A.9 - B.9.*	**$**	**178,884**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9 / A.9.*		**54.27%**	
E. Covered-employee payroll	**$**	**50,164**	(3)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**356.60%**	

(1) *Includes impact of changes in expected timing of future post-retirement benefit increases.*
(2) *Includes $6 million supplemental state aid.*
(3) *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,	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total Pension Liability										
Service Cost	$ 9,881	$ 9,857	$ 9,483	$ 13,711	$ 12,251	$ 12,075				
Interest on the Total Pension Liability	27,769	26,746	25,367	21,349	21,773	20,535				
Benefit Changes	-	-	-	-	0	0				
Experience[1]	804	1,424	(4,958)	7,135	(4,366)	5,080				
Assumption Changes	-	-	11,652	(85,756)	21,696	(8,416)				
Benefit Payments	(25,233)	(23,585)	(22,785)	(22,378)	(21,893)	(20,802)				
Refunds	-	-	(309)	-	0	0				
Net Change in Total Pension Liability	$ 13,221	$ 14,442	$ 18,450	$ (65,939)	29,461	8,472				
Total Pension Liability - Beginning	377,925	363,483	345,033	410,972	381,511	373,039				
Total Pension Liability - Ending (a)	**$ 391,146**	**$ 377,925**	**$ 363,483**	**$ 345,033**	**$ 410,972**	**$ 381,511**				
Plan Fiduciary Net Position										
Employer Contributions [2]	$ 17,287	$ 17,027	$ 13,758	$ 10,219	$ 9,776	$ 9,426				
Employee Contributions	4,049	3,973	3,932	3,763	3,629	3,578				
Pension Plan Net Investment Income	14,491	19,265	24,729	(186)	7,572	28,011				
Benefit Payments	(25,233)	(23,585)	(22,785)	(22,378)	(21,893)	(20,802)				
Refunds	-	-	(309)	-	0	0				
Pension Plan Administrative Expense	(87)	(66)	(89)	(93)	(60)	(55)				
Other Changes	-	-	-	-	0	0				
Net Change in Plan Fiduciary Net Position	**$ 10,507**	**$ 16,614**	**$ 19,236**	**$ (8,675)**	**(976)**	**20,158**				
Plan Fiduciary Net Position - Beginning	**$ 201,755**	**$ 185,141**	**$ 165,905**	**$ 174,580**	**175,556**	**155,398**				
Plan Fiduciary Net Position - Ending (b)	**$ 212,262**	**$ 201,755**	**$ 185,141**	**$ 165,905**	**$ 174,580**	**$ 175,556**				
Net Pension Liability - Ending (a) - (b)	**$ 178,884**	**$ 176,170**	**$ 178,342**	**$ 179,128**	**236,392**	**205,955**				
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**54.27 %**	**53.38 %**	**50.94 %**	**48.08 %**	**42.48 %**	**46.02 %**				
Covered-Employee Payroll[3]	**$ 50,164**	**$ 49,009**	**$ 47,813**	**$ 45,418**	**$ 43,449**	**$ 41,893**				
Net Pension Liability as a Percentage of Covered-Employee Payroll	**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 (a)	Plan Net Position (b)	Net Pension Liability (a) - (b) = (c)	Plan Net Position as a % of Total Pension Liability (b)/(c)	Covered-Employee Payroll (d)	Net Pension Liability as a % of Covered-Employee Payroll (c)/(d)
2010						
2011						
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

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 Contributions as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b)/(d)
2010	$ 9,400	$ 8,283	$ 1,117	$ 39,291	21.08%
2011	9,804	8,297	1,507	40,473	20.50
2012	9,879	7,922	1,957	38,644 [2]	20.50
2013	13,524	8,177	5,347	39,888 [2]	20.50
2014	14,193	9,426	4,767	41,893 [2]	22.50
2015	14,298	9,776	4,522	43,449 [2]	22.50
2016	15,644	10,219	5,425	45,418 [2]	22.50
2017	16,790	13,758 [3]	3,032	47,813 [2]	28.77
2018	18,032	17,027 [3]	1,005	49,009 [2]	34.74
2019	17,491	17,287 [3]	204	50,164 [2]	34.46

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Fiscal Year Ending June 30, 2019 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, 2018
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	30 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 2037, 2% per year from 2038 through 2051 and 2.5% per year thereafter.
	See separate funding actuarial valuation report as of July 1, 2018 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/actuarial-reports.

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

Fiscal Year Ending June 30,	Annual Return[1]
2010	
2011	
2012	
2013	
2014	18.7 %
2015	4.5
2016	-0.1
2017	15.2
2018	10.5
2019	7.2

[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, 2019, the annual money-weighted rate of return for the Judges Retirement Fund was 7.20%. 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, 2019, 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 for the State Employees Retirement Fund dated June 27, 2019.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

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 the 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 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 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	$430,855	$391,146	$357,140
Net Position Restricted for Pensions	212,262	212,262	212,262
Net Pension Liabitliy	**$218,593**	**$178,884**	**$144,878**

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	**$ 377,925**	**$ 201,755**	**$ 176,170**	**$ 21,974**	**$ 50,030**	
Changes for the Year:						
Service Cost	$ 9,881		$ 9,881			$ 9,881
Interest on Total Pension Liability	27,769		27,769			27,769
Interest on Plan Fiduciary Net Position		$ 14,982 (1)	(14,982)			(14,982)
Changes in Benefit Terms						
Liability Experience Gains and Losses	804		804	$ 643	$ -	161
Changes in Assumptions	-		-			-
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(1,712)	(1,866)	(154)
Assumption Changes				(6,670)	(17,151)	(10,481)
Investment Gains/(Losses)				(3,920)	(3,594)	326
Contributions - Employer		17,287	(17,287)			
Contributions - Employees		4,049	(4,049)			(4,049)
Asset Gain/(Loss)		(491) (1)	491	393	-	98
Benefit Payments and Refunds	(25,233)	(25,233)	-			
Administrative Expenses		(87)	87			87
Other Changes						
Net Changes	**$ 13,221**	**$ 10,507**	**$ 2,714**	**$ (11,266)**	**$ (22,611)**	**$ 8,656**
Balance End of Year	**$ 391,146**	**$ 212,262**	**$ 178,884**	**$ 10,708**	**$ 27,419**	

(1) The sum of these items in column (b) equals the net investment income of $14,491.

Summary of Population Statistics

		Terminated		Recipients			
	Actives*	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2018	**317**	**15**	**0**	**272**	**16**	**81**	**701**
New Members	28	0	0	0	0	0	**28**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	(1)	0	1	0	0	0	**0**
Service retirements	(23)	(1)	0	24	0	0	**0**
Terminated deferred	(5)	5	0	0	0	0	**0**
Terminated refund/transfer	0	0	0	0	0	0	**0**
Deaths	(1)	0	0	(6)	0	(8)	**(15)**
New beneficiary	0	0	0	0	0	2	**2**
Disabled	0	0	0	0	0	0	**0**
Unexpected status changes	0	0	0	3	0	(1)	**2**
Net change	(2)	4	1	21	0	(7)	**17**
Members on 6/30/2019	**315**	**19**	**1**	**293**	**16**	**74**	**718**

* *Includes 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	Since January 1, 2014, benefit recipients receive annual 1.75% benefit increases. If the accrued liability funding ratio reaches or exceeds 70% for two consecutive years (on a Market Value of Assets basis), the benefit increase will revert to 2.00%. If the accrued liability funding ratio reaches or exceeds 90% for two consecutive years (on a Market Value of Assets basis), the benefit increase will revert to 2.50%.

Summary of Plan Provisions (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.
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, compounded daily. Beginning July 1, 2011, a member's contributions increase at 4.00% interest compounded daily. Beginning July 1, 2018, a member's contributions increase at 3.00% interest compounded daily.

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, compounded daily. Beginning July 1, 2011, a member's contributions increase at 4.00% interest compounded daily. Beginning July 1, 2018, a member's contributions increase at 3.00% interest compounded daily. 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	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.

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 1.75% post-retirement benefit increase. If the funding ratio (determined on a market value of assets basis) reaches 70% (based on a 2.00% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will increase to 2.00%, if the funding ratio reaches 90% (based on a 2.50% post-retirement benefit increase assumption) for two consecutive years, the benefit increase reverts to 2.50%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns of 7.50%
- Liabilities and normal cost based on statutory funding assumptions
    - Discount rate of 7.50%
    - Statutory salary increases of 2.50%
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The post-retirement benefit increase rate is assumed to be 1.75% per year until the funding ratio threshold required to pay a 2.00% post-retirement benefit increase is reached and is assumed to be 2.00% per year until the threshold required to pay a 2.50% post-retirement benefit increase is reached
- Current statutory contributions as directed by MSRS

Based on these assumptions and methods, the projection indicates that this plan is expected to pay 1.75% per annum through 2039, 2.00% per annum for the years 2040 through 2056, and 2.50% per annum thereafter. This assumption is reflected in our calculations.

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 July 26, 2016, and a review of inflation and investment return assumptions in the last experience study for the State Employees Retirement Fund, dated June 27, 2019.

Investment return	7.50% per annum.
Single discount rate	7.50% per annum.
Benefit increases after retirement	1.75% per annum through 2039, 2.00% per annum from 2040 to 2056, and 2.50% per annum thereafter.
Salary increases	2.50% per year.
Payroll growth	2.50% per year.
Inflation	2.50% per year.
Mortality rates	
Healthy pre-retirement	RP-2014 employee generational mortality table projected with mortality improvement Scale MP-2015 from a base year of 2006, white collar adjustment.
Healthy post-retirement	RP-2014 annuitant generational mortality table projected with mortality improvement Scale MP-2015 from a base year of 2006, white collar adjustment.
Disabled	RP-2014 annuitant generational mortality table projected with mortality improvement Scale MP-2015 from a base year of 2006, white collar adjustment.
Notes	The RP-2014 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	Account balances for deferred members accumulate interest until normal retirement date and are discounted back to the valuation date.
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	Females are assumed to be three years younger than their male spouses.
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 or gender. In cases where submitted data was missing or incomplete, the following assumptions, based on average results for applicable members at the time of the last experience study, were applied: <u>Data for active members</u>: There were seven 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 $157,159 for the July 1, 2018 to June 30, 2019 plan year. There were no members reported with missing service. There were no members reported with a missing or invalid gender. <u>Data for terminated members</u>: There were no members reported without a benefit and no members reported with a missing or invalid gender.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members	Data for members receiving benefits: There was one member reported with a missing gender. We assumed male gender for retirees and female gender for survivors. There were three 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 three 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 retired members reported with a survivor option and an invalid or missing survivor gender (42 members) and/or survivor date of birth (34 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid. There were no survivors reported on the data file with an expired benefit.
Changes in actuarial assumptions	The assumed post-retirement benefit increase rate was changed from 1.75% through 2037, 2.00% for 2038 through 2051, and 2.50% thereafter to 1.75% through 2039, 2.00% for 2040 through 2056, and 2.50% thereafter. For accounting purposes, this change was treated as a difference between expected and actual experience.

Summary of Actuarial Assumptions (Concluded)

Age in 2019	Percentage of Members Dying each Year*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality**	
	Male	Female	Male	Female	Male	Female
20	0.02%	0.01%	0.02%	0.01%	0.02%	0.01%
25	0.03	0.02	0.03	0.01	0.03	0.02
30	0.05	0.05	0.03	0.02	0.05	0.05
35	0.07	0.08	0.03	0.03	0.07	0.08
40	0.11	0.11	0.04	0.03	0.11	0.11
45	0.16	0.14	0.06	0.05	0.16	0.14
50	0.24	0.19	0.10	0.08	0.24	0.19
55	0.36	0.27	0.18	0.14	0.36	0.27
60	0.50	0.39	0.32	0.21	0.50	0.39
65	0.73	0.63	0.56	0.30	0.73	0.63
70	1.18	1.00	0.98	0.52	1.18	1.00
75	2.06	1.69	1.76	0.91	2.06	1.69
80	3.66	3.00	3.16	1.63	3.66	3.00
85	6.73	5.50	6.57	4.35	6.73	5.50
90	12.34	10.05	12.48	9.73	12.34	10.05

* *Generally, mortality rates are expected to increase as age increases. These standard mortality rates have been adjusted slightly to prevent decreasing mortality rates. If the rates were not adjusted as described, we would not expect the valuation results to be materially different.*

** *Rates are adjusted for mortality improvements using Scale MP-2015 from a base year of 2006.*

Age	Percentage of Eligible Members Retiring each Year			
	Disability Retirement			
	Male	Female	Age	Retirement
20	0.00%	0.00%	60	0%
25	0.00	0.00	61	0
30	0.00	0.00	62	8
35	0.00	0.00	63	8
40	0.01	0.01	64	5
45	0.03	0.03	65	20
50	0.05	0.05	66	23
55	0.12	0.12	67	23
60	0.31	0.31	68	20
65	0.00	0.00	69	20
70	0.00	0.00	70	100

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 7.50%; the municipal bond rate is 3.13% (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, 2019 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)

Fiscal Year Ending	Projected Covered-Employee Payroll			Projected Contributions				
	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*	Additional State Contributions	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)		(g) = (d) + (e) + (f)
2019	$ 50,164		$ 50,164					
2020	50,756		50,756	$ 4,058	$ 11,420		$ 6,000	$ 21,478
2021	49,350	$ 2,674	52,024	3,930	11,104	$ 291	6,000	21,325
2022	47,326	5,999	53,325	3,751	10,648	654	6,000	21,053
2023	45,200	9,458	54,658	3,566	10,170	1,035	6,000	20,771
2024	43,266	12,759	56,025	3,397	9,735	1,401	6,000	20,533
2025	41,421	16,004	57,425	3,237	9,320	1,763	6,000	20,320
2026	39,556	19,305	58,861	3,077	8,900	2,135	6,000	20,112
2027	37,672	22,660	60,332	2,916	8,476	2,514	6,000	19,906
2028	35,752	26,089	61,841	2,754	8,044	2,904	6,000	19,702
2029	33,625	29,762	63,387	2,578	7,566	3,324	6,000	19,468
2030	31,256	33,715	64,971	2,385	7,033	3,779	6,000	19,197
2031	28,966	37,630	66,596	2,199	6,517	4,232	6,000	18,948
2032	26,735	41,526	68,261	2,020	6,015	4,685	6,000	18,720
2033	24,437	45,530	69,967	1,837	5,498	5,154	6,000	18,489
2034	22,230	49,486	71,716	1,663	5,002	5,621	6,000	18,286
2035	20,191	53,318	73,509	1,503	4,543	6,077	6,000	18,123
2036	18,079	57,268	75,347	1,339	4,068	6,548	6,000	17,955
2037	15,803	61,428	77,231	1,165	3,556	7,047	6,000	17,768
2038	13,698	65,463	79,161	1,005	3,082	7,535	6,000	17,622
2039	11,875	69,265	81,140	866	2,672	7,999	6,000	17,537
2040	10,227	72,942	83,169	742	2,301	8,451	6,000	17,494
2041	8,620	76,628	85,248	623	1,940	8,907	6,000	17,470
2042	7,150	80,229	87,379	514	1,609	9,356	6,000	17,479
2043	5,776	83,788	89,564	413	1,300	9,802	6,000	17,515
2044	4,550	87,253	91,803	324	1,024	10,241	6,000	17,589
2045	3,595	90,503	94,098	254	809	10,656	6,000	17,719
2046	2,662	93,788	96,450	187	599	11,078	6,000	17,864
2047	1,813	97,049	98,862	127	408	11,500	6,000	18,035
2048	1,224	100,109	101,333	86	275	11,863	6,000	18,224
2049	839	103,028	103,867	59	189	12,209	-	12,457
2050	524	105,939	106,463	37	118	12,554	-	12,709
2051	269	108,856	109,125	19	61	12,899	-	12,979
2052	126	111,727	111,853	9	28	13,240	-	13,277
2053	40	114,609	114,649	3	9	13,581	-	13,593
2054	-	117,515	117,515	-	-	13,926	-	13,926
2055	-	120,453	120,453	-	-	14,274	-	14,274
2056	-	123,465	123,465	-	-	14,631	-	14,631
2057	-	126,551	126,551	-	-	14,996	-	14,996
2058	-	129,715	129,715	-	-	15,371	-	15,371
2059	-	132,958	132,958	-	-	15,756	-	15,756
2060	-	136,282	136,282	-	-	16,149	-	16,149
2061	-	139,689	139,689	-	-	16,553	-	16,553
2062	-	143,181	143,181	-	-	16,967	-	16,967
2063	-	146,761	146,761	-	-	17,391	-	17,391
2064	-	150,430	150,430	-	-	17,826	-	17,826
2065	-	154,190	154,190	-	-	18,272	-	18,272
2066	-	158,045	158,045	-	-	18,728	-	18,728
2067	-	161,996	161,996	-	-	19,197	-	19,197
2068	-	166,046	166,046	-	-	19,676	-	19,676
2069	-	170,197	170,197	-	-	20,168	-	20,168

* *Equal to total contributions (29.50% of payroll for new employees) net of normal cost and expenses. Normal cost and expenses initially total 19.67% of pay but trend down over the projection period (based on the projection assumptions) due to the recognition of lower normal costs for Judges hired after June 30, 2013.*

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)
2070	$ -	$ 174,452	$ 174,452	$ -	$ -	$ 20,673	$ -	$ 20,673
2071	-	178,814	178,814	-	-	21,189	-	21,189
2072	-	183,284	183,284	-	-	21,719	-	21,719
2073	-	187,866	187,866	-	-	22,262	-	22,262
2074	-	192,563	192,563	-	-	22,819	-	22,819
2075	-	197,377	197,377	-	-	23,389	-	23,389
2076	-	202,311	202,311	-	-	23,974	-	23,974
2077	-	207,369	207,369	-	-	24,573	-	24,573
2078	-	212,553	212,553	-	-	25,188	-	25,188
2079	-	217,867	217,867	-	-	25,817	-	25,817
2080	-	223,314	223,314	-	-	26,463	-	26,463
2081	-	228,897	228,897	-	-	27,124	-	27,124
2082	-	234,619	234,619	-	-	27,802	-	27,802
2083	-	240,484	240,484	-	-	28,497	-	28,497
2084	-	246,497	246,497	-	-	29,210	-	29,210
2085	-	252,659	252,659	-	-	29,940	-	29,940
2086	-	258,975	258,975	-	-	30,689	-	30,689
2087	-	265,450	265,450	-	-	31,456	-	31,456
2088	-	272,086	272,086	-	-	32,242	-	32,242
2089	-	278,888	278,888	-	-	33,048	-	33,048
2090	-	285,860	285,860	-	-	33,874	-	33,874
2091	-	293,007	293,007	-	-	34,721	-	34,721
2092	-	300,332	300,332	-	-	35,589	-	35,589
2093	-	307,840	307,840	-	-	36,479	-	36,479
2094	-	315,536	315,536	-	-	37,391	-	37,391
2095	-	323,425	323,425	-	-	38,326	-	38,326
2096	-	331,510	331,510	-	-	39,284	-	39,284
2097	-	339,798	339,798	-	-	40,266	-	40,266
2098	-	348,293	348,293	-	-	41,273	-	41,273
2099	-	357,000	357,000	-	-	42,305	-	42,305
2100	-	365,925	365,925	-	-	43,362	-	43,362
2101	-	375,074	375,074	-	-	44,446	-	44,446
2102	-	384,450	384,450	-	-	45,557	-	45,557
2103	-	394,062	394,062	-	-	46,696	-	46,696
2104	-	403,913	403,913	-	-	47,864	-	47,864
2105	-	414,011	414,011	-	-	49,060	-	49,060
2106	-	424,361	424,361	-	-	50,287	-	50,287
2107	-	434,970	434,970	-	-	51,544	-	51,544
2108	-	445,845	445,845	-	-	52,833	-	52,833
2109	-	456,991	456,991	-	-	54,153	-	54,153
2110	-	468,416	468,416	-	-	55,507	-	55,507
2111	-	480,126	480,126	-	-	56,895	-	56,895
2112	-	492,129	492,129	-	-	58,317	-	58,317
2113	-	504,432	504,432	-	-	59,775	-	59,775
2114	-	517,043	517,043	-	-	61,270	-	61,270
2115	-	529,969	529,969	-	-	62,801	-	62,801
2116	-	543,218	543,218	-	-	64,371	-	64,371
2117	-	556,799	556,799	-	-	65,981	-	65,981
2118	-	570,719	570,719	-	-	67,630	-	67,630
2119	-	584,987	584,987	-	-	69,964	-	69,964

* *Equal to total contributions (29.50% of payroll for new employees) net of normal cost and expenses. Normal cost and expenses initially total 19.67% of pay but trend down over the projection period (based on the projection assumptions) due to the recognition of lower normal costs for Judges hired after June 30, 2013.*

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

Fiscal Year Ending	Projected Beginning Plan Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.50%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2020	$ 212,262	$ 21,478	$ 26,287	$ 86	$ 15,739	$ 223,106
2021	223,106	21,325	27,215	84	16,513	233,645
2022	233,645	21,053	28,518	80	17,246	243,346
2023	243,346	20,771	29,841	77	17,914	252,113
2024	252,113	20,533	31,144	74	18,515	259,943
2025	259,943	20,320	32,389	70	19,049	266,853
2026	266,853	20,112	33,501	67	19,519	272,916
2027	272,916	19,906	34,638	64	19,924	278,044
2028	278,044	19,702	35,762	61	20,260	282,183
2029	282,183	19,468	36,833	57	20,522	285,283
2030	285,283	19,197	38,052	53	20,700	287,075
2031	287,075	18,948	39,100	49	20,787	287,661
2032	287,661	18,720	40,069	45	20,787	287,054
2033	287,054	18,489	40,985	42	20,699	285,215
2034	285,215	18,286	41,687	38	20,528	282,304
2035	282,304	18,123	42,210	34	20,285	278,468
2036	278,468	17,955	42,717	31	19,972	273,647
2037	273,647	17,768	43,214	27	19,586	267,760
2038	267,760	17,622	43,501	23	19,128	260,986
2039	260,986	17,537	43,538	20	18,616	253,581
2040	253,581	17,494	43,477	17	18,061	245,642
2041	245,642	17,470	43,306	15	17,471	237,262
2042	237,262	17,479	42,955	12	16,856	228,630
2043	228,630	17,515	42,465	10	16,228	219,898
2044	219,898	17,589	41,809	8	15,600	211,270
2045	211,270	17,719	40,915	6	14,991	203,059
2046	203,059	17,864	39,941	5	14,416	195,393
2047	195,393	18,035	38,869	3	13,887	188,443
2048	188,443	18,224	37,611	2	13,419	182,473
2049	182,473	12,457	36,216	1	12,810	171,523
2050	171,523	12,709	34,768	1	12,052	161,515
2051	161,515	12,979	33,278	-	11,366	152,582
2052	152,582	13,277	31,732	-	10,764	144,891
2053	144,891	13,593	30,164	-	10,256	138,576
2054	138,576	13,926	28,586	-	9,853	133,769
2055	133,769	14,274	27,007	-	9,563	130,599
2056	130,599	14,631	25,452	-	9,396	129,174
2057	129,174	14,996	23,979	-	9,357	129,548
2058	129,548	15,371	22,582	-	9,450	131,787
2059	131,787	15,756	21,201	-	9,683	136,025
2060	136,025	16,149	19,839	-	10,066	142,401
2061	142,401	16,553	18,500	-	10,608	151,062
2062	151,062	16,967	17,185	-	11,321	162,165
2063	162,165	17,391	15,898	-	12,217	175,875
2064	175,875	17,826	14,641	-	13,308	192,368
2065	192,368	18,272	13,417	-	14,606	211,829
2066	211,829	18,728	12,231	-	16,126	234,452
2067	234,452	19,197	11,086	-	17,883	260,446
2068	260,446	19,676	9,988	-	19,890	290,024
2069	290,024	20,168	8,940	-	22,165	323,417

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 7.50%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2070	$ 323,417	$ 20,673	$ 7,948	$ -	$ 24,725	$ 360,867
2071	360,867	21,189	7,015	-	27,587	402,628
2072	402,628	21,719	6,144	-	30,771	448,974
2073	448,974	22,262	5,338	-	34,296	500,194
2074	500,194	22,819	4,596	-	38,186	556,603
2075	556,603	23,389	3,920	-	42,462	618,534
2076	618,534	23,974	3,311	-	47,151	686,348
2077	686,348	24,573	2,766	-	52,279	760,434
2078	760,434	25,188	2,285	-	57,876	841,213
2079	841,213	25,817	1,864	-	63,973	929,139
2080	929,139	26,463	1,500	-	70,605	1,024,707
2081	1,024,707	27,124	1,190	-	77,808	1,128,449
2082	1,128,449	27,802	930	-	85,623	1,240,944
2083	1,240,944	28,497	715	-	94,094	1,362,820
2084	1,362,820	29,210	540	-	103,267	1,494,757
2085	1,494,757	29,940	400	-	113,194	1,637,491
2086	1,637,491	30,689	291	-	123,931	1,791,820
2087	1,791,820	31,456	207	-	135,537	1,958,606
2088	1,958,606	32,242	143	-	148,077	2,138,782
2089	2,138,782	33,048	97	-	161,622	2,333,355
2090	2,333,355	33,874	64	-	176,247	2,543,412
2091	2,543,412	34,721	41	-	192,033	2,770,125
2092	2,770,125	35,589	26	-	209,069	3,014,757
2093	3,014,757	36,479	15	-	227,449	3,278,670
2094	3,278,670	37,391	9	-	247,277	3,563,329
2095	3,563,329	38,326	5	-	268,661	3,870,311
2096	3,870,311	39,284	3	-	291,720	4,201,312
2097	4,201,312	40,266	1	-	316,581	4,558,158
2098	4,558,158	41,273	1	-	343,382	4,942,812
2099	4,942,812	42,305	-	-	372,269	5,357,386
2100	5,357,386	43,362	-	-	403,400	5,804,148
2101	5,804,148	44,446	-	-	436,948	6,285,542
2102	6,285,542	45,557	-	-	473,093	6,804,192
2103	6,804,192	46,696	-	-	512,034	7,362,922
2104	7,362,922	47,864	-	-	553,981	7,964,767
2105	7,964,767	49,060	-	-	599,164	8,612,991
2106	8,612,991	50,287	-	-	647,826	9,311,104
2107	9,311,104	51,544	-	-	700,231	10,062,879
2108	10,062,879	52,833	-	-	756,661	10,872,373
2109	10,872,373	54,153	-	-	817,422	11,743,948
2110	11,743,948	55,507	-	-	882,840	12,682,295
2111	12,682,295	56,895	-	-	953,267	13,692,457
2112	13,692,457	58,317	-	-	1,029,081	14,779,855
2113	14,779,855	59,775	-	-	1,110,690	15,950,320
2114	15,950,320	61,270	-	-	1,198,530	17,210,120
2115	17,210,120	62,801	-	-	1,293,071	18,565,992
2116	18,565,992	64,371	-	-	1,394,820	20,025,183
2117	20,025,183	65,981	-	-	1,504,318	21,595,482
2118	21,595,482	67,630	-	-	1,622,151	23,285,263
2119	23,285,263	69,964	-	-	1,748,971	25,104,198

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	$ 212,262	$ 26,287	$ 26,287	$ -	$ 25,354	$ -	$ 25,354
2019	223,106	27,215	27,215	-	24,417	-	24,417
2020	233,645	28,518	28,518	-	23,801	-	23,801
2021	243,346	29,841	29,841	-	23,168	-	23,168
2022	252,113	31,144	31,144	-	22,492	-	22,492
2023	259,943	32,389	32,389	-	21,759	-	21,759
2024	266,853	33,501	33,501	-	20,937	-	20,937
2025	272,916	34,638	34,638	-	20,136	-	20,136
2026	278,044	35,762	35,762	-	19,340	-	19,340
2027	282,183	36,833	36,833	-	18,529	-	18,529
2028	285,283	38,052	38,052	-	17,807	-	17,807
2029	287,075	39,100	39,100	-	17,021	-	17,021
2030	287,661	40,069	40,069	-	16,226	-	16,226
2031	287,054	40,985	40,985	-	15,439	-	15,439
2032	285,215	41,687	41,687	-	14,608	-	14,608
2033	282,304	42,210	42,210	-	13,759	-	13,759
2034	278,468	42,717	42,717	-	12,953	-	12,953
2035	273,647	43,214	43,214	-	12,189	-	12,189
2036	267,760	43,501	43,501	-	11,414	-	11,414
2037	260,986	43,538	43,538	-	10,627	-	10,627
2038	253,581	43,477	43,477	-	9,872	-	9,872
2039	245,642	43,306	43,306	-	9,147	-	9,147
2040	237,262	42,955	42,955	-	8,440	-	8,440
2041	228,630	42,465	42,465	-	7,761	-	7,761
2042	219,898	41,809	41,809	-	7,108	-	7,108
2043	211,270	40,915	40,915	-	6,471	-	6,471
2044	203,059	39,941	39,941	-	5,876	-	5,876
2045	195,393	38,869	38,869	-	5,320	-	5,320
2046	188,443	37,611	37,611	-	4,788	-	4,788
2047	182,473	36,216	36,216	-	4,289	-	4,289
2048	171,523	34,768	34,768	-	3,830	-	3,830
2049	161,515	33,278	33,278	-	3,410	-	3,410
2050	152,582	31,732	31,732	-	3,025	-	3,025
2051	144,891	30,164	30,164	-	2,675	-	2,675
2052	138,576	28,586	28,586	-	2,358	-	2,358
2053	133,769	27,007	27,007	-	2,072	-	2,072
2054	130,599	25,452	25,452	-	1,817	-	1,817
2055	129,174	23,979	23,979	-	1,592	-	1,592
2056	129,548	22,582	22,582	-	1,395	-	1,395
2057	131,787	21,201	21,201	-	1,218	-	1,218
2058	136,025	19,839	19,839	-	1,060	-	1,060
2059	142,401	18,500	18,500	-	920	-	920
2060	151,062	17,185	17,185	-	795	-	795
2061	162,165	15,898	15,898	-	684	-	684
2062	175,875	14,641	14,641	-	586	-	586
2063	192,368	13,417	13,417	-	500	-	500
2064	211,829	12,231	12,231	-	424	-	424
2065	234,452	11,086	11,086	-	357	-	357
2066	260,446	9,988	9,988	-	299	-	299
2067	290,024	8,940	8,940	-	249	-	249

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	$ 323,417	$ 7,948	$ 7,948	$ -	$ 25,354	$ -	$ 206
2069	360,867	7,015	7,015	-	24,417	-	169
2070	402,628	6,144	6,144	-	23,801	-	138
2071	448,974	5,338	5,338	-	23,168	-	111
2072	500,194	4,596	4,596	-	22,492	-	89
2073	556,603	3,920	3,920	-	21,759	-	71
2074	618,534	3,311	3,311	-	20,937	-	56
2075	686,348	2,766	2,766	-	20,136	-	43
2076	760,434	2,285	2,285	-	19,340	-	33
2077	841,213	1,864	1,864	-	18,529	-	25
2078	929,139	1,500	1,500	-	17,807	-	19
2079	1,024,707	1,190	1,190	-	17,021	-	14
2080	1,128,449	930	930	-	16,226	-	10
2081	1,240,944	715	715	-	15,439	-	7
2082	1,362,820	540	540	-	14,608	-	5
2083	1,494,757	400	400	-	13,759	-	4
2084	1,637,491	291	291	-	12,953	-	2
2085	1,791,820	207	207	-	12,189	-	2
2086	1,958,606	143	143	-	11,414	-	1
2087	2,138,782	97	97	-	10,627	-	1
2088	2,333,355	64	64	-	9,872	-	0
2089	2,543,412	41	41	-	9,147	-	0
2090	2,770,125	26	26	-	8,440	-	0
2091	3,014,757	15	15	-	7,761	-	0
2092	3,278,670	9	9	-	7,108	-	0
2093	3,563,329	5	5	-	6,471	-	0
2094	3,870,311	3	3	-	5,876	-	0
2095	4,201,312	1	1	-	5,320	-	0
2096	4,558,158	1	1	-	4,788	-	0
2097	4,942,812	-	-	-	4,289	-	0
2098	5,357,386	-	-	-	3,830	-	0
2099	5,804,148	-	-	-	3,410	-	0
2100	6,285,542	-	-	-	3,025	-	0
2101	6,804,192	-	-	-	2,675	-	0
2102	7,362,922	-	-	-	2,358	-	-
2103	7,964,767	-	-	-	2,072	-	-
2104	8,612,991	-	-	-	1,817	-	-
2105	9,311,104	-	-	-	1,592	-	-
2106	10,062,879	-	-	-	1,395	-	-
2107	10,872,373	-	-	-	1,218	-	-
2108	11,743,948	-	-	-	1,060	-	-
2109	12,682,295	-	-	-	920	-	-
2110	13,692,457	-	-	-	795	-	-
2111	14,779,855	-	-	-	684	-	-
2112	15,950,320	-	-	-	586	-	-
2113	17,210,120	-	-	-	500	-	-
2114	18,565,992	-	-	-	424	-	-
2115	20,025,183	-	-	-	357	-	-
2116	21,595,482	-	-	-	299	-	-
2117	23,285,263	-	-	-	249	-	-
				Totals	$ 461,304	$ -	$ 461,304

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 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 post-employment 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.