Minnesota State Retirement System
Judges Retirement Fund

GASB Statements No. 67 and No. 68
Accounting and Financial Reporting for Pensions
June 30, 2017

GRS

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December 1, 2017

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 statements.

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 obligations. 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 Statement No. 67 and No. 68 may produce significantly different results. The information in this report is calculated on a total plan basis. MSRS is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer, as applicable. This report may be provided to parties other than the Minnesota State Retirement System (MSRS) 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, 2017 for additional discussion of the nature of actuarial calculations and more information related to participant date, 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

Bonita J. Wurst

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

BBM/BJW:bd

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SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2017 (Dollars in Thousands)

	2017
Actuarial Valuation Date	June 30, 2017
Measurement Date of the Net Pension Liability	June 30, 2017
Membership	
Number of	
- Service Retirements	255
- Survivors	80
- Disability Retirements	16
- Deferred Retirements	15
- Terminated other non-vested	0
- Active Members	317
- Total	683
Covered-Employee Payroll	$ 47,813 [1]
Net Pension Liability	
Total Pension Liability	$ 363,483
Plan Fiduciary Net Position	185,141
Net Pension Liability	$ 178,342
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	50.94%
Net Pension Liability as a Percentage of Covered-Employee Payroll	373.00%
Development of the Single Discount Rate	
Single Discount Rate	7.50%
Long-Term Expected Rate of Investment Return	7.50%
Long-Term Municipal Bond Rate [2]	3.56%
Last year ending June 30 in the 2018 to 2117 projection period for which projected benefit payments are fully funded	2117
Total Pension Expense/(Income)	$ 5,396

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	$ 5,297	$ 5,713
Changes in assumptions	18,001	53,138
Net difference between projected and actual earnings on pension plan investments	10,569	13,204
Total	$ 33,867	$ 72,055

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

[2] *Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's '20-Year Municipal GO AA Index' as of June 30, 2017. See Section G for additional detail.*

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, 2017.

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, MN, 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% on the actuarial value of assets), 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 unfunded liability is expected to be paid off in approximately 40 years.
3. The funded status of the plan is expected to reach a 100% funded ratio in approximately 40 years.

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 actuarial 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 market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

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, 2017 and a measurement date of June 30, 2017.

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 3.56% (based on Fidelity Index's 20-Year Municipal GO AA Index as of June 30, 2017); and the resulting single discount rate is 7.50%. The long-term expected rate of return is based on reviews of inflation and investment assumptions, dated September 11, 2014 and September 11, 2017, and a recent asset liability study obtained by the Minnesota State Board of Investment.

SECTION B

FINANCIAL STATEMENTS

Statement of Pension Expense Under GASB Statement No. 68
Fiscal Year Ended June 30, 2017 (Dollars in Thousands)

A. Expense

1.	Service Cost	$	9,483
2.	Interest on the Total Pension Liability		25,367
3.	Current-Period Benefit Changes		-
4.	Employee Contributions (made negative for addition here)		(3,932)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(12,237)
6.	Pension Plan Administrative Expense		89
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		(992)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		2,330
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		(2,498)
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**17,610**
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	$	1,570
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		(14,495)
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		711
15.	**Total Pension Expense / (Income)**	**$**	**5,396**

Statement of Outflows and Inflows
Arising from Current Reporting Period
Fiscal Year Ended June 30, 2017 (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	$	(4,958)
2. Assumption Changes (gains) or losses		11,652
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		(992)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes		2,330
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	1,338
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	$	(3,966)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes		9,322
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	5,356
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(12,492)
2. Recognition period for Assets {in years}		5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets		(2,498)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(9,994)

Statement of Outflows and Inflows
Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30, 2017 (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	$ 9,112	$ 20,699	$ (11,587)
2. Due to Assets	3,920	5,707	(1,787)
3. Total	$ 13,032	$ 26,406	$ (13,374)

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	$ 2,443	$ 1,865	$ 578
2. Assumption Changes	6,669	18,834	(12,165)
3. Net Difference between projected and actual earnings on pension plan investments	3,920	5,707	(1,787)
4. Total	**$ 13,032**	**$ 26,406**	**$ (13,374)**

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	$ 5,297	$ 5,713	$ (416)
2. Assumption Changes	18,001	53,138	(35,137)
3. Net Difference between projected and actual earnings on pension plan investments*	10,569	13,204	(2,635)
4. Total	**$ 33,867**	**$ 72,055**	**$ (38,188)**

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
2018	$ (13,375)
2019	(9,499)
2020	(14,156)
2021	(1,158)
2022	-
Thereafter	-
Total	**$ (38,188)**

** 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.*

Statement of Fiduciary Net Position as of June 30, 2017 (Dollars in Thousands)

Assets		June 30, 2017
Cash & Short-term Investments	$	6,245
Receivables		236
Investment Pools (at fair value)		178,793
Securities Lending Collateral		18,943
Capital Assets		-
Total Assets	**$**	**204,217**
Total Deferred Outflows of Resources	**$**	**-**
Total Liabilities	**$**	**(19,076)**
Total Deferred Inflows of Resources	**$**	**-**
Net Position Restricted for Pensions	**$**	**185,141**

Statement of Changes in Fiduciary Net Position for the Fiscal Year Ended June 30, 2017 (Dollars in Thousands)

1. Net position at market value at beginning of year	**$**	**165,905**
Additions		
2. Contributions		
a. Employee	$	3,932
b. Employer		10,758
c. Other sources		3,000
d. Total contributions	$	17,690
3. Investment income		
a. Investment income/(loss)	$	24,921
b. Investment expenses		(192)
c. Net investment income/(loss)	$	24,729
4. Other Additions		-
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**42,419**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(22,785)
b. Refunds		(309)
c. Total benefits paid	$	(23,094)
7. Expenses		
a. Other deductions	$	-
b. Administrative		(89)
c. Total expenses	$	(89)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(23,183)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**19,236**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**185,141**
11. State Board of Investment calculated annual investment return for the Judges Retirement Fund*		15.2%

** The fiscal year 2017 investment return for the Combined Funds is 15.1%.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2017 (Dollars in Thousands)

A. Total pension liability			
1. Service Cost	$	9,483	
2. Interest on the Total Pension Liability		25,367	
3. Changes of benefit terms		-	
4. Difference between expected and actual experience of the Total Pension Liability		(4,958)	(1)
5. Changes of assumptions		11,652	(2)
6. Benefit payments, including refunds of employee contributions		(23,094)	
7. Net change in total pension liability	$	18,450	
8. Total pension liability – beginning		345,033	
9. Total pension liability – ending	**$**	**363,483**	
B. Plan fiduciary net position			
1. Contributions – employer	$	13,758	(3)
2. Contributions – employee		3,932	
3. Net investment income		24,729	
4. Benefit payments, including refunds of employee contributions		(23,094)	
5. Pension Plan Administrative Expense		(89)	
6. Other changes		-	
7. Net change in plan fiduciary net position	$	19,236	
8. Plan fiduciary net position – beginning		165,905	
9. Plan fiduciary net position – ending	**$**	**185,141**	
C. Net pension liability, *A.9 - B.9.*	**$**	**178,342**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9 / A.9.*		**50.94%**	
E. Covered-employee payroll	**$**	**47,813**	(4)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**373.00%**	

(1) Includes impact of changes in expected timing of future post-retirement benefit increases.
(2) Assumption changes are summarized on page 27.
(3) Includes $3 million supplemental state aid.
(4) 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,	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total Pension Liability										
Service Cost	$ 9,483	$ 13,711	$ 12,251	$ 12,075						
Interest on the Total Pension Liability	25,367	21,349	21,773	20,535						
Benefit Changes	-	-	-	-						
Difference between Expected and Actual Experience	(4,958) [1]	7,135	(4,366)	5,080						
Assumption Changes	11,652 [2]	(85,756)	21,696	(8,416)						
Benefit Payments	(22,785)	(22,378)	(21,893)	(20,802)						
Refunds	(309)	-	-	-						
Net Change in Total Pension Liability	$ 18,450	$ (65,939)	$ 29,461	$ 8,472						
Total Pension Liability - Beginning	345,033	410,972	381,511	373,039						
Total Pension Liability - Ending (a)	**$ 363,483**	**$ 345,033**	**$ 410,972**	**$ 381,511**						
Plan Fiduciary Net Position										
Employer Contributions	$ 13,758 [3]	$ 10,219	$ 9,776	$ 9,426						
Employee Contributions	3,932	3,763	3,629	3,578						
Pension Plan Net Investment Income	24,729	(186)	7,572	28,011						
Benefit Payments	(22,785)	(22,378)	(21,893)	(20,802)						
Refunds	(309)	-	-	-						
Pension Plan Administrative Expense	(89)	(93)	(60)	(55)						
Other Changes	-	-	-	0						
Net Change in Plan Fiduciary Net Position	**$ 19,236**	**$ (8,675)**	**$ (976)**	**$ 20,158**						
Plan Fiduciary Net Position - Beginning	**$ 165,905**	**$ 174,580**	**$ 175,556**	**$ 155,398**						
Plan Fiduciary Net Position - Ending (b)	**$ 185,141**	**$ 165,905**	**$ 174,580**	**$ 175,556**						
Net Pension Liability - Ending (a) - (b)	**$ 178,342**	**$ 179,128**	**$ 236,392**	**$ 205,955**						
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**50.94 %**	**48.08 %**	**42.48 %**	**46.02 %**						
Covered-Employee Payroll[4]	**$ 47,813**	**$ 45,418**	**$ 43,449**	**$ 41,893**						
Net Pension Liability as a Percentage of Covered-Employee Payroll	**373.00 %**	**394.40 %**	**544.07 %**	**491.62 %**						

[1] *Includes impact of changes in expected timing of future post-retirement benefit increases.*
[2] *Assumption changes are summarized on page 27.*
[3] *Includes $3 million supplemental state aid.*
[4] *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)
2008						
2009						
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

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)
2008	$ 10,045	$ 7,936	$ 2,109	$ 38,296	20.72%
2009	8,985	8,219	766	39,444	20.84
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	3,032	47,813 [2]	28.77

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Fiscal Year Ending June 30, 2017 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.
Valuation Date:	June 30, 2016
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	23 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Payroll Increases	2.75%
Salary Increases	2.75%
Investment Rate of Return	8.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study of the period 2007 - 2011, prepared by a former actuary.
Healthy Post-Retirement Mortality	RP-2000 annuitant generational mortality table, projected with mortality improvement scale AA, white collar adustment, set back one year for males and set back two years for females.
Other Information:	
Benefit Increases After Retirement	The post-retirement increase is assumed to be 1.75% per year through 2034, 2% per year from 2035 through 2045, and 2.5% per year thereafter. See separate funding actuarial valuation report as of July 1, 2016 for additional detail. To obtain this report, contact MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 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]
2008	
2009	
2010	
2011	
2012	
2013	
2014	18.66 %
2015	0.04
2016	(0.11)
2017	15.18

[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, 2017, the annual money-weighted rate of return for the Judges Retirement Fund was 15.18%. 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.

10-Year Schedule of Money-Weighted Investment Return

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

To request additional information about the computation of the annual money-weighted rate of return and the investments for the Minnesota Retirement Systems (including the investments for MSRS' defined benefit retirement funds), contact SBI at 60 Empire Drive, Suite 355, St. Paul, Minnesota, 55103, via email at minn.sbi@state.mn.us or telephone at (651) 296-3328.

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

Asset Allocation

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Best 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 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, 2017, these best estimates are summarized in the following table:

Asset Allocation

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	39.00%	5.10%
International Stocks	19.00	5.30
Bonds	20.00	0.75
Alternative Assets	20.00	5.90
Unallocated Cash	2.00	0.00
Total	100.00%	

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 reviews of inflation and investment return assumptions dated September 11, 2014 and September 11, 2017, and a recent asset liability study obtained by the SBI.

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, due to the additional state contributions reflected in the projection, 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. As a result, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the 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 single discount 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	$400,629	$363,483	$331,658
Net Position Restricted for Pensions	185,141	185,141	185,141
Net Pension Liabitliy	**$215,488**	**$178,342**	**$146,517**

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

In interpreting the above results, users should be aware that we do not consider 8.5% to be a reasonable assumption.

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	**$ 345,033**	**$ 165,905**	**$ 179,128**	**$ 35,247**	**$ 81,011**	
Changes for the Year:						
Service Cost	$ 9,483		$ 9,483			$ 9,483
Interest on Total Pension Liability	25,367		25,367			25,367
Interest on Plan Fiduciary Net Position [1]		$ 12,237	(12,237)			(12,237)
Changes in Benefit Terms						
Liability Experience Gains and Losses	(4,958)		(4,958)		$ 3,966	(992)
Changes in Assumptions	11,652		11,652	$ 9,322		2,330
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(2,443)	(873)	1,570
Assumption Changes				(4,339)	(18,834)	(14,495)
Investment Gains/(Losses)				(3,920)	(3,209)	711
Contributions - Employer		13,758	(13,758)			
Contributions - Employees		3,932	(3,932)			(3,932)
Asset Gain/(Loss) [1]		12,492	(12,492)		9,994	(2,498)
Benefit Payments and Refunds	(23,094)	(23,094)	-			
Administrative Expenses		(89)	89			89
Other Changes						
Net Changes	**$ 18,450**	**$ 19,236**	**$ (786)**	**$ (1,380)**	**$ (8,956)**	**$ 5,396**
Balance End of Year	**$ 363,483**	**$ 185,141**	**$ 178,342**	**$ 33,867**	**$ 72,055**	

(1) The sum of these items in column (b) equals the net investment income of $24,729.

Summary of Population Statistics

		Terminated		Recipients			
	Actives*	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2016	**311**	**17**	**0**	**250**	**20**	**80**	**678**
New members	19	0	0	0	0	0	**19**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	0	0	0	0	0	0	**0**
Service retirements	(12)	(2)	0	14	0	0	**0**
Terminated deferred	0	0	0	0	0	0	**0**
Terminated refund/transfer	(1)	0	0	0	0	0	**(1)**
Deaths	0	0	0	(9)	(4)	(3)	**(16)**
New beneficiary	0	0	0	0	0	3	**3**
Disabled	0	0	0	0	0	0	**0**
Unexpected status changes	0	0	0	0	0	0	**0**
Net change	6	(2)	0	5	(4)	0	**5**
Members on 6/30/2017	**317**	**15**	**0**	**255**	**16**	**80**	**683**

** 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	$3,000,000 for the year ending June 30, 2017, and $6,000,000 per year thereafter until the plan is fully funded.
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)

Early retirement	
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 contributions with 6.00% annual interest compounded daily until June 30, 2011, and 4.00% thereafter.

Summary of Plan Provisions (Concluded)

Termination	
Refund of contributions	
Age/Service requirement	Termination of service as a judge.
Amount	Member contributions with 6.00% annual interest compounded daily until June 30, 2011, and 4.00% thereafter. 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	Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2022 using scale AA, set back one year for males and set back two years for females, blended 80% males, and 6.50% interest.
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	None.

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 revert 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 8.00%
  - Statutory salary increases of 2.75%
- 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 (i.e., not including potential contribution increases under the contribution stabilizer statutes) 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 2038, 2.00% per annum for the years 2039 through 2053, 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 25, 2016, reviews of inflation and investment return assumptions, dated September 11, 2014 and September 11, 2017, and a recent asset liability study obtained by the SBI.

Investment return	7.50% per annum.
Single discount rate	7.50% per annum.
Benefit increases after retirement	1.75% per annum through 2038, 2.00% per annum from 2039 to 2053, 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. 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 were applied: Data for active members: There were 16 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 $149,605 for the July 1, 2016 to June 30, 2017 plan year. There were no members reported with missing service. Data for terminated members: There was 1 member reported without a benefit. We calculated the benefit for this member using the reported Average Salary, Credited Service and Termination Date provided.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members	Data for members receiving benefits: There were no members reported without a benefit. There were 2 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor and the member benefit already reflected the increase to the life annuity value (i.e., "bounce back"), if applicable. There were no retirees reported with a bounce back annuity and an unreasonable reduction factor. There were retired members reported with a survivor option and an invalid or missing survivor gender (44 members) and/or survivor date of birth (33 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 base mortality table for healthy and disabled annuitants and employees was changed from the RP-2000 fully generational table to the RP-2014 fully generational table (with a base year of 2006), with white collar adjustments. The mortality improvement scale was changed from Scale AA to Scale MP-2015. Assumed rates of retirement were changed as recommended in the July 25, 2016, experience study. The changes result in more unreduced (Normal) retirements and slightly less reduced (Early) retirements. Male disability incidence rates were decreased to equal female disability incidence rates. The assumed post-retirement benefit increase rate was changed from 1.75% through 2041, 2.00% for 2042 through 2054, and 2.50% thereafter to 1.75% through 2038, 2.00% for 2039 through 2053, 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 2017	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	0.04	0.02	0.03	0.01	0.04	0.02
30	0.05	0.05	0.03	0.02	0.05	0.05
35	0.08	0.08	0.03	0.03	0.08	0.08
40	0.11	0.12	0.04	0.03	0.11	0.12
45	0.17	0.15	0.06	0.05	0.17	0.15
50	0.25	0.20	0.11	0.09	0.25	0.20
55	0.38	0.27	0.19	0.14	0.38	0.27
60	0.51	0.39	0.32	0.21	0.51	0.39
65	0.74	0.64	0.56	0.31	0.74	0.64
70	1.21	1.03	1.00	0.53	1.21	1.03

* *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 "risk-free" 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 3.56% (based on Fidelity Index's 20-Year Municipal GO AA Index as of June 30, 2017). In describing their 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 Plan's Fiduciary Net Position was projected to be available to meet all projected future benefit payments of current active and inactive employees. 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. **The resulting single discount rate as of July 1, 2017 is 7.50%.**

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)
2017	$ 47,813		$ 47,813					
2018	48,825		48,825	$ 3,984	$ 10,986		$ 6,000	$ 20,970
2019	46,299	$ 3,746	50,045	3,759	10,417	$ 387	6,000	20,563
2020	43,381	7,916	51,297	3,505	9,761	821	6,000	20,087
2021	41,404	11,175	52,579	3,329	9,316	1,163	6,000	19,808
2022	39,268	14,625	53,893	3,141	8,835	1,529	6,000	19,505
2023	37,001	18,240	55,241	2,945	8,325	1,914	6,000	19,184
2024	34,836	21,786	56,622	2,759	7,838	2,296	6,000	18,893
2025	32,664	25,373	58,037	2,574	7,349	2,685	6,000	18,608
2026	30,609	28,879	59,488	2,400	6,887	3,068	6,000	18,355
2027	28,669	32,306	60,975	2,236	6,450	3,446	6,000	18,132
2028	26,736	35,764	62,500	2,075	6,015	3,831	6,000	17,921
2029	24,614	39,448	64,062	1,900	5,538	4,242	6,000	17,680
2030	22,278	43,386	65,664	1,711	5,012	4,685	6,000	17,408
2031	20,061	47,244	67,305	1,533	4,514	5,121	6,000	17,168
2032	18,060	50,928	68,988	1,373	4,063	5,543	6,000	16,979
2033	16,064	54,649	70,713	1,214	3,614	5,971	6,000	16,799
2034	14,148	58,333	72,481	1,064	3,183	6,399	6,000	16,646
2035	12,442	61,851	74,293	931	2,800	6,811	6,000	16,542
2036	10,735	65,415	76,150	799	2,415	7,232	6,000	16,446
2037	9,005	69,049	78,054	666	2,026	7,664	6,000	16,356
2038	7,498	72,507	80,005	552	1,687	8,079	6,000	16,318
2039	6,239	75,766	82,005	457	1,404	8,475	6,000	16,336
2040	5,193	78,862	84,055	378	1,168	8,855	6,000	16,401
2041	4,175	81,982	86,157	302	939	9,240	6,000	16,481
2042	3,284	85,027	88,311	236	739	9,620	6,000	16,595
2043	2,564	87,954	90,518	184	577	9,989	6,000	16,750
2044	1,967	90,814	92,781	140	442	10,354	6,000	16,936
2045	1,438	93,663	95,101	102	324	10,719	6,000	17,145
2046	903	96,575	97,478	64	203	11,093	6,000	17,360
2047	579	99,336	99,915	41	130	11,454	6,000	17,625
2048	409	102,004	102,413	29	92	11,761	6,000	17,882
2049	244	104,730	104,974	17	55	12,075	6,000	18,147
2050	77	107,521	107,598	5	17	12,397	6,000	18,419
2051	-	110,288	110,288	-	-	12,716	6,000	18,716
2052	-	113,045	113,045	-	-	13,034	6,000	19,034
2053	-	115,871	115,871	-	-	13,360	6,000	19,360
2054	-	118,768	118,768	-	-	13,694	6,000	19,694
2055	-	121,737	121,737	-	-	14,036	6,000	20,036
2056	-	124,781	124,781	-	-	14,387	6,000	20,387
2057	-	127,900	127,900	-	-	14,747	-	14,747
2058	-	131,098	131,098	-	-	15,116	-	15,116
2059	-	134,375	134,375	-	-	15,493	-	15,493
2060	-	137,734	137,734	-	-	15,881	-	15,881
2061	-	141,178	141,178	-	-	16,278	-	16,278
2062	-	144,707	144,707	-	-	16,685	-	16,685
2063	-	148,325	148,325	-	-	17,102	-	17,102
2064	-	152,033	152,033	-	-	17,529	-	17,529
2065	-	155,834	155,834	-	-	17,968	-	17,968
2066	-	159,730	159,730	-	-	18,417	-	18,417
2067	-	163,723	163,723	-	-	18,877	-	18,877

** Contributions related to future employees in excess of normal cost and expenses. Normal cost and expenses initially total 20.37% 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 (Concluded, 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)
2068	$ -	$ 167,816	$ 167,816	$ -	$ -	$ 19,349	$ -	$ 19,349
2069	-	172,011	172,011	-	-	19,833	-	19,833
2070	-	176,312	176,312	-	-	20,329	-	20,329
2071	-	180,719	180,719	-	-	20,837	-	20,837
2072	-	185,237	185,237	-	-	21,358	-	21,358
2073	-	189,868	189,868	-	-	21,892	-	21,892
2074	-	194,615	194,615	-	-	22,439	-	22,439
2075	-	199,481	199,481	-	-	23,000	-	23,000
2076	-	204,468	204,468	-	-	23,575	-	23,575
2077	-	209,579	209,579	-	-	24,164	-	24,164
2078	-	214,819	214,819	-	-	24,769	-	24,769
2079	-	220,189	220,189	-	-	25,388	-	25,388
2080	-	225,694	225,694	-	-	26,023	-	26,023
2081	-	231,336	231,336	-	-	26,673	-	26,673
2082	-	237,120	237,120	-	-	27,340	-	27,340
2083	-	243,048	243,048	-	-	28,023	-	28,023
2084	-	249,124	249,124	-	-	28,724	-	28,724
2085	-	255,352	255,352	-	-	29,442	-	29,442
2086	-	261,736	261,736	-	-	30,178	-	30,178
2087	-	268,279	268,279	-	-	30,933	-	30,933
2088	-	274,986	274,986	-	-	31,706	-	31,706
2089	-	281,861	281,861	-	-	32,499	-	32,499
2090	-	288,907	288,907	-	-	33,311	-	33,311
2091	-	296,130	296,130	-	-	34,144	-	34,144
2092	-	303,533	303,533	-	-	34,997	-	34,997
2093	-	311,122	311,122	-	-	35,872	-	35,872
2094	-	318,900	318,900	-	-	36,769	-	36,769
2095	-	326,872	326,872	-	-	37,688	-	37,688
2096	-	335,044	335,044	-	-	38,631	-	38,631
2097	-	343,420	343,420	-	-	39,596	-	39,596
2098	-	352,005	352,005	-	-	40,586	-	40,586
2099	-	360,806	360,806	-	-	41,601	-	41,601
2100	-	369,826	369,826	-	-	42,641	-	42,641
2101	-	379,071	379,071	-	-	43,707	-	43,707
2102	-	388,548	388,548	-	-	44,800	-	44,800
2103	-	398,262	398,262	-	-	45,920	-	45,920
2104	-	408,218	408,218	-	-	47,068	-	47,068
2105	-	418,424	418,424	-	-	48,244	-	48,244
2106	-	428,884	428,884	-	-	49,450	-	49,450
2107	-	439,607	439,607	-	-	50,687	-	50,687
2108	-	450,597	450,597	-	-	51,954	-	51,954
2109	-	461,862	461,862	-	-	53,253	-	53,253
2110	-	473,408	473,408	-	-	54,584	-	54,584
2111	-	485,243	485,243	-	-	55,949	-	55,949
2112	-	497,374	497,374	-	-	57,347	-	57,347
2113	-	509,809	509,809	-	-	58,781	-	58,781
2114	-	522,554	522,554	-	-	60,250	-	60,250
2115	-	535,618	535,618	-	-	61,757	-	61,757
2116	-	549,008	549,008	-	-	63,301	-	63,301
2117	-	562,734	562,734	-	-	65,502	-	65,502

** Contributions related to future employees in excess of normal cost and expenses. Normal cost and expenses initially total 20.37% 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)
2018	$ 185,141	$ 20,970	$ 23,143	$ 93	$ 13,802	$ 196,677
2019	196,677	20,563	24,635	88	14,598	207,115
2020	207,115	20,087	26,360	82	15,300	216,060
2021	216,060	19,808	27,519	79	15,917	224,187
2022	224,187	19,505	28,755	75	16,471	231,333
2023	231,333	19,184	30,058	70	16,947	237,336
2024	237,336	18,893	31,365	66	17,338	242,136
2025	242,136	18,608	32,582	62	17,643	245,743
2026	245,743	18,355	33,659	58	17,865	248,246
2027	248,246	18,132	34,689	54	18,007	249,642
2028	249,642	17,921	35,691	51	18,067	249,888
2029	249,888	17,680	36,643	47	18,042	248,920
2030	248,920	17,408	37,744	42	17,919	246,461
2031	246,461	17,168	38,657	38	17,692	242,626
2032	242,626	16,979	39,436	34	17,369	237,504
2033	237,504	16,799	40,094	31	16,954	231,132
2034	231,132	16,646	40,610	27	16,452	223,593
2035	223,593	16,542	40,914	24	15,871	215,068
2036	215,068	16,446	41,142	20	15,220	205,572
2037	205,572	16,356	41,295	17	14,499	195,115
2038	195,115	16,318	41,196	14	13,717	183,940
2039	183,940	16,336	40,900	12	12,891	172,255
2040	172,255	16,401	40,435	10	12,034	160,245
2041	160,245	16,481	39,845	8	11,158	148,031
2042	148,031	16,595	39,069	6	10,275	135,826
2043	135,826	16,750	38,116	5	9,400	123,855
2044	123,855	16,936	37,027	4	8,550	112,310
2045	112,310	17,145	35,834	3	7,735	101,353
2046	101,353	17,360	34,594	2	6,967	91,084
2047	91,084	17,625	33,202	1	6,258	81,764
2048	81,764	17,882	31,706	1	5,624	73,563
2049	73,563	18,147	30,202	-	5,074	66,582
2050	66,582	18,419	28,703	-	4,615	60,913
2051	60,913	18,716	27,166	-	4,258	56,721
2052	56,721	19,034	25,607	-	4,012	54,160
2053	54,160	19,360	24,072	-	3,889	53,337
2054	53,337	19,694	22,623	-	3,893	54,301
2055	54,301	20,036	21,252	-	4,028	57,113
2056	57,113	20,387	19,904	-	4,302	61,898
2057	61,898	14,747	18,580	-	4,502	62,567
2058	62,567	15,116	17,282	-	4,613	65,014
2059	65,014	15,493	16,012	-	4,857	69,352
2060	69,352	15,881	14,773	-	5,243	75,703
2061	75,703	16,278	13,569	-	5,778	84,190
2062	84,190	16,685	12,404	-	6,472	94,943
2063	94,943	17,102	11,279	-	7,335	108,101
2064	108,101	17,529	10,199	-	8,378	123,809
2065	123,809	17,968	9,166	-	9,610	142,221
2066	142,221	18,417	8,184	-	11,044	163,498
2067	163,498	18,877	7,258	-	12,690	187,807

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
(Concluded, 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)
2068	$ 187,807	$ 19,349	$ 6,389	$ -	$ 14,563	$ 215,330
2069	215,330	19,833	5,582	-	16,675	246,256
2070	246,256	20,329	4,837	-	19,040	280,788
2071	280,788	20,837	4,157	-	21,673	319,141
2072	319,141	21,358	3,542	-	24,592	361,549
2073	361,549	21,892	2,989	-	27,812	408,264
2074	408,264	22,439	2,498	-	31,354	459,559
2075	459,559	23,000	2,067	-	35,238	515,730
2076	515,730	23,575	1,691	-	39,486	577,100
2077	577,100	24,164	1,368	-	44,122	644,018
2078	644,018	24,769	1,093	-	49,173	716,867
2079	716,867	25,388	861	-	54,668	796,062
2080	796,062	26,023	668	-	60,638	882,055
2081	882,055	26,673	511	-	67,118	975,335
2082	975,335	27,340	384	-	74,143	1,076,434
2083	1,076,434	28,023	283	-	81,754	1,185,928
2084	1,185,928	28,724	205	-	89,995	1,304,442
2085	1,304,442	29,442	145	-	98,912	1,432,651
2086	1,432,651	30,178	100	-	108,556	1,571,285
2087	1,571,285	30,933	68	-	118,983	1,721,133
2088	1,721,133	31,706	44	-	130,251	1,883,046
2089	1,883,046	32,499	28	-	142,424	2,057,941
2090	2,057,941	33,311	17	-	155,572	2,246,807
2091	2,246,807	34,144	10	-	169,767	2,450,708
2092	2,450,708	34,997	6	-	185,092	2,670,791
2093	2,670,791	35,872	3	-	201,630	2,908,290
2094	2,908,290	36,769	2	-	219,476	3,164,533
2095	3,164,533	37,688	1	-	238,728	3,440,948
2096	3,440,948	38,631	-	-	259,494	3,739,073
2097	3,739,073	39,596	-	-	281,888	4,060,557
2098	4,060,557	40,586	-	-	306,036	4,407,179
2099	4,407,179	41,601	-	-	332,070	4,780,850
2100	4,780,850	42,641	-	-	360,134	5,183,625
2101	5,183,625	43,707	-	-	390,381	5,617,713
2102	5,617,713	44,800	-	-	422,978	6,085,491
2103	6,085,491	45,920	-	-	458,103	6,589,514
2104	6,589,514	47,068	-	-	495,947	7,132,529
2105	7,132,529	48,244	-	-	536,716	7,717,489
2106	7,717,489	49,450	-	-	580,632	8,347,571
2107	8,347,571	50,687	-	-	627,934	9,026,192
2108	9,026,192	51,954	-	-	678,877	9,757,023
2109	9,757,023	53,253	-	-	733,737	10,544,013
2110	10,544,013	54,584	-	-	792,811	11,391,408
2111	11,391,408	55,949	-	-	856,416	12,303,773
2112	12,303,773	57,347	-	-	924,894	13,286,014
2113	13,286,014	58,781	-	-	998,615	14,343,410
2114	14,343,410	60,250	-	-	1,077,974	15,481,634
2115	15,481,634	61,757	-	-	1,163,396	16,706,787
2116	16,706,787	63,301	-	-	1,255,340	18,025,428
2117	18,025,428	65,502	-	-	1,354,319	19,445,249

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)
2017	$ 185,141	$ 23,143	$ 23,143	$ -	$ 22,321	$ -	$ 22,321
2018	196,677	24,635	24,635	-	22,103	-	22,103
2019	207,115	26,360	26,360	-	22,000	-	22,000
2020	216,060	27,519	27,519	-	21,365	-	21,365
2021	224,187	28,755	28,755	-	20,767	-	20,767
2022	231,333	30,058	30,058	-	20,194	-	20,194
2023	237,336	31,365	31,365	-	19,601	-	19,601
2024	242,136	32,582	32,582	-	18,941	-	18,941
2025	245,743	33,659	33,659	-	18,202	-	18,202
2026	248,246	34,689	34,689	-	17,450	-	17,450
2027	249,642	35,691	35,691	-	16,702	-	16,702
2028	249,888	36,643	36,643	-	15,951	-	15,951
2029	248,920	37,744	37,744	-	15,284	-	15,284
2030	246,461	38,657	38,657	-	14,562	-	14,562
2031	242,626	39,436	39,436	-	13,819	-	13,819
2032	237,504	40,094	40,094	-	13,069	-	13,069
2033	231,132	40,610	40,610	-	12,314	-	12,314
2034	223,593	40,914	40,914	-	11,540	-	11,540
2035	215,068	41,142	41,142	-	10,795	-	10,795
2036	205,572	41,295	41,295	-	10,079	-	10,079
2037	195,115	41,196	41,196	-	9,354	-	9,354
2038	183,940	40,900	40,900	-	8,638	-	8,638
2039	172,255	40,435	40,435	-	7,944	-	7,944
2040	160,245	39,845	39,845	-	7,282	-	7,282
2041	148,031	39,069	39,069	-	6,642	-	6,642
2042	135,826	38,116	38,116	-	6,028	-	6,028
2043	123,855	37,027	37,027	-	5,447	-	5,447
2044	112,310	35,834	35,834	-	4,904	-	4,904
2045	101,353	34,594	34,594	-	4,404	-	4,404
2046	91,084	33,202	33,202	-	3,932	-	3,932
2047	81,764	31,706	31,706	-	3,493	-	3,493
2048	73,563	30,202	30,202	-	3,095	-	3,095
2049	66,582	28,703	28,703	-	2,736	-	2,736
2050	60,913	27,166	27,166	-	2,409	-	2,409
2051	56,721	25,607	25,607	-	2,112	-	2,112
2052	54,160	24,072	24,072	-	1,847	-	1,847
2053	53,337	22,623	22,623	-	1,615	-	1,615
2054	54,301	21,252	21,252	-	1,411	-	1,411
2055	57,113	19,904	19,904	-	1,229	-	1,229
2056	61,898	18,580	18,580	-	1,068	-	1,068
2057	62,567	17,282	17,282	-	924	-	924
2058	65,014	16,012	16,012	-	796	-	796
2059	69,352	14,773	14,773	-	683	-	683
2060	75,703	13,569	13,569	-	584	-	584
2061	84,190	12,404	12,404	-	496	-	496
2062	94,943	11,279	11,279	-	420	-	420
2063	108,101	10,199	10,199	-	353	-	353
2064	123,809	9,166	9,166	-	295	-	295
2065	142,221	8,184	8,184	-	245	-	245
2066	163,498	7,258	7,258	-	202	-	202

Single Discount Rate Development
Present Values of Projected Benefits
(Concluded, 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)
2067	$ 187,807	$ 6,389	$ 6,389	$ -	$ 22,321	$ -	$ 166
2068	215,330	5,582	5,582	-	22,103	-	135
2069	246,256	4,837	4,837	-	22,000	-	109
2070	280,788	4,157	4,157	-	21,365	-	87
2071	319,141	3,542	3,542	-	20,767	-	69
2072	361,549	2,989	2,989	-	20,194	-	54
2073	408,264	2,498	2,498	-	19,601	-	42
2074	459,559	2,067	2,067	-	18,941	-	32
2075	515,730	1,691	1,691	-	18,202	-	25
2076	577,100	1,368	1,368	-	17,450	-	19
2077	644,018	1,093	1,093	-	16,702	-	14
2078	716,867	861	861	-	15,951	-	10
2079	796,062	668	668	-	15,284	-	7
2080	882,055	511	511	-	14,562	-	5
2081	975,335	384	384	-	13,819	-	4
2082	1,076,434	283	283	-	13,069	-	2
2083	1,185,928	205	205	-	12,314	-	2
2084	1,304,442	145	145	-	11,540	-	1
2085	1,432,651	100	100	-	10,795	-	1
2086	1,571,285	68	68	-	10,079	-	0
2087	1,721,133	44	44	-	9,354	-	0
2088	1,883,046	28	28	-	8,638	-	0
2089	2,057,941	17	17	-	7,944	-	0
2090	2,246,807	10	10	-	7,282	-	0
2091	2,450,708	6	6	-	6,642	-	0
2092	2,670,791	3	3	-	6,028	-	0
2093	2,908,290	2	2	-	5,447	-	0
2094	3,164,533	1	1	-	4,904	-	0
2095	3,440,948	-	-	-	4,404	-	0
2096	3,739,073	-	-	-	3,932	-	0
2097	4,060,557	-	-	-	3,493	-	0
2098	4,407,179	-	-	-	3,095	-	0
2099	4,780,850	-	-	-	2,736	-	0
2100	5,183,625	-	-	-	2,409	-	-
2101	5,617,713	-	-	-	2,112	-	-
2102	6,085,491	-	-	-	1,847	-	-
2103	6,589,514	-	-	-	1,615	-	-
2104	7,132,529	-	-	-	1,411	-	-
2105	7,717,489	-	-	-	1,229	-	-
2106	8,347,571	-	-	-	1,068	-	-
2107	9,026,192	-	-	-	924	-	-
2108	9,757,023	-	-	-	796	-	-
2109	10,544,013	-	-	-	683	-	-
2110	11,391,408	-	-	-	584	-	-
2111	12,303,773	-	-	-	496	-	-
2112	13,286,014	-	-	-	420	-	-
2113	14,343,410	-	-	-	353	-	-
2114	15,481,634	-	-	-	295	-	-
2115	16,706,787	-	-	-	245	-	-
2116	18,025,428	-	-	-	202	-	-
				Totals	$ 428,437	$ -	$ 428,437

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

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.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
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 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 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 ages(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.