Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

JUDGES RETIREMENT FUND

GASB STATEMENTS NO. 67 AND NO. 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2016

GRS
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December 1, 2016

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 funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 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, 2016 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,

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

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

BBM/BJW:sc

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SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
AS OF JUNE 30, 2016 (DOLLARS IN THOUSANDS)

		2016
Actuarial Valuation Date		June 30, 2016
Measurement Date of the Net Pension Liability		June 30, 2016
Membership		
Number of		
- Service Retirements		250
- Survivors		80
- Disability Retirements		20
- Deferred Retirements		17
- Terminated other non-vested		0
- Active Members		311
- Total		678
Covered-Employee Payroll	$	45,418 [1]
Net Pension Liability		
Total Pension Liability	$	345,033
Plan Fiduciary Net Position		165,905
Net Pension Liability	$	179,128
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		48.08%
Net Pension Liability as a Percentage of Covered-Employee Payroll		394.40%
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]		2.85%
Last year ending June 30 in the 2017 to 2116 projection period for which projected benefit payments are fully funded		2116
Total Pension Expense/(Income)	$	5,720

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	$	7,740	$	2,620
Changes in assumptions		13,018		71,972
Net difference between projected and actual earnings on pension plan investments		14,489		6,419
Total	$	35,247	$	81,011

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

[2] *Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 30, 2016*

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, 2016.

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 41 years.
3. The funded status of the plan is expected to reach a 100% funded ratio in approximately 41 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, 2016 and a measurement date of June 30, 2016.

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 2.85% (based on the weekly rate closest to but not later than the measurement date of the Bond Buyer 20-Year GO Index); and the resulting single discount rate is 7.50%. The long-term expected rate of return is based on a review of inflation and investment assumptions, dated September 11, 2014, and a recent asset liability study obtained by the Minnesota State Board of Investment.

Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB. MSRS first implemented GASB Statement No. 67 for fiscal year 2014.

SECTION B

FINANCIAL STATEMENTS

PENSION EXPENSE UNDER GASB STATEMENT NO. 68
FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

A. Expense			
1.	Service Cost	$	13,711
2.	Interest on the Total Pension Liability		21,349
3.	Current-Period Benefit Changes		0
4.	Employee Contributions (made negative for addition here)		(3,763)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(13,456)
6.	Pension Plan Administrative Expense		93
7.	Other Changes in Plan Fiduciary Net Position		0
8.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Current Reporting Period		1,427
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		(17,151)
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Current Reporting Period		2,728
11.	**Increases/(Decreases) from Experience in the Current Reporting Period**	**$**	**4,938**
12.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Prior Reporting Periods		143
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		2,656
14.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Prior Reporting Periods		(2,017)
15.	**Total Pension Expense / (Income)**	**$**	**5,720**

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD FISCAL YEAR ENDED JUNE 30, 2016 (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	$	7,135
2. Assumption Changes (gains) or losses	$	(85,756)
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		5.0000
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	$	1,427
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	(17,151)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(15,724)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$	5,708
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	(68,605)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(62,897)
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	13,642
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	2,728
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	10,914

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS
FISCAL YEAR ENDED JUNE 30, 2016 (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	$ 6,782	$ 19,707	$ (12,925)
2. Due to Assets	3,920	3,209	711
3. Total	$ 10,702	$ 22,916	$ (12,214)

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	$ 873	$ 1,570
2. Assumption Changes	4,339	18,834	(14,495)
3. Net Difference between projected and actual earnings on pension plan investments	3,920	3,209	711
4. Total	$ 10,702	$ 22,916	$ (12,214)

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	$ 7,740	$ 2,620	$ 5,120
2. Assumption Changes	13,018	71,972	(58,954)
3. Net Difference between projected and actual earnings on pension plan investments	14,489	6,419	8,070
4. Total	$ 35,247	$ 81,011	$ (45,764)

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
2017	$ (12,214)
2018	(12,215)
2019	(8,339)
2020	(12,996)
2021	0
Thereafter	0
Total	$ (45,764)

Statement of Fiduciary Net Position as of June 30, 2016 (Dollars in Thousands)

Assets		June 30, 2016
Cash & Short-term Investments	$	5,048
Receivables		174
Investment Pools (at fair value)		160,823
Securities Lending Collateral		23,332
Capital Assets		0
Total Assets	**$**	**189,377**
Total Deferred Outflows of Resources	**$**	**0**
Total Liabilities	**$**	**(23,472)**
Total Deferred Inflows of Resources	**$**	**0**
Net Position Restricted for Pensions	**$**	**165,905**

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR THE FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

1. Net position at market value at beginning of year	**$**	**174,580**
Additions		
2. Contributions		
a. Employee	$	3,763
b. Employer		10,219
c. Other sources		0
d. Total contributions	$	13,982
3. Investment income		
a. Investment income/(loss)	$	36
b. Investment expenses		(222)
c. Net investment income/(loss)	$	(186)
4. Other Additions		0
5. Total Additions *(2.d.) + (3.c.) + (4.)*	**$**	**13,796**
Deductions		
6. Benefits Paid		
a. Annuity benefits	$	(22,378)
b. Refunds		0
c. Total benefits paid	$	(22,378)
7. Expenses		
a. Other deductions	$	0
b. Administrative		(93)
c. Total expenses	$	(93)
8. Total deductions *(6.c.) + (7.c.)*	**$**	**(22,471)**
9. Net increase/(decrease) in fiduciary net position *(5.) + (8.)*	**$**	**(8,675)**
10. Net position at market value at end of year *(1.) + (9.)*	**$**	**165,905**
11. State Board of Investment calculated annual investment return		-0.1%

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD
FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

A. Total pension liability			
1. Service Cost	$	13,711	
2. Interest on the Total Pension Liability		21,349	
3. Changes of benefit terms		0	
4. Difference between expected and actual experience of the Total Pension Liability		7,135	(1)
5. Changes of assumptions		(85,756)	(2)
6. Benefit payments, including refunds of employee contributions		(22,378)	
7. Net change in total pension liability	$	(65,939)	
8. Total pension liability – beginning		410,972	
9. Total pension liability – ending	**$**	**345,033**	
B. Plan fiduciary net position			
1. Contributions – employer	$	10,219	
2. Contributions – employee		3,763	
3. Net investment income		(186)	
4. Benefit payments, including refunds of employee contributions		(22,378)	
5. Pension Plan Administrative Expense		(93)	
6. Other changes		0	
7. Net change in plan fiduciary net position	$	(8,675)	
8. Plan fiduciary net position – beginning		174,580	
9. Plan fiduciary net position – ending	**$**	**165,905**	
C. Net pension liability, *A.9 - B.9.*	**$**	**179,128**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9 / A.9.*		**48.08%**	
E. Covered-employee payroll	**$**	**45,418**	(3)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**394.40%**	

(1) *Includes impact of changes in expected timing of future post-retirement benefit increases.*
(2) *Assumption changes are summarized on page 26.*
(3) *Assumed equal to actual employer contributions divided by employer contribution rate.*

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

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,	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Total Pension Liability										
Service Cost	$ 13,711	$ 12,251	$ 12,075							
Interest on the Total Pension Liability	21,349	21,773	20,535							
Benefit Changes	0	0	0							
Difference between Expected and Actual Experience	7,135 (1)	(4,366)	5,080							
Assumption Changes	(85,756) (2)	21,696	(8,416)							
Benefit Payments	(22,378)	(21,893)	(20,802)							
Refunds	0	0	0							
Net Change in Total Pension Liability	$ (65,939)	29,461	8,472							
Total Pension Liability - Beginning	410,972	381,511	373,039							
Total Pension Liability - Ending (a)	**$ 345,033**	**$ 410,972**	**$ 381,511**							
Plan Fiduciary Net Position										
Employer Contributions	$ 10,219	$ 9,776	$ 9,426							
Employee Contributions	3,763	3,629	3,578							
Pension Plan Net Investment Income	(186)	7,572	28,011							
Benefit Payments	(22,378)	(21,893)	(20,802)							
Refunds	0	0	0							
Pension Plan Administrative Expense	(93)	(60)	(55)							
Other Changes	0	0	0							
Net Change in Plan Fiduciary Net Position	**$ (8,675)**	**(976)**	**20,158**							
Plan Fiduciary Net Position - Beginning	**174,580**	**175,556**	**155,398**							
Plan Fiduciary Net Position - Ending (b)	**$ 165,905**	**$ 174,580**	**$ 175,556**							
Net Pension Liability - Ending (a) - (b)	**$ 179,128**	**236,392**	**205,955**							
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	**48.08 %**	**42.48 %**	**46.02 %**							
Covered-Employee Payroll[3]	**$ 45,418**	**$ 43,449**	**$ 41,893**							
Net Pension Liability as a Percentage of Covered-Employee Payroll	**394.40 %**	**544.07 %**	**491.62 %**							

Notes to Schedule:

(1) *Includes impact of changes in expected timing of future post-retirement benefit increases.*
(2) *Assumption changes are summarized on page 26.*
(3) *Assumed equal to actual employer contributions divided by employer contribution rate.*

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
SCHEDULE OF NET PENSION LIABILITY MULTIYEAR (DOLLARS IN THOUSANDS)

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)
2007						
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%

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)
2007	$ 8,331	$ 7,572	$ 759	$ 36,195	20.92%
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

NOTES TO SCHEDULE OF CONTRIBUTIONS

Valuation Date:	June 30, 2016
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.

Methods and Assumptions Used to Determine Contribution Rates Reported in this Schedule:

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 adjustment, 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]
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	18.66 %
2015	4.45
2016	(0.11)

[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, 2016, the annual money-weighted rate of return for the Judges Retirement Fund was (0.11) %. 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, 2016, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	45.00%	5.50%
International Stocks	15.00%	6.00%
Bonds	18.00%	1.45%
Alternative Assets	20.00%	6.50%
Unallocated Cash	2.00%	0.50%
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.

At MSRS' direction, 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 dated September 11, 2014, 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	$379,111	$345,033	$315,686
Net Position Restricted for Pensions	$165,905	$165,905	$165,905
Net Pension Liabitliy	**$213,206**	**$179,128**	**$149,781**

A single discount rate of 5.25% was used for the measurement date as of July 1, 2015. For more information on the calculation of the single discount rate, refer to Section G of this report.

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	**$ 410,972**	**$ 174,580**	**$ 236,392**	**$ 25,172**	**$ 18,171**	
Changes for the Year:						
Service Cost	$ 13,711		$ 13,711			$ 13,711
Interest on Total Pension Liability	21,349		21,349			21,349
Interest on Plan Fiduciary Net Position (1)		$ 13,456	(13,456)			(13,456)
Changes in Benefit Terms						
Liability Experience Gains and Losses	7,135		7,135	$ 5,708		1,427
Changes in Assumptions	(85,756)		(85,756)		$ 68,605	(17,151)
Recognition of Deferred Outflows/(Inflows) of Resources Arising from Prior Reporting Periods						
Liability Experience Gains/(Losses)				(1,016)	(873)	143
Assumption Changes				(4,339)	(1,683)	2,656
Investment Gains/(Losses)				(1,192)	(3,209)	(2,017)
Contributions - Employer		10,219	(10,219)			
Contributions - Employees		3,763	(3,763)			(3,763)
Asset Gain/(Loss) (1)		(13,642)	13,642	10,914		2,728
Benefit Payments and Refunds	(22,378)	(22,378)	0			
Administrative Expenses		(93)	93			93
Other Changes						
Net Changes	**$ (65,939)**	**$ (8,675)**	**$ (57,264)**	**$ 10,075**	**$ 62,840**	**$ 5,720**
Balance End of Year	**$ 345,033**	**$ 165,905**	**$ 179,128**	**$ 35,247**	**$ 81,011**	

(1) The sum of these items equals the net investment income of $(186).

SUMMARY OF POPULATION STATISTICS

		Terminated		Recipients			
	Actives*	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2015	**312**	**16**	**0**	**240**	**23**	**83**	**674**
New members	16	0	0	0	0	0	**16**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	0	0	0	0	0	0	**0**
Service retirements	(14)	(2)	0	16	0	0	**0**
Terminated deferred	(3)	3	0	0	0	0	**0**
Terminated refund/transfer	0	0	0	0	0	0	**0**
Deaths	0	0	0	(6)	(3)	(7)	**(16)**
New beneficiary	0	0	0	0	0	4	**4**
Disabled	0	0	0	0	0	0	**0**
Unexpected status changes	0	0	0	0	0	0	**0**
Net change	(1)	1	0	10	(3)	(3)	**4**
Members on 6/30/2016	**311**	**17**	**0**	**250**	**20**	**80**	**678**

* *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% 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 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 90% for two consecutive years (on a Market Value of Assets basis), the benefit increase will revert to 2.50%. A benefit recipient who has been receiving a benefit for at least 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of the June 30 of the calendar year immediately before the adjustment will receive a pro rata increase.

SUMMARY OF PLAN PROVISIONS (CONTINUED)

Disability	
Disability benefit	
Age/Service requirement	Permanent inability to perform the function of judge.
Amount	No benefit is paid by the Fund. Instead, salary is continued for one year but not beyond age 70. Employee contributions continue and Allowable Service is earned. If disability continues after the first year (or at age 70 if earlier), the larger of 25.00% of Average Salary or the Normal Retirement Benefit, without reduction.
Retirement after disability	
Age/Service requirement	Member is still disabled after salary payments cease after one year or at age 70, if earlier.
Amount	No change in disability benefit amount from pre-retirement computed benefit amount.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.
Death	
Survivor's benefit	
Age/service requirement	Active or disabled member dies before retirement or a former member eligible for a deferred annuity dies.
Amount	Larger of 25% of Average Salary or 60% of Normal Retirement Benefit earned at date of death. If member dies after age 60 with five or more years of service, spouse may receive the 100% joint and survivor benefit the member had earned as of date of death.
	Benefit paid to spouse for life. If no spouse, benefit is paid to surviving dependent children until child marries, dies, or attains age 18 (age 22 if full-time student).
Benefit increases	Same as for retirement.
Refund of contributions	
Age/service requirement	Member dies prior to retirement or former member eligible for a deferred annuity dies and survivors' benefits are not payable.
Amount	Member 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, 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 6.5% 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; (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Changes in plan provisions	2016 legislation provides state contributions equal to $3,000,000 for the fiscal year ending June 30, 2017, and $6,000,000 per year thereafter until the plan is fully funded.

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;

(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 2041, 2.00% per annum for the years 2042 through 2054, 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 demographic assumptions are based on the last experience study, dated February 2012, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014, 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 2041, 2.00% per annum for the years 2042 through 2054, 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-2000 employee generational mortality table projected using mortality improvement scale AA, white collar adjustment.
Healthy post-retirement	RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back one year for males and set back two years for females. The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50.
Disabled	RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back one year for males and set back two years for females.
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.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

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.
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.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement operation	Withdrawal decrements do not operate during retirement eligibility. Decrements are assumed to occur mid-fiscal year.
Service credit accruals	It is assumed that members accrue one year of service credit per year.
Pay Increases	Pay increases are assumed to happen at the beginning of the fiscal year. This is equivalent to assuming that reported earnings are pensionable earnings for the year ending on the valuation date.
Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members:</u> There were 11 members who have reached the 24-year service cap. Based on the salary reported under the Unclassified Employees Retirement Plan, we assumed these members earned $149,605 (9 members) or $159,370 (2 members) for the July 1, 2015 to June 30, 2016 plan year. There were no members reported with missing service. There were no members reported with missing or invalid birth dates. There were no members reported with an invalid gender. <u>Data for terminated members:</u> 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	<u>Data for members receiving benefits:</u> There were no members reported without a benefit. There were no members reported with missing or invalid birth dates. There was 1 member reported with a missing gender. We assumed male gender. There were retired members reported with a survivor option and an invalid or missing survivor gender (50 members) and/or survivor date of birth (38 members). We used the valuation assumptions if the survivor gender or date of birth was missing or invalid. There were 2 retirees reported with a bounce-back 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 was 1 retiree reported with a bounce back annuity but was not reported with a reasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively. There were 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% for all years to 1.75% per year through 2041, 2% per year from 2042 through 2054, and 2.5% per year thereafter. The assumed investment return was changed from 7.90% to 7.50%. The assumed future salary increases, payroll growth, and inflation were decreased by 0.25%. The single discount rate was changed from 5.25% to 7.50%.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

	Rate (%) *					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality**	
Age	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
20	0.03%	0.02%	0.03%	0.02%	0.03%	0.02%
25	0.04	0.02	0.04	0.02	0.04	0.02
30	0.04	0.02	0.04	0.03	0.04	0.02
35	0.05	0.04	0.06	0.05	0.05	0.04
40	0.08	0.06	0.09	0.06	0.08	0.06
45	0.12	0.08	0.13	0.10	0.12	0.08
50	0.18	0.13	0.20	0.16	0.18	0.13
55	0.56	0.29	0.27	0.24	0.56	0.29
60	0.61	0.47	0.43	0.38	0.61	0.47
65	1.04	0.74	0.67	0.59	1.04	0.74
70	1.74	1.24	0.98	0.88	1.74	1.24

** 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.*

*** These rates were adjusted for mortality improvements using projection scale AA.*

	Disability Retirement	
Age	**Male**	**Female**
20	0.00%	0.00%
25	0.00	0.00
30	0.00	0.00
35	0.01	0.00
40	0.01	0.01
45	0.02	0.03
50	0.07	0.05
55	0.17	0.12
60	0.38	0.31
65	0.00	0.00
70	0.00	0.00

Age	Retirement
60	0%
61	0
62	8
63	5
64	8
65	25
66	20
67	10
68	30
69	10
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 2.85% (based on the 20-Bond GO rate as of June 30, 2016). 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, 2016 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)
2016	$ 45,418		$ 45,418					
2017	47,953		47,953	$ 3,990	$ 10,790		$ 3,000	$ 17,780
2018	45,666	$ 3,486	49,152	3,779	10,275	$ 379	6,000	20,433
2019	42,836	7,545	50,381	3,526	9,638	825	6,000	19,989
2020	40,759	10,882	51,641	3,337	9,171	1,195	6,000	19,703
2021	38,918	14,014	52,932	3,169	8,757	1,546	6,000	19,472
2022	36,919	17,336	54,255	2,990	8,307	1,922	6,000	19,219
2023	34,693	20,918	55,611	2,795	7,806	2,330	6,000	18,931
2024	32,437	24,565	57,002	2,599	7,298	2,749	6,000	18,646
2025	30,178	28,249	58,427	2,405	6,790	3,175	6,000	18,370
2026	28,171	31,716	59,887	2,232	6,338	3,581	6,000	18,151
2027	26,354	35,030	61,384	2,077	5,930	3,974	6,000	17,981
2028	24,462	38,457	62,919	1,917	5,504	4,382	6,000	17,803
2029	22,412	42,080	64,492	1,746	5,043	4,816	6,000	17,605
2030	20,216	45,888	66,104	1,566	4,548	5,276	6,000	17,390
2031	18,074	49,683	67,757	1,392	4,067	5,738	6,000	17,197
2032	16,182	53,269	69,451	1,240	3,641	6,179	6,000	17,060
2033	14,367	56,820	71,187	1,094	3,233	6,620	6,000	16,947
2034	12,688	60,279	72,967	961	2,855	7,054	6,000	16,870
2035	11,175	63,616	74,791	841	2,514	7,477	6,000	16,832
2036	9,617	67,044	76,661	720	2,164	7,915	6,000	16,799
2037	8,040	70,537	78,577	598	1,809	8,363	6,000	16,770
2038	6,706	73,836	80,542	496	1,509	8,792	6,000	16,797
2039	5,566	76,989	82,555	409	1,252	9,207	6,000	16,868
2040	4,554	80,065	84,619	333	1,025	9,616	6,000	16,974
2041	3,538	83,197	86,735	257	796	10,035	6,000	17,088
2042	2,727	86,176	88,903	197	614	10,439	6,000	17,250
2043	2,140	88,985	91,125	154	481	10,825	6,000	17,460
2044	1,581	91,823	93,404	113	356	11,217	6,000	17,686
2045	1,100	94,639	95,739	78	248	11,610	6,000	17,936
2046	633	97,499	98,132	45	143	12,011	6,000	18,199
2047	366	100,219	100,585	26	82	12,397	6,000	18,505
2048	237	102,863	103,100	17	53	12,724	6,000	18,794
2049	128	105,550	105,678	9	29	13,056	6,000	19,094
2050	42	108,278	108,320	3	9	13,394	6,000	19,406
2051	0	111,028	111,028	0	0	13,734	6,000	19,734
2052	0	113,803	113,803	0	0	14,077	6,000	20,077
2053	0	116,648	116,648	0	0	14,429	6,000	20,429
2054	0	119,565	119,565	0	0	14,790	6,000	20,790
2055	0	122,554	122,554	0	0	15,160	6,000	21,160
2056	0	125,617	125,617	0	0	15,539	6,000	21,539
2057	0	128,758	128,758	0	0	15,927	6,000	21,927
2058	0	131,977	131,977	0	0	16,326	0	16,326
2059	0	135,276	135,276	0	0	16,734	0	16,734
2060	0	138,658	138,658	0	0	17,152	0	17,152
2061	0	142,125	142,125	0	0	17,581	0	17,581
2062	0	145,678	145,678	0	0	18,020	0	18,020
2063	0	149,320	149,320	0	0	18,471	0	18,471
2064	0	153,053	153,053	0	0	18,933	0	18,933
2065	0	156,879	156,879	0	0	19,406	0	19,406
2066	0	160,801	160,801	0	0	19,891	0	19,891

** Contributions related to future employees in excess of normal cost and expenses. Normal cost and expenses initially total 19.99% 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 (CONTINUED) (DOLLARS IN THOUSANDS)

	Projected Covered-Employee Payroll			Projected Contributions				
Fiscal Year Ending	Payroll for Current Employees	Payroll for New Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Contributions on Future Payroll toward Current UAL*		Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)		(g) = (d) + (e) + (f)
2067	$ 0	$ 164,821	$ 164,821	$ 0	$ 0	$ 20,388	$ 0	$ 20,388
2068	0	168,942	168,942	0	0	20,898	0	20,898
2069	0	173,165	173,165	0	0	21,421	0	21,421
2070	0	177,494	177,494	0	0	21,956	0	21,956
2071	0	181,932	181,932	0	0	22,505	0	22,505
2072	0	186,480	186,480	0	0	23,068	0	23,068
2073	0	191,142	191,142	0	0	23,644	0	23,644
2074	0	195,920	195,920	0	0	24,235	0	24,235
2075	0	200,818	200,818	0	0	24,841	0	24,841
2076	0	205,839	205,839	0	0	25,462	0	25,462
2077	0	210,985	210,985	0	0	26,099	0	26,099
2078	0	216,259	216,259	0	0	26,751	0	26,751
2079	0	221,666	221,666	0	0	27,420	0	27,420
2080	0	227,208	227,208	0	0	28,106	0	28,106
2081	0	232,888	232,888	0	0	28,808	0	28,808
2082	0	238,710	238,710	0	0	29,528	0	29,528
2083	0	244,678	244,678	0	0	30,267	0	30,267
2084	0	250,795	250,795	0	0	31,023	0	31,023
2085	0	257,065	257,065	0	0	31,799	0	31,799
2086	0	263,491	263,491	0	0	32,594	0	32,594
2087	0	270,078	270,078	0	0	33,409	0	33,409
2088	0	276,830	276,830	0	0	34,244	0	34,244
2089	0	283,751	283,751	0	0	35,100	0	35,100
2090	0	290,845	290,845	0	0	35,978	0	35,978
2091	0	298,116	298,116	0	0	36,877	0	36,877
2092	0	305,569	305,569	0	0	37,799	0	37,799
2093	0	313,208	313,208	0	0	38,744	0	38,744
2094	0	321,038	321,038	0	0	39,712	0	39,712
2095	0	329,064	329,064	0	0	40,705	0	40,705
2096	0	337,291	337,291	0	0	41,723	0	41,723
2097	0	345,723	345,723	0	0	42,766	0	42,766
2098	0	354,366	354,366	0	0	43,835	0	43,835
2099	0	363,225	363,225	0	0	44,931	0	44,931
2100	0	372,306	372,306	0	0	46,054	0	46,054
2101	0	381,614	381,614	0	0	47,206	0	47,206
2102	0	391,154	391,154	0	0	48,386	0	48,386
2103	0	400,933	400,933	0	0	49,595	0	49,595
2104	0	410,956	410,956	0	0	50,835	0	50,835
2105	0	421,230	421,230	0	0	52,106	0	52,106
2106	0	431,761	431,761	0	0	53,409	0	53,409
2107	0	442,555	442,555	0	0	54,744	0	54,744
2108	0	453,619	453,619	0	0	56,113	0	56,113
2109	0	464,959	464,959	0	0	57,515	0	57,515
2110	0	476,583	476,583	0	0	58,953	0	58,953
2111	0	488,498	488,498	0	0	60,427	0	60,427
2112	0	500,710	500,710	0	0	61,938	0	61,938
2113	0	513,228	513,228	0	0	63,486	0	63,486
2114	0	526,059	526,059	0	0	65,073	0	65,073
2115	0	539,210	539,210	0	0	66,700	0	66,700
2116	0	552,690	552,690	0	0	68,976	0	68,976

** Contributions related to future employees in excess of normal cost and expenses. Normal cost and expenses initially total 19.99% 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)
2017	$ 165,905	$ 17,780	$ 22,931	$ 101	$ 12,249	$ 172,902
2018	172,902	20,433	24,136	96	12,828	181,931
2019	181,931	19,989	25,588	90	13,435	189,677
2020	189,677	19,703	26,864	86	13,959	196,389
2021	196,389	19,472	27,874	82	14,417	202,322
2022	202,322	19,219	28,939	78	14,814	207,338
2023	207,338	18,931	30,110	73	15,136	211,222
2024	211,222	18,646	31,360	68	15,371	213,811
2025	213,811	18,370	32,513	63	15,513	215,118
2026	215,118	18,151	33,467	59	15,568	215,311
2027	215,311	17,981	34,329	55	15,545	214,453
2028	214,453	17,803	35,203	51	15,441	212,443
2029	212,443	17,605	36,010	47	15,254	209,245
2030	209,245	17,390	36,929	42	14,972	204,636
2031	204,636	17,197	37,693	38	14,592	198,694
2032	198,694	17,060	38,289	34	14,119	191,550
2033	191,550	16,947	38,701	30	13,564	183,330
2034	183,330	16,870	38,930	27	12,937	174,180
2035	174,180	16,832	38,970	23	12,248	164,267
2036	164,267	16,799	38,937	20	11,504	153,613
2037	153,613	16,770	38,818	17	10,709	142,257
2038	142,257	16,797	38,439	14	9,872	130,473
2039	130,473	16,868	37,849	12	9,013	118,493
2040	118,493	16,974	37,087	10	8,146	106,516
2041	106,516	17,088	36,235	7	7,284	94,646
2042	94,646	17,250	35,223	6	6,436	83,103
2043	83,103	17,460	34,072	4	5,621	72,108
2044	72,108	17,686	32,858	3	4,849	61,782
2045	61,782	17,936	31,563	2	4,132	52,285
2046	52,285	18,199	30,237	1	3,478	43,724
2047	43,724	18,505	28,790	1	2,900	36,338
2048	36,338	18,794	27,273	0	2,413	30,272
2049	30,272	19,094	25,760	0	2,025	25,631
2050	25,631	19,406	24,259	0	1,743	22,521
2051	22,521	19,734	22,521	0	1,577	21,311
2052	21,311	20,077	21,311	0	1,536	21,613
2053	21,613	20,429	19,816	0	1,628	23,854
2054	23,854	20,790	18,395	0	1,862	28,111
2055	28,111	21,160	17,053	0	2,244	34,462
2056	34,462	21,539	15,785	0	2,781	42,997
2057	42,997	21,927	14,549	0	3,481	53,856
2058	53,856	16,326	13,349	0	4,134	60,967
2059	60,967	16,734	12,187	0	4,725	70,239
2060	70,239	17,152	11,067	0	5,477	81,801
2061	81,801	17,581	9,994	0	6,399	95,787
2062	95,787	18,020	8,970	0	7,502	112,339
2063	112,339	18,471	7,999	0	8,796	131,607
2064	131,607	18,933	7,081	0	10,292	153,751
2065	153,751	19,406	6,219	0	12,002	178,940
2066	178,940	19,891	5,416	0	13,938	207,353

Single Discount Rate Development
Projection of Plan Fiduciary Net Position (Continued)
(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)
2067	$ 207,353	$ 20,388	$ 4,678	$ 0	$ 16,115	$ 239,178
2068	239,178	20,898	4,005	0	18,545	274,616
2069	274,616	21,421	3,397	0	21,245	313,885
2070	313,885	21,956	2,854	0	24,230	357,217
2071	357,217	22,505	2,376	0	27,518	404,864
2072	404,864	23,068	1,960	0	31,127	457,099
2073	457,099	23,644	1,600	0	35,079	514,222
2074	514,222	24,235	1,292	0	39,397	576,562
2075	576,562	24,841	1,033	0	44,104	644,474
2076	644,474	25,462	817	0	49,228	718,347
2077	718,347	26,099	640	0	54,798	798,604
2078	798,604	26,751	495	0	60,847	885,707
2079	885,707	27,420	379	0	67,409	980,157
2080	980,157	28,106	288	0	74,521	1,082,496
2081	1,082,496	28,808	216	0	82,225	1,193,313
2082	1,193,313	29,528	161	0	90,565	1,313,245
2083	1,313,245	30,267	118	0	99,589	1,442,983
2084	1,442,983	31,023	86	0	109,348	1,583,268
2085	1,583,268	31,799	62	0	119,899	1,734,904
2086	1,734,904	32,594	44	0	131,301	1,898,755
2087	1,898,755	33,409	30	0	143,621	2,075,755
2088	2,075,755	34,244	21	0	156,927	2,266,905
2089	2,266,905	35,100	14	0	171,295	2,473,286
2090	2,473,286	35,978	9	0	186,806	2,696,061
2091	2,696,061	36,877	6	0	203,547	2,936,479
2092	2,936,479	37,799	4	0	221,612	3,195,886
2093	3,195,886	38,744	2	0	241,103	3,475,731
2094	3,475,731	39,712	1	0	262,127	3,777,569
2095	3,777,569	40,705	1	0	284,801	4,103,074
2096	4,103,074	41,723	0	0	309,252	4,454,049
2097	4,454,049	42,766	0	0	335,613	4,832,428
2098	4,832,428	43,835	0	0	364,031	5,240,294
2099	5,240,294	44,931	0	0	394,661	5,679,886
2100	5,679,886	46,054	0	0	427,672	6,153,612
2101	6,153,612	47,206	0	0	463,244	6,664,062
2102	6,664,062	48,386	0	0	501,571	7,214,019
2103	7,214,019	49,595	0	0	542,862	7,806,476
2104	7,806,476	50,835	0	0	587,342	8,444,653
2105	8,444,653	52,106	0	0	635,252	9,132,011
2106	9,132,011	53,409	0	0	686,852	9,872,272
2107	9,872,272	54,744	0	0	742,421	10,669,437
2108	10,669,437	56,113	0	0	802,259	11,527,809
2109	11,527,809	57,515	0	0	866,688	12,452,012
2110	12,452,012	58,953	0	0	936,056	13,447,021
2111	13,447,021	60,427	0	0	1,010,736	14,518,184
2112	14,518,184	61,938	0	0	1,091,129	15,671,251
2113	15,671,251	63,486	0	0	1,177,666	16,912,403
2114	16,912,403	65,073	0	0	1,270,811	18,248,287
2115	18,248,287	66,700	0	0	1,371,062	19,686,049
2116	19,686,049	68,976	0	0	1,478,978	21,234,003

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	$ 165,905	$ 22,931	$ 22,931	$ 0	$ 22,117	$ 0	$ 22,117
2018	172,902	24,136	24,136	0	21,654	0	21,654
2019	181,931	25,588	25,588	0	21,355	0	21,355
2020	189,677	26,864	26,864	0	20,857	0	20,857
2021	196,389	27,874	27,874	0	20,131	0	20,131
2022	202,322	28,939	28,939	0	19,442	0	19,442
2023	207,338	30,110	30,110	0	18,817	0	18,817
2024	211,222	31,360	31,360	0	18,231	0	18,231
2025	213,811	32,513	32,513	0	17,583	0	17,583
2026	215,118	33,467	33,467	0	16,836	0	16,836
2027	215,311	34,329	34,329	0	16,065	0	16,065
2028	214,453	35,203	35,203	0	15,325	0	15,325
2029	212,443	36,010	36,010	0	14,582	0	14,582
2030	209,245	36,929	36,929	0	13,911	0	13,911
2031	204,636	37,693	37,693	0	13,208	0	13,208
2032	198,694	38,289	38,289	0	12,481	0	12,481
2033	191,550	38,701	38,701	0	11,735	0	11,735
2034	183,330	38,930	38,930	0	10,981	0	10,981
2035	174,180	38,970	38,970	0	10,225	0	10,225
2036	164,267	38,937	38,937	0	9,504	0	9,504
2037	153,613	38,818	38,818	0	8,814	0	8,814
2038	142,257	38,439	38,439	0	8,119	0	8,119
2039	130,473	37,849	37,849	0	7,436	0	7,436
2040	118,493	37,087	37,087	0	6,778	0	6,778
2041	106,516	36,235	36,235	0	6,161	0	6,161
2042	94,646	35,223	35,223	0	5,571	0	5,571
2043	83,103	34,072	34,072	0	5,013	0	5,013
2044	72,108	32,858	32,858	0	4,497	0	4,497
2045	61,782	31,563	31,563	0	4,018	0	4,018
2046	52,285	30,237	30,237	0	3,581	0	3,581
2047	43,724	28,790	28,790	0	3,172	0	3,172
2048	36,338	27,273	27,273	0	2,795	0	2,795
2049	30,272	25,760	25,760	0	2,456	0	2,456
2050	25,631	24,259	24,259	0	2,151	0	2,151
2051	22,521	22,521	22,521	0	1,858	0	1,858
2052	21,311	21,311	21,311	0	1,617	0	1,617
2053	21,613	19,816	19,816	0	1,415	0	1,415
2054	23,854	18,395	18,395	0	1,221	0	1,221
2055	28,111	17,053	17,053	0	1,053	0	1,053
2056	34,462	15,785	15,785	0	907	0	907
2057	42,997	14,549	14,549	0	778	0	778
2058	53,856	13,349	13,349	0	664	0	664
2059	60,967	12,187	12,187	0	564	0	564
2060	70,239	11,067	11,067	0	476	0	476
2061	81,801	9,994	9,994	0	400	0	400
2062	95,787	8,970	8,970	0	334	0	334
2063	112,339	7,999	7,999	0	277	0	277
2064	131,607	7,081	7,081	0	228	0	228
2065	153,751	6,219	6,219	0	186	0	186
2066	178,940	5,416	5,416	0	151	0	151

Single Discount Rate Development
Present Values of Projected Benefits (Continued)
(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	$ 207,353	$ 4,678	$ 4,678	$ 0	$ 22,117	$ 0	$ 121
2068	239,178	4,005	4,005	0	21,654	0	97
2069	274,616	3,397	3,397	0	21,355	0	76
2070	313,885	2,854	2,854	0	20,857	0	60
2071	357,217	2,376	2,376	0	20,131	0	46
2072	404,864	1,960	1,960	0	19,442	0	35
2073	457,099	1,600	1,600	0	18,817	0	27
2074	514,222	1,292	1,292	0	18,231	0	20
2075	576,562	1,033	1,033	0	17,583	0	15
2076	644,474	817	817	0	16,836	0	11
2077	718,347	640	640	0	16,065	0	8
2078	798,604	495	495	0	15,325	0	6
2079	885,707	379	379	0	14,582	0	4
2080	980,157	288	288	0	13,911	0	3
2081	1,082,496	216	216	0	13,208	0	2
2082	1,193,313	161	161	0	12,481	0	1
2083	1,313,245	118	118	0	11,735	0	1
2084	1,442,983	86	86	0	10,981	0	1
2085	1,583,268	62	62	0	10,225	0	0
2086	1,734,904	44	44	0	9,504	0	0
2087	1,898,755	30	30	0	8,814	0	0
2088	2,075,755	21	21	0	8,119	0	0
2089	2,266,905	14	14	0	7,436	0	0
2090	2,473,286	9	9	0	6,778	0	0
2091	2,696,061	6	6	0	6,161	0	0
2092	2,936,479	4	4	0	5,571	0	0
2093	3,195,886	2	2	0	5,013	0	0
2094	3,475,731	1	1	0	4,497	0	0
2095	3,777,569	1	1	0	4,018	0	0
2096	4,103,074	0	0	0	3,581	0	0
2097	4,454,049	0	0	0	3,172	0	0
2098	4,832,428	0	0	0	2,795	0	0
2099	5,240,294	0	0	0	2,456	0	0
2100	5,679,886	0	0	0	2,151	0	0
2101	6,153,612	0	0	0	1,858	0	0
2102	6,664,062	0	0	0	1,617	0	0
2103	7,214,019	0	0	0	1,415	0	0
2104	7,806,476	0	0	0	1,221	0	0
2105	8,444,653	0	0	0	1,053	0	0
2106	9,132,011	0	0	0	907	0	0
2107	9,872,272	0	0	0	778	0	0
2108	10,669,437	0	0	0	664	0	0
2109	11,527,809	0	0	0	564	0	0
2110	12,452,012	0	0	0	476	0	0
2111	13,447,021	0	0	0	400	0	0
2112	14,518,184	0	0	0	334	0	0
2113	15,671,251	0	0	0	277	0	0
2114	16,912,403	0	0	0	228	0	0
2115	18,248,287	0	0	0	186	0	0
2116	19,686,049	0	0	0	151	0	0
				Totals	$ 408,263	$ -	$ 408,263

SECTION H

GLOSSARY OF TERMS

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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.

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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.

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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.

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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.