Public Employees Retirement Association of Minnesota

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

GRS Retirement Consulting
P: 800.521.0498 | F: 763.432.5842 | www.grsconsulting.com

November 10, 2017

Public Employees Retirement Association of Minnesota
General Employees Retirement Plan
St. Paul, Minnesota

Dear Trustees of the General Employees Retirement Plan:

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 General Employees Retirement Plan ("GERP"), 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 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. PERA is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer. This report may be provided to parties other than the Public Employees Retirement Association (PERA) only in its entirety and only with the permission of PERA. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by PERA, 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 data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the General Employees Retirement Plan 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

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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
Employer's Fiscal Year Ending Date (Reporting Date)	Varies by Employer
Membership	
Number of	
- Service Retirements	85,777
- Survivors	8,645
- Disability Retirements	3,779
- Deferred Retirements	52,274
- Terminated other non-vested	138,335
- Active Members	152,867
- Total	441,677
Covered Payroll	$ 6,156,985
Net Pension Liability	
Total Pension Liability	$ 26,484,513
Plan Fiduciary Net Position	$ 20,100,579
Net Pension Liability	$ 6,383,934
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	75.90%
Net Pension Liability as a Percentage of Covered Payroll	103.69%
Development of the Single Discount Rate	
Single Discount Rate	7.50%
Long-Term Expected Rate of Investment Return	7.50%
Long-Term Municipal Bond Rate*	3.56%
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)	$ 826,929

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

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	$ 210,395	$ 410,694
Changes in assumptions	$ 1,059,869	$ 639,990
Net difference between projected and actual earnings on pension plan investments	$ 1,125,175	$ 1,401,258
Total	$ 2,395,439	$ 2,451,942

* *Source:* *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. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*

Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 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 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. Governmental Accounting Standards Board (GASB) Statement No. 82, Pension Issues, is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

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

Financial Statements

GASB Statement No. 68 requires state or local governments 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 GERP 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 liability and investment experience.

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

Notes to Financial Statements

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

Both GASB Statement No. 67 and No. 68 require the notes of the financial statements for the employers and pension plans, to include certain additional information. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the type 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 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.

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.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to 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.

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 market value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain approximately level as a percentage of payroll.
2. The funded status of the plan is expected to increase gradually toward a 100% funded ratio.

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.

Single Discount Rate

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 3.56% (based on the weekly rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); 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	$	471,706
2. Interest on the Total Pension Liability	$	1,921,869
3. Current-Period Benefit Changes	$	-
4. Employee Contributions (made negative for addition here)	$	(400,204)
5. Projected Earnings on Plan Investments (made negative for addition here)	$	(1,327,972)
6. Pension Plan Administrative Expense	$	11,292
7. Other Changes in Plan Fiduciary Net Position	$	(651)
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	$	70,132
9. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Current Reporting Period	$	(213,330)
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	$	(270,986)
11. **Increase/(Decrease) from Experience in Current Reporting Period**	**$**	**261,856**
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	$	(224,865)
13. Recognition of Outflow (Inflow) of Resources due to assumption changes		
Arising from Prior Reporting Periods	$	691,311
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	$	98,627
15. Total Pension Expense / (Income)	**$**	**826,929**

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	$	280,527
2. Assumption Changes (gains) or losses	$	(853,320)
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		4.0000
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	$	70,132
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	(213,330)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(143,198)
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	$	210,395
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	(639,990)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(429,595)
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(1,354,929)
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	$	(270,986)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(1,083,943)

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 of Resources
1. Due to Liabilities	$ 785,473	$ 462,225	$ 323,248
2. Due to Assets	$ 415,942	$ 588,301	$ (172,359)
3. Total	$ 1,201,415	$ 1,050,526	$ 150,889

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ 94,162	$ 248,895	$ (154,733)
2. Assumption Changes	$ 691,311	$ 213,330	$ 477,981
3. Net Difference between projected and actual earnings on pension plan investments	$ 415,942	$ 588,301	$ (172,359)
4. Total	$ 1,201,415	$ 1,050,526	$ 150,889

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 of Resources
1. Differences between expected and actual experience	$ 210,395	$ 410,694	$ (200,299)
2. Assumption Changes	$ 1,059,869	$ 639,990	$ 419,879
3. Net Difference between projected and actual earnings on pension plan investments	$ 1,125,175	$ 1,401,258	$ (276,083)
4. Total	$ 2,395,439	$ 2,451,942	$ (56,503)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2018	$ (34,517)
2019	$ 369,896
2020	$ (120,897)
2021	$ (270,985)
2022	$ -
Thereafter	$ -
Total	$ (56,503)

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

	Market Value				
Assets in Trust	**June 30, 2017**			**June 30, 2016**	
Cash, equivalents, short term securities	$	491,850	$	371,576	
Fixed income	$	3,895,018	$	4,437,241	
Equity	$	13,042,724	$	10,849,195	
SBI Alternative	$	2,635,922	$	2,300,707	
Other	$	6,906	$	7,014	
Total Assets in Trust	**$**	**20,072,420**	**$**	**17,965,733**	
Assets Receivable	$	40,865 *	$	41,539	**
Amounts Payable	$	(12,706)	$	(12,363)	
Net Position Restricted for Pensions	**$**	**20,100,579**	**$**	**17,994,909**	

* *Includes $31 million Employer Supplemental Contribution to be paid in July and December 2017.*

** *Includes $31 million Employer Supplemental Contribution paid in July and December 2016.*

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

Change in Assets		**Market Value**	
Year Ending		**June 30, 2017**	**June 30, 2016**
1.	Fund balance at market value at beginning of year	$ 17,994,909	$ 18,581,795
2.	Adjustment to match restated PERA fund balance	$ 240	$ -
3.	Fund balance at market value at beginning of year, as restated	$ 17,995,149	$ 18,581,795
4.	Contributions		
	a. Member	$ 400,204	$ 375,291
	b. Employer	$ 477,888 *	$ 459,978 **
	c. Other sources	$ 6,000	$ 6,000
	d. Total contributions	$ 884,092	$ 841,269
5.	Investment income		
	a. Investment income/(loss)	$ 2,703,723	$ 3,160
	b. Investment expenses	$ (20,822)	$ (24,011)
	c. Net subtotal	$ 2,682,901	$ (20,851)
6.	Other	$ 411	$ 431
7.	**Total additions:** *(4.d.) + (5.c.) + (6.)*	**$ 3,567,404**	**$ 820,849**
8.	Benefits Paid		
	a. Annuity benefits	$ (1,413,448)	$ (1,359,176)
	b. Refunds	$ (37,234)	$ (37,209)
	c. Total benefits paid	$ (1,450,682)	$ (1,396,385)
9.	Expenses		
	a. Other	$ -	$ -
	b. Administrative	$ (11,292)	$ (11,350)
	c. Total expenses	$ (11,292)	$ (11,350)
10.	**Total deductions:** *(8.c.) + (9.c.)*	**$ (1,461,974)**	**$ (1,407,735)**
11.	Net increase (decrease) in net position: *(7) + (10)*	$ 2,105,430	$ (586,886)
12.	**Transfer between funds**	**$ -**	$ -
13.	**Net position restricted for pensions**	**$ 20,100,579**	**$ 17,994,909**
14.	Approximate return on market value of assets	15.1%	-0.2%

* *Includes $31 million Employer Supplemental Contribution to be paid in July and December 2017.*

** *Includes $31 million Employer Supplemental Contribution paid in July and December 2016.*

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	$	471,706
2. Interest on the Total Pension Liability	$	1,921,869
3. Changes of benefit terms	$	-
4. Difference between expected and actual experience of the Total Pension Liability*	$	280,527
5. Changes of assumptions	$	(853,320)
6. Benefit payments, including refunds of employee contributions	$	(1,450,682)
7. Net change in total pension liability	$	370,100
8. Total pension liability – beginning July 1, 2016	$	26,114,413
9. Total pension liability – ending June 30, 2017	**$**	**26,484,513**
B. Plan fiduciary net position		
1. Contributions – employer	$	483,888
2. Contributions – employee	$	400,204
3. Net investment income	$	2,682,901
4. Benefit payments, including refunds of employee contributions	$	(1,450,682)
5. Pension Plan Administrative Expense	$	(11,292)
6. Other**	$	651
7. Net change in plan fiduciary net position	$	2,105,670
8. Plan fiduciary net position – beginning July 1, 2016	$	17,994,909
9. Plan fiduciary net position – ending June 30, 2017	**$**	**20,100,579**
C. Net pension liability	**$**	**6,383,934**
D. Plan fiduciary net position as a percentage of the total pension liability		**75.90%**
E. Covered-employee payroll^	**$**	**6,156,985**
F. Net pension liability as a percentage of covered-employee payroll		**103.69%**

* *Includes impact of changes in expected timing of future COLA increases.*

** *Includes $411 of other income and $240 due to PERA's restatement of the June 30, 2016 end of year plan fiduciary net position.*

^ *Assumed equal to actual member contributions divided by employee 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 may be built prospectively)

Fiscal year ending June 30,	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total Pension Liability										
Service Cost	$ 471,706	$ 434,551	$ 421,602	$ 388,391						
Interest on the Total Pension Liability	$ 1,921,869	$ 1,839,388	$ 1,712,534	$ 1,591,756						
Benefit Changes	$ -	$ -	$ 1,147,198	$ -						
Experience	$ 280,527	$ (647,197)	$ (348,383)	$ 96,123						
Assumption Changes	$ (853,320)	$ 2,119,742	$ -	$ 645,499						
Benefit Payments	$ (1,413,448)	$ (1,359,176)	$ (1,235,303)	$ (1,109,866)						
Refunds	$ (37,234)	$ (37,209)	$ (35,655)	$ (38,264)						
Net Change in Total Pension Liability	$ 370,100	$ 2,350,099	$ 1,661,993	$ 1,573,639						
Total Pension Liability - Beginning	$ 26,114,413	$ 23,764,314	$ 22,102,321	$ 20,528,682						
Total Pension Liability - Ending (a)	$ 26,484,513	$ 26,114,413	$ 23,764,314	$ 22,102,321						
Plan Fiduciary Net Position										
Employer Contributions	$ 483,888	$ 465,978	$ 435,115	$ 382,251						
Employee Contributions	$ 400,204	$ 375,291	$ 353,765	$ 334,495						
Pension Plan Net Investment Income	$ 2,682,901	$ (20,851)	$ 777,504	$ 2,760,854						
Benefit Payments	$ (1,413,448)	$ (1,359,176)	$ (1,235,303)	$ (1,109,866)						
Refunds	$ (37,234)	$ (37,209)	$ (35,655)	$ (38,264)						
Pension Plan Administrative Expense	$ (11,292)	$ (11,350)	$ (10,367)	$ (9,861)						
Other*	$ 651	$ 431	$ 891,914	$ 605						
Net Change in Plan Fiduciary Net Position	$ 2,105,670	$ (586,886)	$ 1,176,973	$ 2,320,214						
Plan Fiduciary Net Position - Beginning	$ 17,994,909	$ 18,581,795	$ 17,404,822	$ 15,084,608						
Plan Fiduciary Net Position - Ending (b)	$ 20,100,579	$ 17,994,909	$ 18,581,795	$ 17,404,822						
Net Pension Liability - Ending (a) - (b)	$ 6,383,934	$ 8,119,504	$ 5,182,519	$ 4,697,499						
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	75.90 %	68.91 %	78.19 %	78.75 %						
Covered-employee payroll	$ 6,156,985	$ 5,773,708	$ 5,549,255	$ 5,351,920						
Net Pension Liability as a Percentage of covered-employee payroll	103.69 %	140.63 %	93.39 %	87.77 %						

Notes to Schedule:

N/A

** Includes $411 of other income and $240 due to PERA's restatement of the June 30, 2016 end of year plan fiduciary net position.*

Schedules of Required Supplementary Information
Schedule of the Net Pension Liability Multiyear
(Dollars in Thousands)

Last 10 Fiscal Years (which may be built prospectively)

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2008			$ -			
2009			$ -			
2010			$ -			
2011			$ -			
2012			$ -			
2013			$ -			
2014	$ 22,102,321	$ 17,404,822	$ 4,697,499	78.75%	$ 5,351,920	87.77%
2015	$ 23,764,314	$ 18,581,795	$ 5,182,519	78.19%	$ 5,549,255	93.39%
2016	$ 26,114,413	$ 17,994,909	$ 8,119,504	68.91%	$ 5,773,708	140.63%
2017	$ 26,484,513	$ 20,100,579	$ 6,383,934	75.90%	$ 6,156,985	103.69%

Schedule of Contributions Multiyear (Dollars in Thousands)

Last 10 Fiscal Years

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2008	$ 374,522	$ 303,304	$ 71,218	$ 4,722,432	6.42%
2009	$ 381,151	$ 328,603	$ 52,548	$ 4,778,708	6.88
2010	$ 443,548	$ 342,678	$ 100,870	$ 4,804,627	7.13
2011	$ 321,782	$ 357,596	$ (35,814)	$ 5,079,429	7.04
2012	$ 371,295	$ 368,037	$ 3,258	$ 5,142,592	7.16
2013	$ 430,773	$ 372,652	$ 58,121	$ 5,246,928	7.10
2014	$ 476,321	$ 382,251	$ 94,070	$ 5,351,920	7.14
2015	$ 523,017	$ 435,115	$ 87,902	$ 5,549,255	7.84
2016	$ 542,151	$ 465,978	$ 76,173	$ 5,773,708	8.07
2017	$ 615,083	$ 483,888	$ 131,195	$ 6,156,985	7.86

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Contribution Rates for the Fiscal Year ending June 30, 2017:

Valuation Date:	June 30, 2016
Notes	Actuarially determined contribution rates are calculated as of each June 30 and apply to the fiscal year beginning on the day after the measurement
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	17 years
Asset Valuation Method	5-year smoothed market; no corridor
Inflation	2.75%
Payroll Growth	3.50%
Salary Increases	3.50% to 11.50% including inflation
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 2016 valuation pursuant to an experience study of the period 2008 - 2015.
Mortality	RP-2014 annuitant generational mortality table, projected with scale MP-2015 from a base year of 2014, white collar adjustment, set forward two years for males and rates adjusted by a factor of 0.90 for females.

Other Information:

Notes	The plan is assumed to pay a 2.5% post retirement benefit increase beginning January 1, 2053. See separate funding report as of July 1, 2016 for additional detail.

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

FY Ending June 30,	Annual Return[1]
2008	
2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	

[1] *Annual money-weighted rate of return, net of investment expenses.*

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

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 a geometric, long-term expected rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each major asset class that is included in the pension fund's target asset allocation as of June 30, 2017, these best estimates are summarized in the following table:

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 PERA for GASB compliance purposes. PERA 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.

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 plan member, employer, and state contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 7.50%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

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	$ 30,002,535	$ 26,484,513	$ 23,604,374
Net Position Restricted for Pensions	$ 20,100,579	$ 20,100,579	$ 20,100,579
Net Pension Liability	**$ 9,901,956**	**$ 6,383,934**	**$ 3,503,794**

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)
Current Reporting Period

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Current Period: Deferred Outflows	Current Period: Deferred Inflows	Current Period: Pension Expense*
Balance Beginning of Year	**$ 26,114,413**	**$ 17,994,909**	**$ 8,119,504**			
Changes for the Year:						
Service Cost	$ 471,706		$ 471,706			$ 471,706
Interest on Total Pension Liability	$ 1,921,869		$ 1,921,869			$ 1,921,869
Interest on Fiduciary Net Position		$ 1,327,972	$ (1,327,972)			$ (1,327,972)
Changes in Benefit Terms	$ -		$ -			$ -
Liability Experience Gains and Losses	$ 280,527		$ 280,527	$ 210,395		$ 70,132
Changes in Assumptions	$ (853,320)		$ (853,320)		$ 639,990	$ (213,330)
Contributions - Employer		$ 483,888	$ (483,888)			
Contributions - Employees		$ 400,204	$ (400,204)			$ (400,204)
Asset Gain/(Loss)		$ 1,354,929	$ (1,354,929)		$ 1,083,943	$ (270,986)
Benefit Payouts	$ (1,450,682)	$ (1,450,682)	$ -			$ -
Administrative Expenses		$ (11,292)	$ 11,292			$ 11,292
Other		$ 651	$ (651)			$ (651)
Net Changes	**$ 370,100**	**$ 2,105,670**	**$ (1,735,570)**	**$ 210,395**	**$ 1,723,933**	**$ 261,856**
Balance End of Year	**$ 26,484,513**	**$ 20,100,579**	**$ 6,383,934**			

** Pension Expense from Experience in the Current Reporting Period.*

GASB Statement No. 68 Reconciliation (Dollars in Thousands)
Current and Prior Reporting Periods

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Net Deferred Outflows Prior Year	Total Pension Expense*
Balance Beginning of Year	**$ 26,114,413**	**$ 17,994,909**	**$ 8,119,504**				
Changes for the Year:							
Service Cost	$ 471,706		$ 471,706				$ 471,706
Interest on Total Pension Liability	$ 1,921,869		$ 1,921,869				$ 1,921,869
Interest on Fiduciary Net Position		$ 1,327,972	$ (1,327,972)				$ (1,327,972)
Changes in Benefit Terms	$ -		$ -				$ -
Liability Experience Gains and Losses	$ 280,527		$ 280,527	$ 210,395	$ 410,694	$ (635,559)	$ (154,733)
Changes in Assumptions	$ (853,320)		$ (853,320)	$ 1,059,869	$ 639,990	$ 1,751,180	$ 477,981
Contributions - Employer		$ 483,888	$ (483,888)				
Contributions - Employees		$ 400,204	$ (400,204)				$ (400,204)
Asset Gain/(Loss)		$ 1,354,929	$ (1,354,929)	$ 1,125,175	$ 1,401,258	$ 906,487	$ (172,359)
Benefit Payouts	$ (1,450,682)	$ (1,450,682)	$ -				
Administrative Expenses		$ (11,292)	$ 11,292				$ 11,292
Other		$ 651	$ (651)				$ (651)
Net Changes	**$ 370,100**	**$ 2,105,670**	**$ (1,735,570)**				**$ 826,929**
Balance End of Year	**$ 26,484,513**	**$ 20,100,579**	**$ 6,383,934**	**$ 2,395,439**	**$ 2,451,942**	**$ 2,022,108**	

** Pension Expense from Experience in the Current and Prior Reporting Periods.*

Summary of Population Statistics

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
GERP Members on 7/1/2016	**148,745**	**52,516**	**132,416**	**81,911**	**3,830**	**8,547**	**427,965**
New members	18,849	0	0	0	0	0	**18,849**
Return to active	3,007	(914)	(2,093)	0	0	0	**0**
Terminated non-vested	(8,102)	0	8,102	0	0	0	**0**
Service retirements	(3,286)	(2,750)	0	6,036	0	0	**0**
Terminated deferred	(3,813)	3,813	0	0	0	0	**0**
Terminated refund/transfer	(2,243)	(970)	(1,361)	0	0	0	**(4,574)**
Deaths	(194)	(128)	(299)	(2,247)	(183)	(522)	**(3,573)**
New beneficiary	0	0	0	0	0	642	**642**
Disabled	(99)	0	0	0	99	0	**0**
Data adjustments	3	707	1,570	77	33	(22)	**2,368**
Net change	4,122	(242)	5,919	3,866	(51)	98	**13,712**
GERP Members on 6/30/2017	**152,867**	**52,274**	**138,335**	**85,777**	**3,779**	**8,645**	**441,677**

SECTION E

SUMMARY OF BENEFITS

Summary of Plan Provisions - Basic

Following is a summary of the major plan provisions used in the valuation of this report. PERA 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 public employee who is not covered under the Social Security Act. General exceptions are employees covered by other public funds, certain part-time employees and full-time students under age 23.
Contributions	Shown as a percent of salary: Member 9.10% of salary Employer 11.78% of salary Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
Allowable service	Service during which member contributions were made. May also include certain leaves of absence and military service.
Salary	Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts and employer-paid deferred compensation deposits, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage.
Average salary	Average of the five highest successive years of annual salary. Average salary is based on all Allowable Service if less than five years.
Vesting	Hired before July 1, 2010: 100% vested after 3 years of Allowable Service. Hired after June 30, 2010: 100% vested after 5 years of Allowable Service. (Not applicable since all Basic members were hired before 1968.)
Retirement	
Normal retirement benefit	
Age/service requirement	Age 65 and vested. Proportionate retirement annuity is available at age 65 and one year of Allowable Service.
Amount	2.70% of Average Salary for each year of Allowable Service.
Early retirement benefit	
Age/service requirement	(a.) Age 55 and vested. (b.) Any age with 30 years of Allowable Service. (c.) Rule of 90: Age plus Allowable Service totals 90.

Summary of Plan Provisions – Basic (Continued)

Retirement (Continued)

Early retirement benefit (Continued)

Age/service requirement	The greater of (a) or (b):
Amount	(a.) 2.20% of Average Salary for each of the first ten years of Allowable Service and 2.70% of Average Salary for each subsequent year with reduction of 0.25% for each month if the Member is under age 65 at time of retirement and has less than 30 years of Allowable Service or if the Member is under age 62 and has 30 or more years of Allowable Service. No reduction if age plus years of Allowable Service totals 90. (b.) 2.70% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the Member is under age 65.
Form of payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 25%, 50%, 75% or 100% Joint and Survivor. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan.
Benefit increases	Benefit recipients receive a future annual 1.00% post-retirement benefit increase. If the funding ratio reaches 90% for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. Members retired under laws in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is the greater of $25 times each full year of Allowable Service or the difference between $400 times each full year of Allowable Service and the sum of benefits paid from any Minnesota public pension plan plus cash payments from the Social Security Administration for the preceding fiscal year July 1, 1988 through June 30, 1989. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from the fund. Effective January 1, 2002, annual lump sum payment is divided by 12 and paid as a monthly life annuity in the annuity form elected.

Summary of Plan Provisions – Basic (Continued)

Disability

Disability benefit

Age/service requirement	Total and permanent disability before normal retirement age if vested. Since all remaining active Basic members are over normal retirement age, none are eligible for disability benefits.
Amount	Normal Retirement benefit based on Allowable Service and Average Salary at disability without reduction for commencement before Normal Retirement Age. Supplemental benefit of $25 per month payable to the later of the normal retirement age or the five-year anniversary of commencement of disability. The disability benefit is reduced to that amount which, when added to Workers' Compensation, does not exceed the salary the disabled Member received as of the date of the disability or the salary currently payable for the same employment position substantially similar to the one the person held as of the date of the disability, whichever is greater. If a member becomes disabled prior to July 1, 1997 but did not commence his or her benefit before July 1, 1997, the benefit payable is calculated under the laws in effect at the time the Member became disabled and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. Payments stop earlier if disability ceases. If death occurs prior to age 65, or within five years of disability, the surviving spouse can receive a refund or a survivor benefit. Dependent children are entitled to dependent child benefits subject to the 70.00% family maximum. Payments revert to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.

Retirement after disability

Age/service requirement	Normal retirement age.
Amount	Any optional annuity continues. Otherwise, the larger of the disability benefit paid before normal retirement age or the normal retirement benefit available at normal retirement age, or an actuarially equivalent optional annuity.
Benefit increases	Same as for retirement.

Summary of Plan Provisions - Basic (Continued)

Death	
Surviving spouse benefit	
Age/service requirement	Active Member with 18 months of Allowable Service or while Member is receiving a disability benefit.
Amount	50.00% of salary averaged over last six months. Family benefit is maximum of 70.00% and minimum of 50.00% of average salary. Benefit paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991. If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit as of July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. Surviving spouse optional annuity may be elected in lieu of this benefit.
Benefit increases	Same as for retirement.
Surviving dependent children's benefit	
Age/service requirement	Active Member with 18 months of Allowable Service or while Member is receiving a disability benefit.
Amount	10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 50.00% of salary and maximum of 70.00% of average salary. Benefits paid until child marries, dies, or attains age 18 (age 22 if full-time student). If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.

Summary of Plan Provisions - Basic (Continued)

Death (Continued)	
Surviving spouse optional annuity	
Age/service requirement	Member or former Member who dies before retirement benefits commence and other survivor annuity is waived by spouse.
Amount	Survivor's payment of the 100% joint and survivor benefit the Member could have elected if terminated or an actuarial equivalent term certain annuity. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced the same as early retirement with half the applicable reduction factor used from age 55 to the actual commencement age. If no surviving spouse, then an actuarial equivalent dependent child benefit is paid to age 20 or for five years if longer. If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit as of July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.
Refund of contributions with interest	
Age/service requirement	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	The excess of the Member's contributions with 6.00% interest until June 30, 2011; 4.00% interest thereafter over any disability or survivor benefits paid.
Termination	
Refund of contributions	
Age/service requirement	Termination of public service.
Amount	If member terminated before July 1, 2011, member's contributions credited with 6% interest compounded annually prior to July 1, 2011 and 4% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually. A deferred annuity may be elected in lieu of a refund if three or more years of Allowable Service.

Termination (Continued)	
Deferred benefit	
Age/service requirement	Fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following "augmentation" percentage compounded annually for terminations prior to 2012: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (d.) 5.00% thereafter until the earlier of the date the annuity begins and January 1, 2012; and (e.) 1.00% from January 1, 2012 thereafter. Members who terminate after 2011 will receive no future augmentation. Members active with a public employer the day prior to the privatization of the employer become vested immediately and receive enhanced augmentation (unless the enhancement results in a net loss to the Plan). Amount is payable at a normal or early retirement. Augmentation equals 2.00% compounded annually, unless the enhancement results in a net loss to the Plan, in which case augmentation equals 1.00% compounded annually. If privatization occurred prior to January 1, 2011, augmentation occurs at the rate of 4.00% compounded annually through the year the Member turns age 55 and 6.00% thereafter until the annuity begins. If privatization occurred prior to January 1, 2007 (or January 1, 2008 for Hutchinson Area Health Care), augmentation occurs at the rate of 5.50% compounded annually through the year the Member turns age 55 and 7.50% thereafter until the annuity begins. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and 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 the RP-2000 mortality table for healthy annuitants, white collar adjustment, projected to 2025, females set back two years and no setback for males, blended 45% males, 7.50% post-retirement interest, and 8.50% pre-retirement interest.

Summary of Plan Provisions - Basic (Concluded)

Combined service annuity	Members are eligible for combined service benefits if they: (a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or (b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010). Other requirements for combined service include: (a.) Member must have at least six months of allowable service credit in each plan worked under; and (b.) Member may not be in receipt of a benefit from another plan. Members who meet the above requirements must have their benefit based on the following: (a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement; and (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Changes in plan provisions	There have been no changes to plan provisions since the previous valuation.

Summary of Plan Provisions - Coordinated

Following is a summary of the major plan provisions used in the valuation of this report. PERA 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 public employee who is covered under the Social Security Act. General exceptions are employees covered by other public funds, certain part-time employees and full-time students under age 23. City managers and persons holding certain elective office positions may choose to become Members.	
Contributions	Shown as a percent of salary:	
Effective date	**Member**	**Employer**
January 1, 2015	6.50%	7.50%
	Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).	
Allowable service	Service during which member contributions are deducted. May also include certain leaves of absence and military service.	
Salary	Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leave and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts and employer-paid deferred compensation deposits, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage.	
Average salary	Average of the five highest successive years of annual salary. Average salary is based on all Allowable Service if less than five years.	
Vesting	Hired before July 1, 2010: 100% vested after three years of Allowable Service. Hired after June 30, 2010: 100% vested after five years of Allowable Service.	
Retirement		
Normal retirement benefit		
Age/service requirement	First hired before July 1, 1989: (a.) Age 65 and vested. (b.) Proportionate retirement annuity is available at age 65 and one year of Allowable Service.	
Amount	1.70% of Average Salary for each year of Allowable Service.	

Retirement (Continued)

Normal retirement benefit (Continued)

Age/service requirement	First hired after June 30, 1989: (a.) The greater of age 65 or the age eligible for full Social Security retirement benefits but no later than age 66 and vested. (b.) Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service.
Amount	1.70% of Average Salary for each year of Allowable Service.

Early retirement benefit

Age/service requirement	First hired before July 1, 1989: (a.) Age 55 and vested. (b.) Any age with 30 years of Allowable Service. (c.) Rule of 90: Age plus Allowable Service totals 90. First hired after June 30, 1989: (a.) Age 55 and vested.
Amount	First hired before July 1, 1989: The greater of (a) or (b): (a.) 1.20% of Average Salary for each of the first ten years of Allowable Service and 1.70% of Average Salary for each subsequent year with reduction of 0.25% for each month the Member is under age 65 at time of retirement or under age 62 if 30 years of Allowable Service. No reduction if age plus years of Allowable Service totals 90. (b.) 1.70% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the Member is under age 65. First hired after June 30, 1989: (a.) 1.70% of Average Salary for each year of Allowable Service assuming augmentation to normal retirement age at 3.00% per year (2.50% if hired after June 30, 2006) and actuarial reduction for each month the Member is under normal retirement age.
Form of payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 25%, 50%, 75% or 100% Joint and Survivor. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan.

Summary of Plan Provisions – Coordinated (Continued)

Retirement (Continued)	
Benefit increases	Benefit recipients receive a future annual 1.00% post-retirement benefit increase. If the funding ratio reaches 90% for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. Members retired under laws in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is $25 times each full year of Allowable Service. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from the fund.
Disability	
Disability benefit	
Age/service requirement	Total and permanent disability before normal retirement age if vested.
Amount	Normal Retirement benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age. The disability benefit is reduced to that amount which, when added to Workers' Compensation, does not exceed the salary the disabled Member received as of the date of the disability or the salary currently payable for the same employment position substantially similar to the one the person held as of the date of the disability, whichever is greater. If a Member becomes disabled prior to July 1, 1997 but did not commence his or her benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. Payments stop if disability ceases or death occurs. Payments change to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.

Summary of Plan Provisions – Coordinated (Continued)

Disability (Continued)	
Retirement after disability	
Age/service requirement	Normal retirement age.
Amount	Any optional annuity continues. Otherwise, the larger of the disability benefit paid before normal retirement age or the normal retirement benefit available at normal retirement age, or an actuarially equivalent optional annuity.
Benefit increases	Same as for retirement.
Death	
Surviving spouse optional annuity	
Age/service requirement	Member or former Member who dies before retirement or disability benefits commence.
Amount	Survivor's payment of the 100% joint and survivor benefit the Member could have elected if terminated or an actuarial equivalent term certain annuity. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced the same as early retirement with half the applicable reduction factor used from age 55 to the actual commencement age. If no surviving spouse, then an actuarial equivalent dependent child benefit is paid to age 20 or for five years if longer. If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.
Refund of contributions	
Age/service requirement	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	The excess of the Member's contributions with 6.00% interest until June 30, 2011; 4.00% interest thereafter over any disability or survivor benefits paid.
Termination	
Refund of contributions	
Age/service requirement	Termination of public service.
Amount	If member terminated before July 1, 2011, member's contributions credited with 6.00% interest compounded annually prior to July 1, 2011 and 4.00% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4.00% interest compounded annually. A deferred annuity may be elected in lieu of a refund if vested.

Summary of Plan Provisions – Coordinated (Continued)

Termination (Continued)	
Deferred benefit	
Age/service requirement	Fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following percentage (augmentation) compounded annually for terminations prior to 2012: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (d.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; or (e.) 1.00% from January 1, 2012 to when the benefit begins. Members who terminate after 2011 will receive no future augmentation. Members active with a public employer the day prior to the privatization of the employer become vested immediately and receive enhanced augmentation (unless the enhancement results in a net loss to the Plan). Amount is payable at a normal or early retirement. Augmentation equals 2.00% compounded annually, unless the enhancement results in a net loss to the Plan, in which case augmentation equals 1.00% compounded annually. If privatization occurred prior to January 1, 2011, augmentation occurs at the rate of 4.00% compounded annually through the year the Member turns age 55 and 6.00% thereafter until the annuity begins. If privatization occurred prior to January 1, 2007 (or January 1, 2008 for Hutchinson Area Health Care), augmentation occurs at the rate of 5.50% compounded annually through the year the Member turns age 55 and 7.50% thereafter until the annuity begins. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and 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.
Actuarial equivalent factors	Actuarially equivalent factors based on the RP-2000 mortality table for healthy annuitants, white collar adjustment, projected to 2025, females set back two years and no set back for males, blended 45% males, 7.50% post-retirement interest and 8.50% pre-retirement interest. The post-retirement interest rate will change to 6.50% on the earlier of the effective date of the next mortality adjustment or July 1, 2017.

Summary of Plan Provisions – Coordinated (Concluded)

Combined service annuity	Members are eligible for combined service benefits if they: (a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or (b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010). Other requirements for combined service include: (a.) Member must have at least six months of allowable service credit in each plan worked under; and (b.) Member may not be in receipt of a benefit from another plan. 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.
Contribution Stabilizer	The following is a summary of contribution stabilizer provisions in Minnesota Statute 353.27: • If a contribution sufficiency of more than 1.00% exists, member and employer contributions may be adjusted by the Board of Directors to a level necessary to maintain a 1.00% sufficiency. Member and employer contributions may not be less than the sum of normal cost and administrative expenses. • If a contribution deficiency of at least 0.50% exists, the member and employer contribution rates may be increased by the Board of Directors to eliminate the deficiency. • Any adjustment to the contribution rates must be reported to the Legislative Commission on Pensions and Retirement (LCPR) by January 15 following the most recent valuation report. If the LCPR does not recommend against or alter the change in rates, the adjustment becomes effective on the salary paid after the next January 1st.
Changes in Plan Provisions	There have been no changes to plan provisions since the previous valuation.

Summary of Plan Provisions – Minneapolis Employees Retirement Fund (MERF)

Following is a summary of the major plan provisions used in the valuation of this report. PERA 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/employee rule	An employee of the City of Minneapolis, the Metropolitan Airports Commission, the Met Council/Environmental Services, the Municipal Employees Retirement Fund, and Special School District No. 1 if covered prior to July 1, 1978. Employees covered July 1, 1978 or later are covered by the Public Employees Retirement Association (PERA) Plan. Effective July 1, 1992, licensed peace officers and firefighters who are employed by the Metropolitan Airports Commission and covered by the Minneapolis Employees Retirement Fund will receive the greater of retirement, disability, or survivor benefits under: a) The Minneapolis Employees Retirement Fund; or b) The Public Employees Retirement Association (PERA) Police & Fire Plan.
Full consolidation	The MERF Division fully merged with PERA's General Employees Retirement Plan, effective January 1, 2015. Upon consolidation, state and employer contributions were revised as shown herein
Contributions	
Member	9.75% of salary
Employer	9.75% of salary (Employer Regular Contributions) Employer Regular and Additional Contributions will be paid as long as there are active members. Employer Supplemental Contribution equals $31,000,000 in calendar years 2017 and 2018 and 21,000,000 in calendar years 2019 to 2031.
Contribution allocation	Employer Supplemental Contributions are allocated to the employers in proportion to their share of the actuarial accrued liability of MERF on July 1, 2009, as follows:

Employer	Allocation
City of Minneapolis	54.78%
Minneapolis Park Board	10.33%
Met Council	1.74%
Metropolitan Airport Commission	5.76%
Municipal Building Commission	1.08%
Minneapolis School District No. 1	23.04%
Hennepin County	3.17%
MnSCU	0.10%
Total	100.00%

Summary of Plan Provisions –
Minneapolis Employees Retirement Fund (MERF) (Continued)

State contributions	The State's contribution equals $16,000,000 in 2017 and 2018, and $6,000,000 thereafter. The State's contributions are payable by September 30 each year and end on September 15, 2031.
Allowable service	Service during which member contributions were made. Allowable Service may also include certain leaves of absence, military service and service prior to becoming a member. Allowable service also includes time on duty disability provided that the member returns to active service if the disability ceases.
Salary	All amounts of salary, wages or compensation.
Average salary	Average of the five highest calendar years of salary out of the last ten calendar years.
Retirement	
Normal retirement benefit	
Age/service requirement	Age 60 and 10 years of employment. Any age with 30 years of employment. Proportionate retirement annuity is available at age 65 and 1 year allowable service.
Amount	2.00% of average salary for the first 10 years of allowable service plus 2.50% of average salary for each subsequent year of allowable service.

Summary of Plan Provisions – Minneapolis Employees Retirement Fund (MERF) (Continued)

Disability

<u>Disability benefit</u>

Age/service requirement	Total and permanent disability before age 60 with five years of allowable service, or no allowable service if a work-related disability.
Amount	2.00% of average salary for the first 10 years of disability service plus 2.50% of average salary for each subsequent year of disability service. Disability service is the greater of (a) or (b) where: (a.) equals allowable service plus service projected to age 60, subject to a maximum of 22 years, and (b.) equals allowable service. Benefit is reduced by Workers' Compensation benefits. Payments stop at age 60 or earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment.

<u>Disability after separation</u>

Age/service requirement	Total and permanent disability after electing to receive a retirement benefit but before age 60.
Amount	Actuarial equivalent of total credit to member's account.

<u>Retirement after disability</u>

Age/service requirement	Total and permanent disability after electing to receive a retirement benefit but before age 60. Employee is still disabled after age 60.
Amount	Benefit continues according to the option selected.

Summary of Plan Provisions –
Minneapolis Employees Retirement Fund (MERF) (Continued)

Death	
Pre-retirement survivor's spouse benefit	
Age/service requirement	Active member with 18 months of allowable service.
Amount	30% of salary averaged over the last six months to the surviving spouse plus 10% of salary averaged over the last six months to each surviving child. Maximum benefit is $900 per month.
Pre-retirement survivor's spouse annuity	
Age/service requirement	Active member or former member who dies before retirement with 20 years of allowable service.
Amount	Actuarial equivalent of a single life annuity which would have been paid as a retirement benefit on the date of death without regard to eligibility age for retirement benefit. If there is no surviving spouse, the designated beneficiary may be a dependent child or dependent parent.
Refund of accumulated city contributions	
Age/service requirement	Active member or former member dies after 10 years of allowable service and prior to retirement.
Amount	Present value of the City's annual installments of $60 or, in the case of a former member, the net accumulation of city deposits. This benefit is not payable if survivor's benefits are paid.
Lump sum	
Age/service requirement	Death prior to service or disability retirement without an eligible surviving beneficiary.
Amount	$750 with less than 10 years allowable service, or $1,500 with 10 or more years of allowable service.
Refund of member contributions at death	
Age/service requirement	Active member or former member dies before retirement.
Amount	The excess of the member's contributions (exclusive of the contributions to the survivor's account) plus interest to the date of death.

Summary of Plan Provisions –
Minneapolis Employees Retirement Fund (MERF) (Concluded)

Termination	
Deferred benefit	
Age/service requirement	Three years of allowable service.
Amount	Benefit computed under law in effect at termination and increased by the following percentage (augmentation), compounded annually: (a.) 0.00% prior to July 1, 1971, (b.) 5.00% from July 1, 1971 to January 1, 1981, and (c.) 3.00% thereafter until the annuity begins. Amount is payable at or after age 60.
Refund of member contributions upon termination	
Age/service requirement	Termination of public service.
Amount	Member's contributions with interest. A deferred annuity may be elected in lieu of a refund if vested.
Form of payment	▪ Life annuity. ▪ Life annuity with 3, 5, 10 or 15 years guaranteed. ▪ Life annuity with lump sum death benefit. ▪ Joint & Survivor (with or without bounce back feature).
Optional form conversion factors	1986 PET mortality table with a one year setback, blended 50% male and 50% female, and 5% interest.
Two dollar bill and annuity	Optional Two Dollar Bill money purchase annuity available at age 55 with 20 years of service if member had service prior to June 28, 1973. According to PERA, this option is rarely utilized. We have assumed that remaining active members will not elect this optional benefit.
Benefit increases	Benefit recipients receive future annual 1.00% benefit increases. If the accrued liability funding ratio of the General Employees Retirement Plan reaches 90% (on a market value of assets basis) for two consecutive years, the benefit increase will change to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.
Changes in plan provisions	The Employer Supplemental Contribution changed from $21,000,000 to $31,000,000 in calendar years 2019 to 2031. The state's contribution changed from $16,000,000 to $6,000,000 in calendar years 2019 to 2031.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED VALUES

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 1.00% post-retirement benefit increase. If the funding ratio reaches 90% (based on a 2.50% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.

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 (rate of 11.50% at year 1 declining to 3.50% at years 26 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 1.00% per year until the funding ratio threshold required to pay a 2.50% postretirement benefit increase is reached
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by PERA

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay a 2.50% postretirement benefit increase in 2044. A 1.00% postretirement benefit increase assumption through 2044 and a 2.5% postretirement benefit increase thereafter are assumed in our calculations.

Asset Valuation Method

Fair value of assets.

Summary of Actuarial Assumptions – Basic and Coordinated

The following assumptions were used in valuing the liabilities and benefits under the plan. The assumptions are based on the last experience study dated June 30, 2015, reviews of inflation and investment assumptions, dated September 11, 2014 and September 11, 2017, and a recent asset liability study obtained by the State Board of Investment.

The Allowance for Combined Service Annuity assumptions are based on an analysis completed by the LCPR actuary and documented in a report dated October 2016.

Investment return	7.50% per annum.
Single Discount Rate	7.50% per annum.
Benefit increases after retirement	1.00% per annum through 2044 and 2.50% per annum thereafter.
Salary increases	Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service earned during the year.
Inflation	2.50% per year.
Payroll growth	3.25% per year.
Mortality rates Healthy pre-retirement	RP-2014 Employee Mortality Table, adjusted for white collar and mortality improvements using projection scale MP-2015, from a base year of 2014. Rates are set forward one year for males and set back one year for females.
Healthy post-retirement	RP-2014 Healthy Annuitant Mortality Table, adjusted for white collar and mortality improvements using projection scale MP-2015, from a base year of 2014. Rates are set forward two years for males. Female rates are multiplied by a factor of 0.90.
Disabled retirees	RP-2014 Disabled Mortality Table, adjusted for mortality improvements using projection scale MP-2015, from a base year of 2014. Rates are set forward one year for males and set forward six years for females. 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 tables. Members who have attained the highest assumed retirement age are assumed to retire in one year.
Withdrawal	Service-related rates based on experience; see table of sample rates.
Disability	Age-related rates based on experience; see table of sample rates.

Summary of Actuarial Assumptions – Basic and Coordinated (Continued)

Allowance for combined service annuity	Liabilities for former members are increased by 15.0% for vested members and 3.0% for non-vested members to account for the effect of some participants having eligibility for a Combined Service Annuity.
Administrative expenses	In the valuation year, equal to prior year administrative expenses expressed as a 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 accumulate interest until normal retirement dates are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at Normal Retirement.
Percentage married	80% of male and 70% of female active members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Males are assumed to have a beneficiary three years younger, while females are assumed to have a beneficiary two years older. For members in payment status, actual spouse date of birth is used, if provided.
Eligible children	Retiring members are assumed to have no dependent children.
Form of payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 10% elect 25% Joint & Survivor option 15% elect 50% Joint & Survivor option 10% elect 75% Joint & Survivor option 35% elect 100% Joint & Survivor option Females: 10% elect 25% Joint & Survivor option 10% elect 50% Joint & Survivor option 5% elect 75% Joint & Survivor option 15% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option. Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.
Decrement operation	Withdrawal decrements do not operate during retirement eligibility. Decrements are assumed to occur mid-fiscal year.
Service credit accruals	It is assumed that members accrue one year of service credit per year.
Pay increases	Pay increases are assumed to happen at the beginning of the fiscal year. This is equivalent to assuming that reported earnings are pensionable earnings for the year ending on the valuation date.

Summary of Actuarial Assumptions – Basic and Coordinated (Continued)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members:</u> There were 3,636 members reported with a salary less than $100. We used prior year salary (2,452 members), if available; otherwise high five salary with a 10% load to account for salary increases (1,057 members). If neither prior year salary or high five salary was available, we assumed a value of $35,000. There were also 2,339 members reported without a gender and 51 members reported with an invalid date of birth. We assumed a date of birth based on an entry age of 38 and female gender. <u>Data for terminated members:</u> We calculated benefits for these members using the reported Average Salary and credited service. If Average Salary was not reported (186 members), we assumed a value of $24,000. If credited service was not reported (141 members), we assumed credited service was elapsed time from hire to termination date (92 members); otherwise nine years. If termination date was invalid or not reported (116 members), we assumed the termination date was equal to hire date plus credited service; otherwise the valuation date unless they are noted as a pre-July 1, 1989 hire, then June 30, 1989. If reported termination date occurs prior to reported hire date, the two dates were swapped. There were 44 members reported with an invalid date of birth and 272 members reported without a gender. We assumed a date of birth of July 1, 1967 and female gender. <u>Data for retired members:</u> There were 106 members reported without a gender. We assumed retirees are female and beneficiaries are male. There were 8 members reported with an invalid date of birth. We assumed a date of birth of July 1, 1945. There were 595 members that were active last year, and retirement eligible, and not on the retiree data file this year. At the direction of PERA, we included these members in the 2017 valuation as retirees with an estimated life only monthly benefit.

Summary of Actuarial Assumptions – Basic and Coordinated (Continued)

Unknown data for certain members (Continued)	<u>Data for retired members (Continued):</u> Because PERA reclassifies disabled members as retirees once the member reaches Normal Retirement Age, we compare the members that PERA reports as retirees to our disabled group from the last valuation. If a member was disabled in the valuation, we reclassify that member as a disabled retiree in this year's valuation. We reclassified 2,142 retirees as disabled retirees in this valuation.
Changes in actuarial assumptions	The Combined Service Annuity (CSA) loads were 0.8% for active members (0.2% for active MERF members) and 60.0% for vested and non-vested deferred member liability (30.0% for deferred MERF members). The revised CSA loads are now 0.0% for active member liability, 15.0% for vested deferred member liability, and 3.0% for non-vested deferred member liability. The assumed post-retirement benefit increase rate was changed from 1.00% per year for all years to 1.00% per year through 2044 and 2.50% per year thereafter. For accounting purposes, this change was treated as a difference between expected and actual experience.

Summary of Actuarial Assumptions – Basic and Coordinated (Continued)

	Percentage of Members Dying Each Year*					
	Healthy Post-Retirement Mortality		Healthy Pre-Retirement Mortality		Disability Mortality	
Age in 2017	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
20	0.03%	0.01%	0.03%	0.01%	0.06%	0.10%
25	0.04	0.02	0.03	0.01	0.23	0.24
30	0.06	0.04	0.03	0.02	0.52	0.46
35	0.09	0.07	0.04	0.02	0.89	0.71
40	0.14	0.10	0.04	0.03	1.27	0.95
45	0.20	0.13	0.07	0.05	1.61	1.17
50	0.29	0.18	0.12	0.08	1.93	1.42
55	0.42	0.24	0.21	0.13	2.29	1.74
60	0.59	0.34	0.36	0.19	2.69	2.16
65	0.89	0.56	0.63	0.27	3.22	2.90
70	1.47	0.90	1.10	0.46	4.08	4.21

* *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.*

	Disability Retirement	
Age	**Male**	**Female**
20	0.01%	0.01%
25	0.01	0.01
30	0.01	0.01
35	0.03	0.02
40	0.05	0.04
45	0.08	0.05
50	0.15	0.10
55	0.34	0.16
60	0.53	0.28
65	0.00	0.00
70	0.00	0.00

Summary of Actuarial Assumptions – Basic and Coordinated (Concluded)

	Retirement		
Age	**Rule of 90 Eligible**	**Tier 1**	**Tier 2**
55	20.0%	5.0%	5.0%
56	15.0%	5.0%	5.0%
57	15.0%	5.0%	5.0%
58	15.0%	6.0%	5.0%
59	15.0%	7.0%	6.0%
60	15.0%	8.0%	7.0%
61	18.0%	10.0%	9.0%
62	35.0%	20.0%	15.0%
63	25.0%	20.0%	15.0%
64	25.0%	25.0%	15.0%
65	32.5%	32.5%	25.0%
66	25.0%	25.0%	25.0%
67	20.0%	20.0%	20.0%
68	17.5%	17.5%	17.5%
69	15.0%	15.0%	15.0%
70	17.5%	17.5%	17.5%
71+	100.0%	100.0%	100.0%

Summary of Actuarial Assumptions – Basic and Coordinated (Concluded)

Salary Scale	
Year	Increase
1	11.25%
2	8.25%
3	6.75%
4	5.75%
5	5.25%
6	4.95%
7	4.65%
8	4.55%
9	4.45%
10	4.25%
11	4.00%
12	3.85%
13	3.75%
14	3.65%
15	3.65%
16	3.60%
17	3.55%
18	3.50%
19	3.50%
20	3.50%
21	3.50%
22	3.45%
23	3.35%
24	3.35%
25	3.35%
26+	3.25%

	% Withdrawals	
Year	Male	Female
1	25.00%	25.00%
2	20.00	20.00
3	15.00	15.00
4	10.00	11.00
5	9.00	10.00
6	7.00	9.00
7	5.50	7.50
8	5.00	6.50
9	4.50	5.50
10	4.00	5.00
11	3.25	4.25
12	3.00	4.00
13	2.75	3.75
14	2.50	3.50
15	2.50	3.25
16	2.25	3.00
17	2.00	2.75
18	1.75	2.50
19	1.50	2.50
20	1.50	2.25
21	1.50	2.25
22	1.50	2.25
23	1.00	2.00
24	1.00	2.00
25	1.00	1.75
26	1.00	1.75
27	1.00	1.50
28	1.00	1.50
29	1.00	1.50
30	1.00	1.50

Summary of Actuarial Assumptions - MERF

The following assumptions were used in valuing the liabilities and benefits under the plan for MERF members only. Assumptions regarding investment return, mortality, benefit increases, and Combined Service Annuity (CSA) are the same as shown in the Basic and Coordinated Plan assumption summary.

Salary increases	Total reported pay for prior calendar year increased 1.73% (half year of 3.50%, compounded) to prior fiscal year and 3.50% annually for each future year.
Retirement	Active members are assumed to retire at age 61, or immediately if currently age 61 or older.
Withdrawal	Rates are shown in rate table.
Disability	Age-related rates based on experience; see table of sample rates.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 60.
Percentage married	66.67% of active members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Females are assumed to be three years younger than their male spouses. For members in payment status, actual spouse date of birth is used, if provided.
Eligible children	Retiring members are assumed to have no dependent children.
Form of payment	Members are assumed to elect a life annuity.
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: There were no members with missing or invalid dates of birth. <u>Data for active members:</u> There were no active members with missing salary or service. <u>Data for terminated members:</u> Benefits were provided by PERA for five members. For the remaining members, we calculated benefits using the reported Average Salary, credited service and termination date from the 2016 valuation data file. <u>Data for Retired members:</u> There were no members reported with missing benefits. There was one member reported without a gender. We assumed male gender.

Summary of Actuarial Assumptions – MERF (Concluded)

	Withdrawal		Disability Retirement	
Age	Male	Female	Male	Female
20	21.00%	21.00%	0.21%	0.21%
25	11.00	11.00	0.21	0.21
30	5.00	5.00	0.23	0.23
35	1.50	1.50	0.30	0.30
40	1.00	1.00	0.41	0.41
45	1.00	1.00	0.61	0.61
50	1.00	1.00	0.93	0.93
55	1.00	1.00	1.60	1.60
60	1.00	1.00	0.00	0.00
65	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan 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 assumed long-term expected rate of return is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a "risk-free" rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 3.56%; and **the resulting single discount rate 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 (SDR). 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)

	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
2017	$ 6,156,985	$ -	$ 6,156,985					
2018	$ 6,187,110	$ -	$ 6,187,110	$ 402,162	$ 464,033	$ -	$ 37,000	$ 903,195
2019	$ 5,836,830	$ 551,361	$ 6,388,191	$ 379,394	$ 437,762	$ 30,380	$ 37,000	$ 884,536
2020	$ 5,530,048	$ 1,065,759	$ 6,595,807	$ 359,453	$ 414,754	$ 58,723	$ 37,000	$ 869,930
2021	$ 5,271,731	$ 1,538,440	$ 6,810,171	$ 342,663	$ 395,380	$ 84,768	$ 37,000	$ 859,811
2022	$ 5,032,043	$ 1,999,458	$ 7,031,501	$ 327,083	$ 377,403	$ 110,170	$ 37,000	$ 851,656
2023	$ 4,805,140	$ 2,454,885	$ 7,260,025	$ 312,334	$ 360,386	$ 135,264	$ 37,000	$ 844,984
2024	$ 4,589,621	$ 2,906,355	$ 7,495,976	$ 298,325	$ 344,222	$ 160,140	$ 37,000	$ 839,687
2025	$ 4,386,940	$ 3,352,655	$ 7,739,595	$ 285,151	$ 329,021	$ 184,731	$ 37,000	$ 835,903
2026	$ 4,196,234	$ 3,794,898	$ 7,991,132	$ 272,755	$ 314,718	$ 209,099	$ 37,000	$ 833,572
2027	$ 4,015,093	$ 4,235,751	$ 8,250,844	$ 260,981	$ 301,132	$ 233,390	$ 37,000	$ 832,503
2028	$ 3,841,500	$ 4,677,496	$ 8,518,996	$ 249,697	$ 288,112	$ 257,730	$ 37,000	$ 832,539
2029	$ 3,674,779	$ 5,121,085	$ 8,795,864	$ 238,861	$ 275,608	$ 282,172	$ 37,000	$ 833,641
2030	$ 3,514,698	$ 5,567,031	$ 9,081,729	$ 228,455	$ 263,602	$ 306,743	$ 37,000	$ 835,800
2031	$ 3,360,039	$ 6,016,846	$ 9,376,885	$ 218,403	$ 252,003	$ 331,528	$ 37,000	$ 838,934
2032	$ 3,209,396	$ 6,472,238	$ 9,681,634	$ 208,611	$ 240,705	$ 356,620	$ -	$ 805,936
2033	$ 3,061,057	$ 6,935,230	$ 9,996,287	$ 198,969	$ 229,579	$ 382,131	$ -	$ 810,679
2034	$ 2,915,205	$ 7,405,962	$ 10,321,167	$ 189,488	$ 218,640	$ 408,069	$ -	$ 816,197
2035	$ 2,772,786	$ 7,883,818	$ 10,656,604	$ 180,231	$ 207,959	$ 434,398	$ -	$ 822,588
2036	$ 2,633,308	$ 8,369,636	$ 11,002,944	$ 171,165	$ 197,498	$ 461,167	$ -	$ 829,830
2037	$ 2,495,467	$ 8,865,073	$ 11,360,540	$ 162,205	$ 187,160	$ 488,466	$ -	$ 837,831
2038	$ 2,359,593	$ 9,370,164	$ 11,729,757	$ 153,374	$ 176,969	$ 516,296	$ -	$ 846,639
2039	$ 2,225,087	$ 9,885,887	$ 12,110,974	$ 144,631	$ 166,882	$ 544,712	$ -	$ 856,225
2040	$ 2,090,994	$ 10,413,587	$ 12,504,581	$ 135,915	$ 156,825	$ 573,789	$ -	$ 866,529
2041	$ 1,956,492	$ 10,954,488	$ 12,910,980	$ 127,172	$ 146,737	$ 603,592	$ -	$ 877,501
2042	$ 1,821,525	$ 11,509,062	$ 13,330,587	$ 118,399	$ 136,614	$ 634,149	$ -	$ 889,162
2043	$ 1,687,892	$ 12,075,939	$ 13,763,831	$ 109,713	$ 126,592	$ 665,384	$ -	$ 901,689
2044	$ 1,556,905	$ 12,654,250	$ 14,211,155	$ 101,199	$ 116,768	$ 697,249	$ -	$ 915,216
2045	$ 1,427,996	$ 13,245,022	$ 14,673,018	$ 92,820	$ 107,100	$ 729,801	$ -	$ 929,721
2046	$ 1,300,650	$ 13,849,241	$ 15,149,891	$ 84,542	$ 97,549	$ 763,093	$ -	$ 945,184
2047	$ 1,175,701	$ 14,466,562	$ 15,642,263	$ 76,421	$ 88,178	$ 797,108	$ -	$ 961,707
2048	$ 1,053,738	$ 15,096,898	$ 16,150,636	$ 68,493	$ 79,030	$ 831,839	$ -	$ 979,362
2049	$ 935,816	$ 15,739,716	$ 16,675,532	$ 60,828	$ 70,186	$ 867,258	$ -	$ 998,272
2050	$ 823,343	$ 16,394,144	$ 17,217,487	$ 53,517	$ 61,751	$ 903,317	$ -	$ 1,018,585
2051	$ 716,587	$ 17,060,468	$ 17,777,055	$ 46,578	$ 53,744	$ 940,032	$ -	$ 1,040,354
2052	$ 616,164	$ 17,738,645	$ 18,354,809	$ 40,051	$ 46,212	$ 977,399	$ -	$ 1,063,662
2053	$ 522,772	$ 18,428,568	$ 18,951,340	$ 33,980	$ 39,208	$ 1,015,414	$ -	$ 1,088,602
2054	$ 437,214	$ 19,130,045	$ 19,567,259	$ 28,419	$ 32,791	$ 1,054,065	$ -	$ 1,115,275
2055	$ 360,702	$ 19,842,493	$ 20,203,195	$ 23,446	$ 27,053	$ 1,093,321	$ -	$ 1,143,820
2056	$ 292,608	$ 20,567,191	$ 20,859,799	$ 19,019	$ 21,946	$ 1,133,252	$ -	$ 1,174,217
2057	$ 232,522	$ 21,305,220	$ 21,537,742	$ 15,114	$ 17,439	$ 1,173,918	$ -	$ 1,206,471
2058	$ 181,084	$ 22,056,635	$ 22,237,719	$ 11,770	$ 13,581	$ 1,215,321	$ -	$ 1,240,672
2059	$ 138,132	$ 22,822,313	$ 22,960,445	$ 8,979	$ 10,360	$ 1,257,509	$ -	$ 1,276,848
2060	$ 102,922	$ 23,603,737	$ 23,706,659	$ 6,690	$ 7,719	$ 1,300,566	$ -	$ 1,314,975
2061	$ 74,780	$ 24,402,346	$ 24,477,126	$ 4,861	$ 5,609	$ 1,344,569	$ -	$ 1,355,039
2062	$ 52,587	$ 25,220,045	$ 25,272,632	$ 3,418	$ 3,944	$ 1,389,625	$ -	$ 1,396,987
2063	$ 35,293	$ 26,058,700	$ 26,093,993	$ 2,294	$ 2,647	$ 1,435,834	$ -	$ 1,440,775
2064	$ 22,342	$ 26,919,705	$ 26,942,047	$ 1,452	$ 1,676	$ 1,483,276	$ -	$ 1,486,404
2065	$ 13,158	$ 27,804,506	$ 27,817,664	$ 855	$ 987	$ 1,532,028	$ -	$ 1,533,870
2066	$ 7,307	$ 28,714,431	$ 28,721,738	$ 475	$ 548	$ 1,582,165	$ -	$ 1,583,188
2067	$ 3,841	$ 29,651,354	$ 29,655,195	$ 250	$ 288	$ 1,633,790	$ -	$ 1,634,328

* *Contributions related to future employee payroll in excess of normal cost and expenses of 8.49% of pay.*

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

	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
2068	$ 1,761	$ 30,617,227	$ 30,618,988	$ 114	$ 132	$ 1,687,009	$ -	$ 1,687,255
2069	$ 629	$ 31,613,476	$ 31,614,105	$ 41	$ 47	$ 1,741,903	$ -	$ 1,741,991
2070	$ 188	$ 32,641,376	$ 32,641,564	$ 12	$ 14	$ 1,798,540	$ -	$ 1,798,566
2071	$ 55	$ 33,702,360	$ 33,702,415	$ 4	$ 4	$ 1,857,000	$ -	$ 1,857,008
2072	$ 11	$ 34,797,732	$ 34,797,743	$ 1	$ 1	$ 1,917,355	$ -	$ 1,917,357
2073	$ 1	$ 35,928,669	$ 35,928,670	$ -	$ -	$ 1,979,670	$ -	$ 1,979,670
2074	$ -	$ 37,096,352	$ 37,096,352	$ -	$ -	$ 2,044,009	$ -	$ 2,044,009
2075	$ -	$ 38,301,983	$ 38,301,983	$ -	$ -	$ 2,110,439	$ -	$ 2,110,439
2076	$ -	$ 39,546,797	$ 39,546,797	$ -	$ -	$ 2,179,029	$ -	$ 2,179,029
2077	$ -	$ 40,832,068	$ 40,832,068	$ -	$ -	$ 2,249,847	$ -	$ 2,249,847
2078	$ -	$ 42,159,111	$ 42,159,111	$ -	$ -	$ 2,322,967	$ -	$ 2,322,967
2079	$ -	$ 43,529,282	$ 43,529,282	$ -	$ -	$ 2,398,463	$ -	$ 2,398,463
2080	$ -	$ 44,943,983	$ 44,943,983	$ -	$ -	$ 2,476,413	$ -	$ 2,476,413
2081	$ -	$ 46,404,663	$ 46,404,663	$ -	$ -	$ 2,556,897	$ -	$ 2,556,897
2082	$ -	$ 47,912,814	$ 47,912,814	$ -	$ -	$ 2,639,996	$ -	$ 2,639,996
2083	$ -	$ 49,469,981	$ 49,469,981	$ -	$ -	$ 2,725,796	$ -	$ 2,725,796
2084	$ -	$ 51,077,755	$ 51,077,755	$ -	$ -	$ 2,814,384	$ -	$ 2,814,384
2085	$ -	$ 52,737,782	$ 52,737,782	$ -	$ -	$ 2,905,852	$ -	$ 2,905,852
2086	$ -	$ 54,451,760	$ 54,451,760	$ -	$ -	$ 3,000,292	$ -	$ 3,000,292
2087	$ -	$ 56,221,442	$ 56,221,442	$ -	$ -	$ 3,097,801	$ -	$ 3,097,801
2088	$ -	$ 58,048,639	$ 58,048,639	$ -	$ -	$ 3,198,480	$ -	$ 3,198,480
2089	$ -	$ 59,935,220	$ 59,935,220	$ -	$ -	$ 3,302,431	$ -	$ 3,302,431
2090	$ -	$ 61,883,115	$ 61,883,115	$ -	$ -	$ 3,409,760	$ -	$ 3,409,760
2091	$ -	$ 63,894,316	$ 63,894,316	$ -	$ -	$ 3,520,577	$ -	$ 3,520,577
2092	$ -	$ 65,970,881	$ 65,970,881	$ -	$ -	$ 3,634,996	$ -	$ 3,634,996
2093	$ -	$ 68,114,935	$ 68,114,935	$ -	$ -	$ 3,753,133	$ -	$ 3,753,133
2094	$ -	$ 70,328,670	$ 70,328,670	$ -	$ -	$ 3,875,110	$ -	$ 3,875,110
2095	$ -	$ 72,614,352	$ 72,614,352	$ -	$ -	$ 4,001,051	$ -	$ 4,001,051
2096	$ -	$ 74,974,318	$ 74,974,318	$ -	$ -	$ 4,131,085	$ -	$ 4,131,085
2097	$ -	$ 77,410,984	$ 77,410,984	$ -	$ -	$ 4,265,345	$ -	$ 4,265,345
2098	$ -	$ 79,926,841	$ 79,926,841	$ -	$ -	$ 4,403,969	$ -	$ 4,403,969
2099	$ -	$ 82,524,463	$ 82,524,463	$ -	$ -	$ 4,547,098	$ -	$ 4,547,098
2100	$ -	$ 85,206,508	$ 85,206,508	$ -	$ -	$ 4,694,879	$ -	$ 4,694,879
2101	$ -	$ 87,975,720	$ 87,975,720	$ -	$ -	$ 4,847,462	$ -	$ 4,847,462
2102	$ -	$ 90,834,931	$ 90,834,931	$ -	$ -	$ 5,005,005	$ -	$ 5,005,005
2103	$ -	$ 93,787,066	$ 93,787,066	$ -	$ -	$ 5,167,667	$ -	$ 5,167,667
2104	$ -	$ 96,835,145	$ 96,835,145	$ -	$ -	$ 5,335,617	$ -	$ 5,335,617
2105	$ -	$ 99,982,288	$ 99,982,288	$ -	$ -	$ 5,509,024	$ -	$ 5,509,024
2106	$ -	$ 103,231,712	$ 103,231,712	$ -	$ -	$ 5,688,067	$ -	$ 5,688,067
2107	$ -	$ 106,586,743	$ 106,586,743	$ -	$ -	$ 5,872,930	$ -	$ 5,872,930
2108	$ -	$ 110,050,812	$ 110,050,812	$ -	$ -	$ 6,063,800	$ -	$ 6,063,800
2109	$ -	$ 113,627,463	$ 113,627,463	$ -	$ -	$ 6,260,873	$ -	$ 6,260,873
2110	$ -	$ 117,320,356	$ 117,320,356	$ -	$ -	$ 6,464,352	$ -	$ 6,464,352
2111	$ -	$ 121,133,267	$ 121,133,267	$ -	$ -	$ 6,674,443	$ -	$ 6,674,443
2112	$ -	$ 125,070,098	$ 125,070,098	$ -	$ -	$ 6,891,362	$ -	$ 6,891,362
2113	$ -	$ 129,134,877	$ 129,134,877	$ -	$ -	$ 7,115,332	$ -	$ 7,115,332
2114	$ -	$ 133,331,760	$ 133,331,760	$ -	$ -	$ 7,346,580	$ -	$ 7,346,580
2115	$ -	$ 137,665,042	$ 137,665,042	$ -	$ -	$ 7,585,344	$ -	$ 7,585,344
2116	$ -	$ 142,139,156	$ 142,139,156	$ -	$ -	$ 7,831,868	$ -	$ 7,831,868
2117	$ -	$ 146,758,679	$ 146,758,679	$ -	$ -	$ 8,086,403	$ -	$ 8,086,403

** Contributions related to future employee payroll in excess of normal cost and expenses of 8.49% of pay.*

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

Fiscal Year Ending	Projected Beginning Plan 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	$ 20,100,579	$ 903,195	$ 1,527,853	$ 11,756	$ 1,484,109	$ 20,948,274
2019	$ 20,948,274	$ 884,536	$ 1,595,336	$ 11,090	$ 1,544,539	$ 21,770,923
2020	$ 21,770,923	$ 869,930	$ 1,663,215	$ 10,507	$ 1,603,222	$ 22,570,353
2021	$ 22,570,353	$ 859,810	$ 1,727,985	$ 10,016	$ 1,660,440	$ 23,352,602
2022	$ 23,352,602	$ 851,656	$ 1,796,466	$ 9,561	$ 1,716,303	$ 24,114,534
2023	$ 24,114,534	$ 844,984	$ 1,872,250	$ 9,130	$ 1,770,428	$ 24,848,566
2024	$ 24,848,566	$ 839,687	$ 1,948,808	$ 8,720	$ 1,822,482	$ 25,553,207
2025	$ 25,553,207	$ 835,903	$ 2,023,884	$ 8,335	$ 1,872,440	$ 26,229,331
2026	$ 26,229,331	$ 833,572	$ 2,094,880	$ 7,973	$ 1,920,462	$ 26,880,512
2027	$ 26,880,512	$ 832,503	$ 2,162,613	$ 7,629	$ 1,966,780	$ 27,509,553
2028	$ 27,509,553	$ 832,540	$ 2,228,224	$ 7,299	$ 2,011,556	$ 28,118,126
2029	$ 28,118,126	$ 833,641	$ 2,290,228	$ 6,982	$ 2,054,968	$ 28,709,525
2030	$ 28,709,525	$ 835,801	$ 2,348,693	$ 6,678	$ 2,097,261	$ 29,287,216
2031	$ 29,287,216	$ 838,934	$ 2,404,839	$ 6,384	$ 2,138,647	$ 29,853,574
2032	$ 29,853,574	$ 805,936	$ 2,458,415	$ 6,098	$ 2,177,946	$ 30,372,943
2033	$ 30,372,943	$ 810,679	$ 2,510,080	$ 5,816	$ 2,215,181	$ 30,882,907
2034	$ 30,882,907	$ 816,197	$ 2,559,556	$ 5,539	$ 2,251,820	$ 31,385,829
2035	$ 31,385,829	$ 822,588	$ 2,606,601	$ 5,268	$ 2,288,052	$ 31,884,600
2036	$ 31,884,600	$ 829,830	$ 2,651,781	$ 5,003	$ 2,324,073	$ 32,381,719
2037	$ 32,381,719	$ 837,831	$ 2,694,296	$ 4,741	$ 2,360,096	$ 32,880,609
2038	$ 32,880,609	$ 846,639	$ 2,732,643	$ 4,483	$ 2,396,434	$ 33,386,556
2039	$ 33,386,556	$ 856,225	$ 2,766,324	$ 4,228	$ 2,433,502	$ 33,905,731
2040	$ 33,905,731	$ 866,528	$ 2,797,101	$ 3,973	$ 2,471,696	$ 34,442,881
2041	$ 34,442,881	$ 877,501	$ 2,824,900	$ 3,717	$ 2,511,372	$ 35,003,137
2042	$ 35,003,137	$ 889,163	$ 2,850,440	$ 3,461	$ 2,552,890	$ 35,591,289
2043	$ 35,591,289	$ 901,689	$ 2,872,421	$ 3,207	$ 2,596,662	$ 36,214,012
2044	$ 36,214,012	$ 915,216	$ 2,890,666	$ 2,958	$ 2,643,202	$ 36,878,806
2045	$ 36,878,806	$ 929,720	$ 2,928,295	$ 2,713	$ 2,692,219	$ 37,569,737
2046	$ 37,569,737	$ 945,184	$ 2,982,023	$ 2,471	$ 2,742,639	$ 38,273,066
2047	$ 38,273,066	$ 961,706	$ 3,032,184	$ 2,234	$ 2,794,159	$ 38,994,513
2048	$ 38,994,513	$ 979,362	$ 3,078,438	$ 2,002	$ 2,847,223	$ 39,740,658
2049	$ 39,740,658	$ 998,273	$ 3,120,746	$ 1,778	$ 2,902,330	$ 40,518,737
2050	$ 40,518,737	$ 1,018,585	$ 3,156,647	$ 1,564	$ 2,960,120	$ 41,339,231
2051	$ 41,339,231	$ 1,040,354	$ 3,187,338	$ 1,362	$ 3,021,336	$ 42,212,221
2052	$ 42,212,221	$ 1,063,662	$ 3,212,869	$ 1,171	$ 3,086,735	$ 43,148,578
2053	$ 43,148,578	$ 1,088,602	$ 3,232,287	$ 993	$ 3,157,172	$ 44,161,072
2054	$ 44,161,072	$ 1,115,275	$ 3,244,431	$ 831	$ 3,233,650	$ 45,264,735
2055	$ 45,264,735	$ 1,143,820	$ 3,248,944	$ 685	$ 3,317,315	$ 46,476,241
2056	$ 46,476,241	$ 1,174,217	$ 3,245,847	$ 556	$ 3,409,416	$ 47,813,471
2057	$ 47,813,471	$ 1,206,471	$ 3,235,093	$ 442	$ 3,511,296	$ 49,295,703
2058	$ 49,295,703	$ 1,240,672	$ 3,215,835	$ 344	$ 3,624,436	$ 50,944,632
2059	$ 50,944,632	$ 1,276,848	$ 3,187,379	$ 262	$ 3,750,488	$ 52,784,327
2060	$ 52,784,327	$ 1,314,975	$ 3,149,600	$ 196	$ 3,891,263	$ 54,840,769
2061	$ 54,840,769	$ 1,355,038	$ 3,102,138	$ 142	$ 4,048,721	$ 57,142,248
2062	$ 57,142,248	$ 1,396,987	$ 3,046,046	$ 100	$ 4,224,944	$ 59,718,033
2063	$ 59,718,033	$ 1,440,775	$ 2,982,999	$ 67	$ 4,422,063	$ 62,597,805
2064	$ 62,597,805	$ 1,486,404	$ 2,913,721	$ 42	$ 4,642,277	$ 65,812,723
2065	$ 65,812,723	$ 1,533,870	$ 2,838,696	$ 25	$ 4,887,907	$ 69,395,779
2066	$ 69,395,779	$ 1,583,188	$ 2,758,782	$ 14	$ 5,161,396	$ 73,381,567
2067	$ 73,381,567	$ 1,634,327	$ 2,675,015	$ 7	$ 5,465,297	$ 77,806,169

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

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

Fiscal Year Ending	Projected Beginning Plan Net 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	$ 77,806,169	$ 1,687,256	$ 2,588,175	$ 3	$ 5,802,289	$ 82,707,536
2069	$ 82,707,536	$ 1,741,991	$ 2,498,609	$ 1	$ 6,175,205	$ 88,126,122
2070	$ 88,126,122	$ 1,798,566	$ 2,406,545	$ -	$ 6,587,073	$ 94,105,216
2071	$ 94,105,216	$ 1,857,008	$ 2,312,304	$ -	$ 7,041,127	$ 100,691,047
2072	$ 100,691,047	$ 1,917,357	$ 2,216,116	$ -	$ 7,540,828	$ 107,933,116
2073	$ 107,933,116	$ 1,979,670	$ 2,118,119	$ -	$ 8,089,886	$ 115,884,553
2074	$ 115,884,553	$ 2,044,009	$ 2,018,467	$ -	$ 8,692,282	$ 124,602,377
2075	$ 124,602,377	$ 2,110,439	$ 1,917,341	$ -	$ 9,352,289	$ 134,147,764
2076	$ 134,147,764	$ 2,179,029	$ 1,814,966	$ -	$ 10,074,488	$ 144,586,315
2077	$ 144,586,315	$ 2,249,847	$ 1,711,615	$ -	$ 10,863,793	$ 155,988,340
2078	$ 155,988,340	$ 2,322,967	$ 1,607,613	$ -	$ 11,725,467	$ 168,429,161
2079	$ 168,429,161	$ 2,398,463	$ 1,503,340	$ -	$ 12,665,148	$ 181,989,432
2080	$ 181,989,432	$ 2,476,413	$ 1,399,233	$ -	$ 13,688,872	$ 196,755,484
2081	$ 196,755,484	$ 2,556,897	$ 1,295,779	$ -	$ 14,803,098	$ 212,819,700
2082	$ 212,819,700	$ 2,639,996	$ 1,193,503	$ -	$ 16,014,741	$ 230,280,934
2083	$ 230,280,934	$ 2,725,796	$ 1,092,959	$ -	$ 17,331,195	$ 249,244,966
2084	$ 249,244,966	$ 2,814,384	$ 994,718	$ -	$ 18,760,376	$ 269,825,008
2085	$ 269,825,008	$ 2,905,852	$ 899,354	$ -	$ 20,310,759	$ 292,142,265
2086	$ 292,142,265	$ 3,000,292	$ 807,434	$ -	$ 21,991,416	$ 316,326,539
2087	$ 316,326,539	$ 3,097,801	$ 719,492	$ -	$ 23,812,065	$ 342,516,913
2088	$ 342,516,913	$ 3,198,480	$ 636,019	$ -	$ 25,783,124	$ 370,862,498
2089	$ 370,862,498	$ 3,302,431	$ 557,448	$ -	$ 27,915,763	$ 401,523,244
2090	$ 401,523,244	$ 3,409,760	$ 484,150	$ -	$ 30,221,970	$ 434,670,824
2091	$ 434,670,824	$ 3,520,577	$ 416,424	$ -	$ 32,714,613	$ 470,489,590
2092	$ 470,489,590	$ 3,634,996	$ 354,488	$ -	$ 35,407,514	$ 509,177,612
2093	$ 509,177,612	$ 3,753,133	$ 298,469	$ -	$ 38,315,529	$ 550,947,805
2094	$ 550,947,805	$ 3,875,110	$ 248,395	$ -	$ 41,454,629	$ 596,029,149
2095	$ 596,029,149	$ 4,001,051	$ 204,191	$ -	$ 44,841,994	$ 644,668,003
2096	$ 644,668,003	$ 4,131,085	$ 165,685	$ -	$ 48,496,115	$ 697,129,518
2097	$ 697,129,518	$ 4,265,345	$ 132,610	$ -	$ 52,436,890	$ 753,699,143
2098	$ 753,699,143	$ 4,403,969	$ 104,619	$ -	$ 56,685,747	$ 814,684,240
2099	$ 814,684,240	$ 4,547,098	$ 81,299	$ -	$ 61,265,758	$ 880,415,797
2100	$ 880,415,797	$ 4,694,879	$ 62,185	$ -	$ 66,201,770	$ 951,250,261
2101	$ 951,250,261	$ 4,847,462	$ 46,786	$ -	$ 71,520,541	$ 1,027,571,478
2102	$ 1,027,571,478	$ 5,005,005	$ 34,602	$ -	$ 77,250,881	$ 1,109,792,762
2103	$ 1,109,792,762	$ 5,167,667	$ 25,143	$ -	$ 83,423,816	$ 1,198,359,102
2104	$ 1,198,359,102	$ 5,335,617	$ 17,941	$ -	$ 90,072,741	$ 1,293,749,519
2105	$ 1,293,749,519	$ 5,509,024	$ 12,567	$ -	$ 97,233,605	$ 1,396,479,581
2106	$ 1,396,479,581	$ 5,688,067	$ 8,640	$ -	$ 104,945,097	$ 1,507,104,105
2107	$ 1,507,104,105	$ 5,872,930	$ 5,833	$ -	$ 113,248,846	$ 1,626,220,048
2108	$ 1,626,220,048	$ 6,063,800	$ 3,869	$ -	$ 122,189,643	$ 1,754,469,622
2109	$ 1,754,469,622	$ 6,260,873	$ 2,524	$ -	$ 131,815,667	$ 1,892,543,638
2110	$ 1,892,543,638	$ 6,464,352	$ 1,623	$ -	$ 142,178,744	$ 2,041,185,111
2111	$ 2,041,185,111	$ 6,674,443	$ 1,032	$ -	$ 153,334,612	$ 2,201,193,134
2112	$ 2,201,193,134	$ 6,891,362	$ 651	$ -	$ 165,343,215	$ 2,373,427,060
2113	$ 2,373,427,060	$ 7,115,332	$ 410	$ -	$ 178,269,016	$ 2,558,810,998
2114	$ 2,558,810,998	$ 7,346,580	$ 259	$ -	$ 192,181,331	$ 2,758,338,650
2115	$ 2,758,338,650	$ 7,585,344	$ 166	$ -	$ 207,154,701	$ 2,973,078,529
2116	$ 2,973,078,529	$ 7,831,868	$ 108	$ -	$ 223,269,271	$ 3,204,179,560
2117	$ 3,204,179,560	$ 8,086,403	$ 85	$ -	$ 240,611,222	$ 3,452,877,100

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 Benefit Payments (Dollars in Thousands)

Fiscal Year Ending	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
2018	$ 20,100,579	$ 1,527,853	$ 1,527,853	$ -	$ 1,473,592	$ -	$ 1,473,592
2019	$ 20,948,276	$ 1,595,336	$ 1,595,336	$ -	$ 1,431,329	$ -	$ 1,431,329
2020	$ 21,770,925	$ 1,663,215	$ 1,663,215	$ -	$ 1,388,120	$ -	$ 1,388,120
2021	$ 22,570,356	$ 1,727,985	$ 1,727,985	$ -	$ 1,341,561	$ -	$ 1,341,561
2022	$ 23,352,605	$ 1,796,466	$ 1,796,466	$ -	$ 1,297,421	$ -	$ 1,297,421
2023	$ 24,114,538	$ 1,872,250	$ 1,872,250	$ -	$ 1,257,816	$ -	$ 1,257,816
2024	$ 24,848,570	$ 1,948,808	$ 1,948,808	$ -	$ 1,217,907	$ -	$ 1,217,907
2025	$ 25,553,211	$ 2,023,884	$ 2,023,884	$ -	$ 1,176,582	$ -	$ 1,176,582
2026	$ 26,229,334	$ 2,094,880	$ 2,094,880	$ -	$ 1,132,888	$ -	$ 1,132,888
2027	$ 26,880,516	$ 2,162,613	$ 2,162,613	$ -	$ 1,087,924	$ -	$ 1,087,924
2028	$ 27,509,557	$ 2,228,224	$ 2,228,224	$ -	$ 1,042,726	$ -	$ 1,042,726
2029	$ 28,118,130	$ 2,290,228	$ 2,290,228	$ -	$ 996,969	$ -	$ 996,969
2030	$ 28,709,529	$ 2,348,693	$ 2,348,693	$ -	$ 951,087	$ -	$ 951,087
2031	$ 29,287,220	$ 2,404,839	$ 2,404,839	$ -	$ 905,882	$ -	$ 905,882
2032	$ 29,853,577	$ 2,458,415	$ 2,458,415	$ -	$ 861,455	$ -	$ 861,455
2033	$ 30,372,946	$ 2,510,080	$ 2,510,080	$ -	$ 818,194	$ -	$ 818,194
2034	$ 30,882,911	$ 2,559,556	$ 2,559,556	$ -	$ 776,113	$ -	$ 776,113
2035	$ 31,385,833	$ 2,606,601	$ 2,606,601	$ -	$ 735,235	$ -	$ 735,235
2036	$ 31,884,605	$ 2,651,781	$ 2,651,781	$ -	$ 695,795	$ -	$ 695,795
2037	$ 32,381,724	$ 2,694,296	$ 2,694,296	$ -	$ 657,628	$ -	$ 657,628
2038	$ 32,880,613	$ 2,732,643	$ 2,732,643	$ -	$ 620,454	$ -	$ 620,454
2039	$ 33,386,559	$ 2,766,324	$ 2,766,324	$ -	$ 584,280	$ -	$ 584,280
2040	$ 33,905,735	$ 2,797,101	$ 2,797,101	$ -	$ 549,563	$ -	$ 549,563
2041	$ 34,442,884	$ 2,824,900	$ 2,824,900	$ -	$ 516,302	$ -	$ 516,302
2042	$ 35,003,140	$ 2,850,440	$ 2,850,440	$ -	$ 484,624	$ -	$ 484,624
2043	$ 35,591,292	$ 2,872,421	$ 2,872,421	$ -	$ 454,289	$ -	$ 454,289
2044	$ 36,214,015	$ 2,890,666	$ 2,890,666	$ -	$ 425,279	$ -	$ 425,279
2045	$ 36,878,809	$ 2,928,295	$ 2,928,295	$ -	$ 400,758	$ -	$ 400,758
2046	$ 37,569,740	$ 2,982,023	$ 2,982,023	$ -	$ 379,638	$ -	$ 379,638
2047	$ 38,273,069	$ 3,032,184	$ 3,032,184	$ -	$ 359,092	$ -	$ 359,092
2048	$ 38,994,516	$ 3,078,438	$ 3,078,438	$ -	$ 339,135	$ -	$ 339,135
2049	$ 39,740,661	$ 3,120,746	$ 3,120,746	$ -	$ 319,810	$ -	$ 319,810
2050	$ 40,518,739	$ 3,156,647	$ 3,156,647	$ -	$ 300,920	$ -	$ 300,920
2051	$ 41,339,234	$ 3,187,338	$ 3,187,338	$ -	$ 282,647	$ -	$ 282,647
2052	$ 42,212,224	$ 3,212,869	$ 3,212,869	$ -	$ 265,034	$ -	$ 265,034
2053	$ 43,148,582	$ 3,232,287	$ 3,232,287	$ -	$ 248,033	$ -	$ 248,033
2054	$ 44,161,076	$ 3,244,431	$ 3,244,431	$ -	$ 231,595	$ -	$ 231,595
2055	$ 45,264,740	$ 3,248,944	$ 3,248,944	$ -	$ 215,737	$ -	$ 215,737
2056	$ 46,476,245	$ 3,245,847	$ 3,245,847	$ -	$ 200,494	$ -	$ 200,494
2057	$ 47,813,476	$ 3,235,093	$ 3,235,093	$ -	$ 185,888	$ -	$ 185,888
2058	$ 49,295,708	$ 3,215,835	$ 3,215,835	$ -	$ 171,890	$ -	$ 171,890
2059	$ 50,944,638	$ 3,187,379	$ 3,187,379	$ -	$ 158,483	$ -	$ 158,483
2060	$ 52,784,332	$ 3,149,600	$ 3,149,600	$ -	$ 145,679	$ -	$ 145,679
2061	$ 54,840,775	$ 3,102,138	$ 3,102,138	$ -	$ 133,473	$ -	$ 133,473
2062	$ 57,142,254	$ 3,046,046	$ 3,046,046	$ -	$ 121,916	$ -	$ 121,916
2063	$ 59,718,038	$ 2,982,999	$ 2,982,999	$ -	$ 111,063	$ -	$ 111,063
2064	$ 62,597,810	$ 2,913,721	$ 2,913,721	$ -	$ 100,915	$ -	$ 100,915
2065	$ 65,812,728	$ 2,838,696	$ 2,838,696	$ -	$ 91,457	$ -	$ 91,457
2066	$ 69,395,784	$ 2,758,782	$ 2,758,782	$ -	$ 82,681	$ -	$ 82,681
2067	$ 73,381,572	$ 2,675,015	$ 2,675,015	$ -	$ 74,577	$ -	$ 74,577

Single Discount Rate Development
Present Values of Projected Benefit Payments
(Dollars in Thousands) (Concluded)

Fiscal Year Ending	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
2068	$ 77,806,175	$ 2,588,175	$ 2,588,175	$ -	$ 67,122	$ -	$ 67,122
2069	$ 82,707,542	$ 2,498,609	$ 2,498,609	$ -	$ 60,278	$ -	$ 60,278
2070	$ 88,126,128	$ 2,406,545	$ 2,406,545	$ -	$ 54,007	$ -	$ 54,007
2071	$ 94,105,221	$ 2,312,304	$ 2,312,304	$ -	$ 48,272	$ -	$ 48,272
2072	$ 100,691,051	$ 2,216,116	$ 2,216,116	$ -	$ 43,036	$ -	$ 43,036
2073	$ 107,933,120	$ 2,118,119	$ 2,118,119	$ -	$ 38,263	$ -	$ 38,263
2074	$ 115,884,557	$ 2,018,467	$ 2,018,467	$ -	$ 33,919	$ -	$ 33,919
2075	$ 124,602,381	$ 1,917,341	$ 1,917,341	$ -	$ 29,972	$ -	$ 29,972
2076	$ 134,147,768	$ 1,814,966	$ 1,814,966	$ -	$ 26,392	$ -	$ 26,392
2077	$ 144,586,318	$ 1,711,615	$ 1,711,615	$ -	$ 23,153	$ -	$ 23,153
2078	$ 155,988,343	$ 1,607,613	$ 1,607,613	$ -	$ 20,229	$ -	$ 20,229
2079	$ 168,429,163	$ 1,503,340	$ 1,503,340	$ -	$ 17,597	$ -	$ 17,597
2080	$ 181,989,434	$ 1,399,233	$ 1,399,233	$ -	$ 15,236	$ -	$ 15,236
2081	$ 196,755,486	$ 1,295,779	$ 1,295,779	$ -	$ 13,125	$ -	$ 13,125
2082	$ 212,819,702	$ 1,193,503	$ 1,193,503	$ -	$ 11,245	$ -	$ 11,245
2083	$ 230,280,935	$ 1,092,959	$ 1,092,959	$ -	$ 9,580	$ -	$ 9,580
2084	$ 249,244,967	$ 994,718	$ 994,718	$ -	$ 8,110	$ -	$ 8,110
2085	$ 269,825,010	$ 899,354	$ 899,354	$ -	$ 6,821	$ -	$ 6,821
2086	$ 292,142,267	$ 807,434	$ 807,434	$ -	$ 5,697	$ -	$ 5,697
2087	$ 316,326,541	$ 719,492	$ 719,492	$ -	$ 4,722	$ -	$ 4,722
2088	$ 342,516,915	$ 636,019	$ 636,019	$ -	$ 3,883	$ -	$ 3,883
2089	$ 370,862,499	$ 557,448	$ 557,448	$ -	$ 3,166	$ -	$ 3,166
2090	$ 401,523,245	$ 484,150	$ 484,150	$ -	$ 2,558	$ -	$ 2,558
2091	$ 434,670,825	$ 416,424	$ 416,424	$ -	$ 2,047	$ -	$ 2,047
2092	$ 470,489,592	$ 354,488	$ 354,488	$ -	$ 1,621	$ -	$ 1,621
2093	$ 509,177,613	$ 298,469	$ 298,469	$ -	$ 1,269	$ -	$ 1,269
2094	$ 550,947,806	$ 248,395	$ 248,395	$ -	$ 983	$ -	$ 983
2095	$ 596,029,150	$ 204,191	$ 204,191	$ -	$ 751	$ -	$ 751
2096	$ 644,668,004	$ 165,685	$ 165,685	$ -	$ 567	$ -	$ 567
2097	$ 697,129,519	$ 132,610	$ 132,610	$ -	$ 422	$ -	$ 422
2098	$ 753,699,144	$ 104,619	$ 104,619	$ -	$ 310	$ -	$ 310
2099	$ 814,684,241	$ 81,299	$ 81,299	$ -	$ 224	$ -	$ 224
2100	$ 880,415,798	$ 62,185	$ 62,185	$ -	$ 159	$ -	$ 159
2101	$ 951,250,262	$ 46,786	$ 46,786	$ -	$ 112	$ -	$ 112
2102	$ 1,027,571,479	$ 34,602	$ 34,602	$ -	$ 77	$ -	$ 77
2103	$ 1,109,792,763	$ 25,143	$ 25,143	$ -	$ 52	$ -	$ 52
2104	$ 1,198,359,103	$ 17,941	$ 17,941	$ -	$ 34	$ -	$ 34
2105	$ 1,293,749,519	$ 12,567	$ 12,567	$ -	$ 22	$ -	$ 22
2106	$ 1,396,479,581	$ 8,640	$ 8,640	$ -	$ 14	$ -	$ 14
2107	$ 1,507,104,104	$ 5,833	$ 5,833	$ -	$ 9	$ -	$ 9
2108	$ 1,626,220,048	$ 3,869	$ 3,869	$ -	$ 6	$ -	$ 6
2109	$ 1,754,469,622	$ 2,524	$ 2,524	$ -	$ 3	$ -	$ 3
2110	$ 1,892,543,638	$ 1,623	$ 1,623	$ -	$ 2	$ -	$ 2
2111	$ 2,041,185,110	$ 1,032	$ 1,032	$ -	$ 1	$ -	$ 1
2112	$ 2,201,193,133	$ 651	$ 651	$ -	$ 1	$ -	$ 1
2113	$ 2,373,427,059	$ 410	$ 410	$ -	$ -	$ -	$ -
2114	$ 2,558,810,996	$ 259	$ 259	$ -	$ -	$ -	$ -
2115	$ 2,758,338,649	$ 166	$ 166	$ -	$ -	$ -	$ -
2116	$ 2,973,078,527	$ 108	$ 108	$ -	$ -	$ -	$ -
2117	$ 3,204,179,557	$ 85	$ 85	$ -	$ -	$ -	$ -
				Totals	$ 30,356,999	$ -	$ 30,356,999

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 payments at predetermined rates of interest and 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.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)	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	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	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.

Glossary of Terms

Entry Age Actuarial Cost Method (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.
GASB	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
Fiduciary Net Position	The fiduciary net position is the value of the assets of the trust.
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 contribution entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contribution Entities	Non-employer contribution 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 Statement plan members are not considered non-employer contribution entities.
Normal Cost	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.

Glossary of Terms

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.
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 Benefit Changes 4. Employee Contributions (made negative for addition here) 5. Projected Earnings on Plan Investments (made negative for addition here) 6. Pension Plan Administrative Expense 7. Other Changes in Plan Fiduciary Net Position 8. Recognition of Outflow (Inflow) of Resources due to Liabilities 9. Recognition of Outflow (Inflow) of Resources due to Assets
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 assets used in determining the unfunded liability of the plan. For purposes of the GASB Statement No. 67, the valuation asset is equal to the market value of assets.

Public Employees Retirement Association of Minnesota

Local Government Correctional Service Retirement Plan

GASB Statements No. 67 and No. 68 Accounting and Financial Reporting for Pensions

June 30, 2017

GRS Retirement Consulting
P: 800.521.0498 | F: 763.432.5842 | www.grsconsulting.com

November 10, 2017

Public Employees Retirement Association of Minnesota
Local Government Correctional Service Retirement Plan
St. Paul, Minnesota

Dear Trustees of the Local Government Correctional Service Retirement Plan:

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 Local Government Correctional Service Retirement Plan ("LGCSRP"), 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 reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. The calculation of the plan's liability for this report may not be applicable for purposes of funding the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 and No. 68 may produce significantly different results. The information in this report is calculated on a total plan basis. PERA is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer. This report may be provided to parties other than the Public Employees Retirement Association (PERA) only in its entirety and only with the permission of PERA. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by PERA, 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 data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Local Government Correctional Service Retirement Plan 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

Table of Contents

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
Employer's Fiscal Year Ending Date (Reporting Date)	Varies by Employer
Membership	
Number of	
- Service Retirements	853
- Survivors	54
- Disability Retirements	178
- Deferred Retirements	2,933
- Terminated other non-vested	2,624
- Active Members	3,842
- Total	10,484
Covered Payroll	$ 200,103
Net Pension Liability	
Total Pension Liability	$ 887,461
Plan Fiduciary Net Position	602,460
Net Pension Liability	$ 285,001
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.89%
Net Pension Liability as a Percentage of Covered Payroll	142.43%
Development of the Single Discount Rate	
Single Discount Rate	5.96%
Long-Term Expected Rate of Investment Return	7.50%
Long-Term Municipal Bond Rate*	3.56%
Last year ending June 30 in the 2018 to 2117 projection period for which projected benefit payments are fully funded	2061
Total Pension Expense/ (Income)	**$ 90,095**

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

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	$ 190	$ 4,609
Changes in assumptions	$ 155,166	$ 49,610
Net difference between projected and actual earnings on pension plan investments	$ 29,977	$ 39,694
Total	$ 185,333	$ 93,913

* *Source:* *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. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*

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. Governmental Accounting Standards Board (GASB) Statement No. 82, Pension Issues, is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

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

Financial Statements

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

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

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.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to 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.

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 remain approximately level as a percentage of payroll.
2. The unfunded actuarial accrued liabilities will increase and not be eliminated.
3. The funded status of the plan will decrease.
4. The plan may eventually become insolvent and unable to pay benefits.

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.

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 the weekly rate closest to but not later than the measurement date of Fidelity's "20-Year Municipal GO AA Index"); and the resulting single discount rate is 5.96%. 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	$	49,202
2.	Interest on the Total Pension Liability	$	47,336
3.	Current-Period Benefit Changes	$	-
4.	Employee Contributions (made negative for addition here)	$	(11,666)
5.	Projected Earnings on Plan Investments (made negative for addition here)	$	(38,695)
6.	Pension Plan Administrative Expense	$	330
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	$	(879)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period	$	(16,537)
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	$	(7,934)
11.	**Increase/(Decrease) from Experience in the Current Reporting Period**	**$**	**21,157**
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	$	(3,209)
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods	$	69,041
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	$	3,106
15.	**Total Pension Expense / (Income)**	**$**	**90,095**

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	$	(3,516)
2. Assumption Changes (gains) or losses	$	(66,147)
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		4.0000
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	$	(879)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	(16,537)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(17,416)
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	$	(2,637)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	(49,610)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(52,247)
B. Outflows (Inflows) of Resources due to Assets		
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(39,668)
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	$	(7,934)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(31,734)

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 of Resources
1. Due to Liabilities	$ 77,679	$ 29,263	$ 48,416
2. Due to Assets	$ 11,067	$ 15,895	$ (4,828)
3. Total	$ 88,746	$ 45,158	$ 43,588

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ 96	$ 4,184	$ (4,088)
2. Assumption Changes	$ 77,583	$ 25,079	$ 52,504
3. Net Difference between projected and actual earnings on pension plan investments	$ 11,067	$ 15,895	$ (4,828)
4. Total	$ 88,746	$ 45,158	$ 43,588

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 of Resources
1. Differences between expected and actual experience	$ 190	$ 4,609	$ (4,419)
2. Assumption Changes	$ 155,166	$ 49,610	$ 105,556
3. Net Difference between projected and actual earnings on pension plan investments	$ 29,977	$ 39,694	$ (9,717)
4. Total	$ 185,333	$ 93,913	$ 91,420

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2018	$ 53,464
2019	$ 63,395
2020	$ (17,506)
2021	$ (7,933)
2022	$ -
Thereafter	$ -
Total	$ 91,420

Statement of Fiduciary Net Position
(Dollars in Thousands)

	Market Value	
Assets in Trust	**June 30, 2017**	**June 30, 2016**
Cash, equivalents, short term securities	$ 15,461	$ 11,243
Fixed income	$ 116,764	$ 125,331
Equity	$ 390,993	$ 306,438
SBI Alternative	$ 79,019	$ 64,984
Other	$ -	$ -
Total Assets in Trust	**$ 602,237**	**$ 507,996**
Assets Receivable	$ 718	$ 234
Amounts Payable	$ (495)	$ (447)
Net Position Restricted for Pensions	**$ 602,460**	**$ 507,783**

Statement of Changes in Fiduciary Net Position
(Dollars in Thousands)

Change in Assets	Market Value	
Year Ending	**June 30, 2017**	**June 30, 2016**
1. Fund balance at market value at beginning of year	$ 507,783	$ 490,731
2. Adjustment to match beginning of year asset statement	$ -	$ -
3. Fund balance at market value at beginning of year	$ 507,783	$ 490,731
4. Contributions		
a. Member	$ 11,666	$ 11,008
b. Employer	$ 17,489	$ 16,490
c. Other sources	$ -	$ -
d. Total contributions	$ 29,155	$ 27,498
5. Investment income		
a. Investment income/(loss)	$ 78,973	$ 870
b. Investment expenses	$ (610)	$ (661)
c. Net subtotal	$ 78,363	$ 209
6. Other	$ -	$ (2)
7. Total additions: *(4.d.) + (5.c.) + (6.)*	**$ 107,518**	**$ 27,705**
8. Benefits Paid		
a. Annuity benefits	$ (11,033)	$ (9,381)
b. Refunds	$ (1,478)	$ (982)
c. Total benefits paid	$ (12,511)	$ (10,363)
9. Expenses		
a. Other	$ -	$ -
b. Administrative	$ (330)	$ (290)
c. Total expenses	$ (330)	$ (290)
10. Total deductions: *(8.c.) + (9.c.)*	**$ (12,841)**	**$ (10,653)**
11. Net increase (decrease) in net position: *(7.) + (10.)*	$ 94,677	$ 17,052
12. Net position restricted for pensions	**$ 602,460**	**$ 507,783**
13. Approximate return on market value of assets	15.1%	0.0%

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	$	49,202
2. Interest on the Total Pension Liability	$	47,336
3. Changes of benefit terms	$	-
4. Difference between expected and actual experience of the Total Pension Liability	$	(3,516)
5. Changes of assumptions	$	(66,147)
6. Benefit payments, including refunds of employee contributions	$	(12,511)
7. Net change in total pension liability	$	14,364
8. Total pension liability – beginning	$	873,097
9. Total pension liability – ending	**$**	**887,461**
B. Plan fiduciary net position		
1. Contributions – employer	$	17,489
2. Contributions – employee	$	11,666
3. Net investment income	$	78,363
4. Benefit payments, including refunds of employee contributions	$	(12,511)
5. Pension Plan Administrative Expense	$	(330)
6. Other	$	-
7. Net change in plan fiduciary net position	$	94,677
8. Plan fiduciary net position – beginning	$	507,783
9. Plan fiduciary net position – ending	**$**	**602,460**
C. Net pension liability	**$**	**285,001**
D. Plan fiduciary net position as a percentage of the total pension liability		**67.89%**
E. Covered-employee payroll*	**$**	**200,103**
F. Net pension liability as a percentage of covered employee payroll		**142.43%**

** Assumed equal to actual member contributions divided by employee 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 may be built prospectively)

Fiscal year ending June 30,	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total Pension Liability										
Service Cost	$ 49,202	$ 25,950	$ 25,098	$ 26,488						
Interest on the Total Pension Liability	$ 47,336	$ 40,605	$ 37,043	33,955						
Benefit Changes	$ -	$ -	$ -	0						
Experience	$ (3,516)	$ 382	$ (7,892)	(5,327)						
Assumption Changes	$ (66,147)	$ 310,332	$ -	(34,168)						
Benefit Payments	$ (11,033)	$ (9,381)	$ (7,777)	(6,711)						
Refunds	$ (1,478)	$ (982)	$ (1,057)	(1,105)						
Net Change in Total Pension Liability	$ 14,364	$ 366,906	$ 45,415	13,132						
Total Pension Liability - Beginning	$ 873,097	$ 506,191	$ 460,776	447,644						
Total Pension Liability - Ending (a)	$ 887,461	$ 873,097	$ 506,191	$ 460,776						
Plan Fiduciary Net Position										
Employer Contributions	$ 17,489	$ 16,490	$ 15,736	$ 15,054						
Employee Contributions	$ 11,666	$ 11,008	$ 10,472	10,030						
Pension Plan Net Investment Income	$ 78,363	$ 209	$ 20,373	69,451						
Benefit Payments	$ (11,033)	$ (9,381)	$ (7,777)	(6,711)						
Refunds	$ (1,478)	$ (982)	$ (1,057)	(1,105)						
Pension Plan Administrative Expense	$ (330)	$ (290)	$ (247)	(236)						
Other	$ -	$ (2)	$ (1)	(1)						
Net Change in Plan Fiduciary Net Position	$ 94,677	$ 17,052	$ 37,499	86,482						
Plan Fiduciary Net Position - Beginning	$ 507,783	$ 490,731	$ 453,232	366,750						
Plan Fiduciary Net Position - Ending (b)	$ 602,460	$ 507,783	$ 490,731	$ 453,232						
Net Pension Liability - Ending (a) - (b)	$ 285,001	$ 365,314	$ 15,460	7,544						
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.89 %	58.16 %	96.95 %	98.36 %						
Covered Employee Payroll	$ 200,103	$ 188,816	$ 179,623	$ 172,041						
Net Pension Liability as a Percentage of Covered Employee Payroll	142.43 %	193.48 %	8.61 %	4.39 %						

Notes to Schedule:

N/A

Schedules of Required Supplementary Information
Schedule of Net Pension Liability Multiyear
(Dollars in Thousands)

Last 10 Fiscal Years (which may be built prospectively)

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 460,776	$ 453,232	$ 7,544	98.36%	$ 172,041	4.39%
2015	$ 506,191	$ 490,731	$ 15,460	96.95%	$ 179,623	8.61%
2016	$ 873,097	$ 507,783	$ 365,314	58.16%	$ 188,816	193.48%
2017	$ 887,461	$ 602,460	$ 285,001	67.89%	$ 200,103	142.43%

Schedule of Contributions Multiyear (Dollars in Thousands)

Last 10 Fiscal Years

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2008	$ 10,153	$ 13,388	$ (3,235)	$ 154,202	8.68%
2009	$ 11,469	$ 14,124	$ (2,655)	$ 154,650	9.13
2010	$ 12,273	$ 14,170	$ (1,897)	$ 154,777	9.16
2011	$ 12,183	$ 14,289	$ (2,106)	$ 165,077	8.66
2012	$ 12,473	$ 14,320	$ (1,847)	$ 164,340	8.71
2013	$ 14,207	$ 14,498	$ (291)	$ 164,820	8.80
2014	$ 14,606	$ 15,054	$ (448)	$ 172,041	8.75
2015	$ 13,759	$ 15,736	$ (1,977)	$ 179,623	8.76
2016	$ 16,446	$ 16,490	$ (44)	$ 188,816	8.73
2017	$ 17,269	$ 17,489	$ (220)	$ 200,103	8.74

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Contribution Rates for Fiscal Year Ending June 30, 2017:

Valuation Date:	June 30
Notes	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.
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	15 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Payroll Growth	3.50%
Salary Increases	3.75% to 8.75% including inflation
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 2006 - 2011, prepared by a former actuary.
Mortality	RP-2000 annuitant generational mortality table, projected with scale AA, white collar adjustment.

Other Information:

Notes	The plan is assumed to pay a 2.50% post-retirement benefit increase for all years. See separate funding report as of July 1, 2016 for additional detail.

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

FY Ending June 30,	Annual Return[1]
2008	
2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	

[1] *Annual money-weighted rate of return, net of investment expenses.*

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

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 a geometric, long-term expected rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each major asset class that is included in the pension fund's target asset allocation as of June 30, 2017, these best estimates are summarized in the following table:

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 PERA for GASB compliance purposes. PERA 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.

Single Discount Rate

A single discount rate of 5.96% 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% and the municipal bond rate of 3.56%. The projection of cash flows used to determine this single discount rate assumed that plan member and employer contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments through the year ending June 30, 2061. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year ending June 30, 2061, and the municipal bond rate was applied to all benefit payments after the point of asset depletion.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 5.96%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is
1-percentage-point lower or 1-percentage-point higher:

Sensitivity of Net Pension Liability
to the Single Discount Rate Assumption

(Dollars in Thousands)

	1% Decrease 4.96%	Current Single Discount Rate Assumption 5.96%	1% Increase 6.96%
Total Pension Liability	$ 1,072,106	$ 887,461	$ 743,343
Net Position Restricted for Pensions	$ 602,460	$ 602,460	$ 602,460
Net Pension Liability	**$ 469,646**	**$ 285,001**	**$ 140,883**

GASB Statement No. 68 Reconciliation (Dollars in Thousands)
Current Reporting Period

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Current Period Deferred Outflows	Deferred Inflows	Pension Expense*
Balance Beginning of Year	**$ 873,097**	**$ 507,783**	**$ 365,314**			
Changes for the Year:						
Service Cost	$ 49,202		$ 49,202			$ 49,202
Interest on Total Pension Liability	47,336		47,336			47,336
Interest on Fiduciary Net Position		$ 38,695	(38,695)			(38,695)
Changes in Benefit Terms						
Liability Experience Gains and Losses	(3,516)		(3,516)	$ -	$ 2,637	(879)
Changes in Assumptions	(66,147)		(66,147)	-	49,610	(16,537)
Contributions - Employer		17,489	(17,489)			
Contributions - Employees		11,666	(11,666)			(11,666)
Asset Gain/(Loss)		39,668	(39,668)	-	31,734	(7,934)
Benefit Payouts	(12,511)	(12,511)				
Administrative Expenses		(330)	330			330
Other		-	-			-
Net Changes	**$ 14,364**	**$ 94,677**	**$ (80,313)**	**$ -**	**$ 83,981**	**$ 21,157**
Balance End of Year	**$ 887,461**	**$ 602,460**	**$ 285,001**			

** Pension Expense from Experience in the Current Reporting Period.*

GASB Statement No. 68 Reconciliation (Dollars in Thousands)
Current and Prior Reporting Periods

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Net Deferred Outflows Prior Year	Total Pension Expense*
Balance Beginning of Year	**$ 873,097**	**$ 507,783**	**$ 365,314**				
Changes for the Year:							
Service Cost	$ 49,202		$ 49,202				$ 49,202
Interest on Total Pension Liability	47,336		47,336				47,336
Interest on Fiduciary Net Position		$ 38,695	(38,695)				(38,695)
Changes in Benefit Terms							
Liability Experience Gains and Losses	(3,516)		(3,516)	$ 190	$ 4,609	$ (4,991)	(4,088)
Changes in Assumptions	(66,147)		(66,147)	155,166	49,610	224,207	52,504
Contributions - Employer		17,489	(17,489)				
Contributions - Employees		11,666	(11,666)				(11,666)
Asset Gain/(Loss)		39,668	(39,668)	29,977	39,694	25,123	(4,828)
Benefit Payouts	(12,511)	(12,511)					
Administrative Expenses		(330)	330				330
Other		-	-				-
Net Changes	**$ 14,364**	**$ 94,677**	**$ (80,313)**				**$ 90,095**
Balance End of Year	**$ 887,461**	**$ 602,460**	**$ 285,001**	**$ 185,333**	**$ 93,913**	**$ 244,339**	

** Pension Expense from Experience in the Current and Prior Reporting Periods.*

Summary of Population Statistics

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on July 1, 2016	**3,827**	**2,755**	**2,359**	**749**	**169**	**49**	**9,908**
New members	610						**610**
Return to active	30	(12)	(18)	0	0	0	**0**
Terminated non-vested	(330)	0	330	0	0	0	**0**
Service retirements	(70)	(45)	0	115	0	0	**0**
Terminated deferred	(159)	159	0	0	0	0	**0**
Terminated refund/transfer	(54)	(34)	(29)	0	0	0	**(117)**
Deaths	(5)	(6)	(2)	(9)	(3)	0	**(25)**
New beneficiary	0	0	0	0	0	4	**4**
Disabled	(7)	0	0	0	7	0	**0**
Data adjustments	0	116	(16)	(2)	5	1	**104**
Net change	15	178	265	104	9	5	**576**
Members on July 1, 2017	**3,842**	**2,933**	**2,624**	**853**	**178**	**54**	**10,484**

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. PERA 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	Local government employees in covered correctional service for a county administered jail or correctional facility or in a regional correctional facility administered by multiple counties, who are directly responsible for security, custody and control of persons confined in jail or facility, who are expected to respond to incidents within the jail or facility, and who are not members of the Public Employees Police and Fire Fund.
Contributions	Shown as a percent of salary: Member 5.83% Employer 8.75% Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
Allowable service	Local Government Correctional Service during which member contributions were made (effective July 1, 1999). May also include certain leaves of absence, military service and periods while temporary Worker's Compensation is paid.
Salary	Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage.
Average salary	Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years.
Vesting	Hired before July 1, 2010: 100% vested after 3 years of Allowable Service; Hired after June 30, 2010: 50% vested after 5 years of Allowable Service; 60% vested after 6 years of Allowable Service; 70% vested after 7 years of Allowable Service; 80% vested after 8 years of Allowable Service; 90% vested after 9 years of Allowable Service; and 100% vested after 10 years of Allowable Service.

Retirement

Normal retirement benefit

Age/service requirement	Age 55 and vested. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.
Amount	1.9% of Average Salary for each year of Allowable Service, pro rata for completed months.

Summary of Plan Provisions (Continued)

Retirement (Continued)

Early Retirement	
Age/service requirement	Age 50 and vested.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with actuarial reduction to commencement age assuming 3% augmentation to age 55 (2.50% if hired after June 30, 2006).
Form of payment	Life annuity. Actuarially equivalent options are: 25%, 50%, 75% or 100% Joint and Survivor. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan.
Benefit increases	Benefit recipients received a post-retirement benefit increase of 1.00% on January 1, 2013 and January 1, 2014. Because the actuarial accrued liability funding ratio (on a market value of assets basis) reached 90% for two consecutive years, the benefit increase reverted to 2.50% on January 1, 2015. If the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase.

Disability

Duty Disability	
Age/service requirement	Member who cannot perform his duties as a direct result of a disability relating to an act of duty specific to protecting the property and personal safety of others.
Amount	47.50% of Average Salary plus 1.90% of Average Salary for each year in excess of 25 years of Allowable Service (pro rata for completed months). Payment begins at disability and ends at age 65 or earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability.
Regular Disability	
Age/service requirement	At least one year of Allowable Service and a disability preventing member from performing normal duties that arise out of activities not related to covered employment or while at work, activities related to duties that do not present inherent dangers specific to occupation.

Summary of Plan Provisions (Continued)

Disability (Continued)	
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 10 years) and Average Salary at disability. Payment begins at disability and ends at age 65 or earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability.
Retirement benefit	
Age/service requirement	Age 65 with continued disability.
Amount	Any optional annuity continues. Otherwise, the larger of the disability benefit paid before age 65 or the normal retirement benefit available at age 65, or an actuarially equivalent optional annuity.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.
Death	
Surviving spouse benefit	
Age/service requirement	Vested active member at any age or vested former member age 50 or older who dies before retirement or disability benefit commences. If an active member dies, benefits may commence immediately, regardless of age.
Amount	Surviving spouse receives the 100% joint and survivor benefit using the Normal Retirement formula above. If commencement is prior to age 55, the appropriate early retirement formula described above applies except that one-half the monthly reduction factor is used from age 50 to the commencement age. In lieu of this benefit, the surviving spouse may elect a refund of contributions with interest or an actuarially equivalent term certain annuity (lump sum payable to estate at death).
Benefit increases	Same as for retirement.
Surviving dependent children's benefit	
Age/service requirement	If no surviving spouse, all dependent children (biological or adopted) below age 20 who are dependent for more than half of their support on deceased member.
Amount	Actuarially equivalent to surviving spouse 100% joint and survivor annuity payable to the later of age 20 or five years. The amount is to be proportionally divided among surviving children.
Refund of contributions	
Age/service requirement	Active employee dies and survivor benefits paid are less than member's contributions or a former employee dies before annuity begins.

Summary of Plan Provisions (Continued)

Death (Continued)	
Amount	If no survivor benefits are paid, the member's contributions with 6.00% interest until June 30, 2011; 4.00% interest thereafter. If survivor benefits are paid and accumulated contributions exceed total payments to the surviving spouse and children, then the remaining contributions are paid out.
Termination	
Refund of contributions	
Age/service requirement	Termination of local government service.
Amount	If member terminated before July 1, 2011, member's contributions with 6.00% interest compounded annually until June 30, 2011; 4.00% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually.
Deferred benefit	
Age/service requirement	A deferred annuity may be elected in lieu of a refund if vested. Partially or fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following percentage (augmentation), compounded annually, if termination of employment is prior to January 1, 2012: (a.) 3.00% (2.50% if hired after June 30, 2006) until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (b.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; and (c.) 1.00% from January 1, 2012 thereafter. If a member terminates employment after 2011, they are not eligible for augmentation.
Form of payment	Same as for retirement.
Actuarially equivalent factors	Actuarially equivalent factors based on the RP-2000 mortality table for healthy annuitants, white collar adjustment, projected to 2026 using scale AA, no setbacks, blended 65% males, 6.00% post-retirement interest, and 8.50% pre-retirement interest. The post-retirement interest rate assumption will change to 6.50% on the earlier of the effective date of the next mortality adjustment or July 1, 2017.

Summary of Plan Provisions (Concluded)

Combined service annuity	Members are eligible for combined service benefits if they: (a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or (b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010). Other requirements for combined service include: (a.) Member must have at least six months of allowable service credit in each plan worked under; and (b.) Member may not be in receipt of a benefit from another plan. 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	There have been no changes in plan provisions since the previous valuation.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Actuarial Methods used for the Determination of Total Pension Liability and Related Values

Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an **Individual Entry-Age Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Total Pension Liability.

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 2.50% post-retirement benefit increase. If the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.

Based on the assumptions and methods in this report, this plan is assumed to pay the 2.50% benefit increases indefinitely.

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 February 2012, prepared by a former actuary, reviews of inflation and investment assumptions, dated September 11, 2014 and September 11, 2017, and a recent asset liability study obtained by the State Board of Investment. The mortality assumption is based on the Public Employees' Police & Fire Plan experience study dated August 30, 2016. The Allowance for Combined Service Annuity assumptions are based on an analysis completed by the LCPR actuary and documented in a report dated October 2016.

Investment return	7.50% per annum.
Single Discount Rate	5.96% per annum.
Benefit increases after retirement	2.50% per annum.
Salary increases	Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service earned during the year.
Inflation	2.50% per year.
Payroll growth	3.25% per year.
Mortality rates	
Healthy pre-retirement	RP-2014 employee generational mortality table projected with mortality improvement scale MP-2016, from a base year of 2006.
Healthy post-retirement	RP-2014 annuitant generational mortality table projected with mortality improvement scale MP-2016 from a base year of 2006. Male rates are adjusted by a factor of 0.96.
Disabled	RP-2014 annuitant generational mortality table projected with mortality improvement scale MP-2016 from a base year of 2006. Male rates are adjusted by a factor of 0.96.
	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	Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are:

Year	Select Withdrawal Rates
1	25%
2	20%
3	15%

Summary of Actuarial Assumptions (Continued)

Disability	Age-related rates based on experience; see table of sample rates. All incidences are assumed to be duty-related.
Allowance for combined service annuity	Liabilities for former members are increased by 35.0% for vested members and 1.0% for non-vested members to account for the effect of some participants having eligibility for a Combined Service Annuity.
Administrative expenses	In the valuation year, equal to prior year administrative expenses expressed as 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 accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 55.
Percentage married	85% of active members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Females are assumed to be three years younger than their male spouses. For members in payment status, actual spouse date of birth is used, if provided.
Eligible children	Retiring members are assumed to have no dependent children.
Form of payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 5% elect 25% Joint & Survivor option 10% elect 50% Joint & Survivor option 10% elect 75% Joint & Survivor option 35% elect 100% Joint & Survivor option Females: 5% elect 25% Joint & Survivor option 5% elect 50% Joint & Survivor option 5% elect 75% Joint & Survivor option 5% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option. Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.
Decrement operation	Withdrawal decrements do not operate during retirement eligibility. Decrements are assumed to occur mid-fiscal year.
Service credit accruals	It is assumed that members accrue one year of service credit per year.
Pay Increases	Pay increases are assumed to happen at the beginning of the fiscal year. This is equivalent to assuming that reported earnings are pensionable earnings for the year ending on the valuation date.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.

In cases where submitted data was missing or incomplete, the following assumptions were applied:

Data for active members:

There were 68 members reported with a salary less than $100. We used prior year salary (47 members), if available; otherwise high five salary with a 10% load to account for salary increases (21 members). If neither prior year salary or high five salary was available, we assumed a value of $35,000.

There were also 43 members reported without a gender and 1 member reported without a date of birth. We assumed an entry age of 31 and male gender.

Data for terminated members:

We calculated benefits for these members using the reported Average Salary and credited service. There were no members reported without Average Salary. If credited service was not reported (26 members), we used elapsed time from hire date to termination date (16 members), otherwise we assumed nine years of service. If termination date was not reported (12 members), we assumed the termination date was equal to the hire date plus credited service, otherwise the valuation date. If the reported termination date occurs prior to the reported hire date, the two dates were swapped.

There were no members reported without a date of birth. There were 3 members reported without a gender; male was assumed.

Data for retired members:

There were no members reported without a date of birth, gender or benefit.

There were 8 members that were active last year, and retirement eligible, and not on the retiree data file this year. At the direction of PERA, we included these members in the 2017 valuation as retirees with an estimated life only monthly benefit.

Because PERA reclassifies disabled members as retirees once the member reaches Normal Retirement Age, we compare the members that PERA reports as retirees to our disabled group from the last valuation. If a member was disabled in the valuation, we reclassify that member as a disabled retiree in this year's valuation. We reclassified 54 retirees as disabled retirees in this valuation.

Summary of Actuarial Assumptions (Continued)

Changes in actuarial assumptions	The base mortality table for healthy annuitants was changed from the RP-2000 fully generational table to the RP-2014 fully generational table (with a base year of 2006), with male rates adjusted by a factor of 0.96. The mortality improvement scale was changed from Scale AA to Scale MP-2016, and is applied to healthy and disabled members. The base mortality table for disabled annuitants was changed from the RP-2000 disabled mortality table to the RP-2014 disabled annuitant mortality table (with future mortality improvement according to MP-2016). The Combined Service Annuity (CSA) load was 30% for vested and non-vested, deferred members. The CSA has been changed to 35% for vested members and 1% for non-vested members. The Single Discount Rate was changed from 5.31% per annum to 5.96% per annum.

Summary of Actuarial Assumptions (Continued)

	Percentage of Members Dying Each Year*					
	Healthy Post-Retirement Mortality		Healthy Pre-Retirement Mortality		Disability Mortality	
Age in 2017	Male	Female	Male	Female	Male	Female
20	0.03%	0.02%	0.04%	0.02%	0.03%	0.02%
25	0.05	0.03	0.05	0.02	0.05	0.03
30	0.08	0.06	0.05	0.02	0.08	0.06
35	0.12	0.11	0.06	0.03	0.12	0.11
40	0.18	0.17	0.07	0.04	0.18	0.17
45	0.26	0.21	0.10	0.07	0.26	0.21
50	0.39	0.27	0.17	0.11	0.39	0.27
55	0.55	0.38	0.28	0.17	0.55	0.38
60	0.77	0.56	0.48	0.26	0.77	0.56
65	1.10	0.84	0.86	0.39	1.10	0.84
70	1.65	1.31	1.42	0.64	1.65	1.31

* *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.*

	Withdrawal Rates		Disability Retirement	
Age	Male	Female	Male	Female
20	14.70%	14.20%	0.04%	0.04%
25	14.70%	14.20%	0.06%	0.06%
30	9.10%	11.40%	0.10%	0.08%
35	6.00%	8.60%	0.18%	0.11%
40	4.40%	6.90%	0.23%	0.18%
45	3.40%	4.30%	0.34%	0.39%
50	2.40%	3.10%	0.55%	0.70%
55	1.40%	2.20%	0.88%	1.18%
60	0.10%	0.20%	1.41%	2.41%
65	0.00%	0.00%	1.67%	2.67%

Summary of Actuarial Assumptions (Concluded)

Age	Retirement Rate
50	3%
51	2
52	2
53	2
54	5
55	20
56	8
57	8
58	8
59	8
60	15
61	15
62	30
63	30
64	30
65	40
66	40
67	40
68	40
69	40
70+	100

Salary Scale	
Age	Increase
20	8.50%
25	7.25
30	6.25
35	5.75
40	5.25
45	4.50
50	4.50
55	4.25
60	3.75
65	3.50
70+	3.50

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 Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term expected rate of return is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a “risk-free” rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this calculation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 3.56%; and **the resulting single discount rate is 5.96%**.

Benefit payments projected to occur up through June 30, 2061 were fully funded and benefit payments projected to occur in the year ended June 30, 2062 were partially funded. Assets were projected to be fully depleted by the fiscal year ending June 30, 2063. Benefit payments were discounted using 7.50%, the long-term expected rate of return on pension plan investments, as long as assets were sufficient to fund the benefit payments. Beginning in the July 1, 2061 to June 30, 2062 fiscal year, when benefit payments exceed the Plan’s Fiduciary Net Position, benefit payments were discounted at 3.56%, the municipal bond rate. An equivalent single discount rate was determined that produced approximately the same present value of projected benefits when applied to all years of projected benefits as the present value of projected benefits using 7.50% through the point of asset depletion and 3.56% after. For more information on the calculation of the equivalent present value of projected benefits, see pages 38 through 39 of this report.

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 (SDR). 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)

	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
2017	$ 200,103	$ -	$ 200,103				
2018	$ 208,037	$ -	$ 208,037	$ 12,129	$ 18,203	$ -	$ 30,332
2019	$ 196,579	$ 18,219	$ 214,798	$ 11,461	$ 17,201	$ -	$ 28,662
2020	$ 187,940	$ 33,839	$ 221,779	$ 10,957	$ 16,445	$ -	$ 27,402
2021	$ 180,882	$ 48,104	$ 228,986	$ 10,545	$ 15,827	$ -	$ 26,372
2022	$ 174,222	$ 62,207	$ 236,429	$ 10,157	$ 15,244	$ -	$ 25,401
2023	$ 167,896	$ 76,216	$ 244,112	$ 9,788	$ 14,691	$ -	$ 24,479
2024	$ 161,846	$ 90,200	$ 252,046	$ 9,436	$ 14,161	$ -	$ 23,597
2025	$ 155,773	$ 104,465	$ 260,238	$ 9,082	$ 13,630	$ -	$ 22,712
2026	$ 149,911	$ 118,784	$ 268,695	$ 8,740	$ 13,117	$ -	$ 21,857
2027	$ 144,166	$ 133,262	$ 277,428	$ 8,405	$ 12,614	$ -	$ 21,019
2028	$ 138,471	$ 147,973	$ 286,444	$ 8,073	$ 12,116	$ -	$ 20,189
2029	$ 132,926	$ 162,828	$ 295,754	$ 7,750	$ 11,631	$ -	$ 19,381
2030	$ 127,422	$ 177,944	$ 305,366	$ 7,429	$ 11,149	$ -	$ 18,578
2031	$ 121,834	$ 193,456	$ 315,290	$ 7,103	$ 10,661	$ -	$ 17,764
2032	$ 116,171	$ 209,366	$ 325,537	$ 6,773	$ 10,165	$ -	$ 16,938
2033	$ 110,497	$ 225,620	$ 336,117	$ 6,442	$ 9,669	$ -	$ 16,111
2034	$ 104,862	$ 242,179	$ 347,041	$ 6,113	$ 9,175	$ -	$ 15,288
2035	$ 99,265	$ 259,055	$ 358,320	$ 5,787	$ 8,686	$ -	$ 14,473
2036	$ 93,719	$ 276,246	$ 369,965	$ 5,464	$ 8,200	$ -	$ 13,664
2037	$ 88,227	$ 293,762	$ 381,989	$ 5,144	$ 7,720	$ -	$ 12,864
2038	$ 82,783	$ 311,621	$ 394,404	$ 4,826	$ 7,244	$ -	$ 12,070
2039	$ 77,279	$ 329,943	$ 407,222	$ 4,505	$ 6,762	$ -	$ 11,267
2040	$ 71,704	$ 348,752	$ 420,456	$ 4,180	$ 6,274	$ -	$ 10,454
2041	$ 66,206	$ 367,915	$ 434,121	$ 3,860	$ 5,793	$ -	$ 9,653
2042	$ 60,840	$ 387,390	$ 448,230	$ 3,547	$ 5,324	$ -	$ 8,871
2043	$ 55,575	$ 407,223	$ 462,798	$ 3,240	$ 4,863	$ -	$ 8,103
2044	$ 50,317	$ 427,522	$ 477,839	$ 2,933	$ 4,403	$ -	$ 7,336
2045	$ 45,080	$ 448,288	$ 493,368	$ 2,628	$ 3,945	$ -	$ 6,573
2046	$ 39,898	$ 469,505	$ 509,403	$ 2,326	$ 3,491	$ -	$ 5,817
2047	$ 34,810	$ 491,148	$ 525,958	$ 2,029	$ 3,046	$ -	$ 5,075
2048	$ 29,960	$ 513,092	$ 543,052	$ 1,747	$ 2,621	$ -	$ 4,368
2049	$ 25,486	$ 535,215	$ 560,701	$ 1,486	$ 2,230	$ -	$ 3,716
2050	$ 21,433	$ 557,491	$ 578,924	$ 1,250	$ 1,875	$ -	$ 3,125
2051	$ 17,744	$ 579,995	$ 597,739	$ 1,034	$ 1,553	$ -	$ 2,587
2052	$ 14,400	$ 602,766	$ 617,166	$ 840	$ 1,260	$ -	$ 2,100
2053	$ 11,399	$ 625,824	$ 637,223	$ 665	$ 997	$ -	$ 1,662
2054	$ 8,745	$ 649,188	$ 657,933	$ 510	$ 765	$ -	$ 1,275
2055	$ 6,465	$ 672,851	$ 679,316	$ 377	$ 566	$ -	$ 943
2056	$ 4,601	$ 696,793	$ 701,394	$ 268	$ 403	$ -	$ 671
2057	$ 3,161	$ 721,028	$ 724,189	$ 184	$ 277	$ -	$ 461
2058	$ 2,089	$ 745,636	$ 747,725	$ 122	$ 183	$ -	$ 305
2059	$ 1,327	$ 770,699	$ 772,026	$ 77	$ 116	$ -	$ 193
2060	$ 810	$ 796,307	$ 797,117	$ 47	$ 71	$ -	$ 118
2061	$ 473	$ 822,551	$ 823,024	$ 28	$ 41	$ -	$ 69
2062	$ 260	$ 849,512	$ 849,772	$ 15	$ 23	$ -	$ 38
2063	$ 132	$ 877,257	$ 877,389	$ 8	$ 12	$ -	$ 20
2064	$ 61	$ 905,844	$ 905,905	$ 4	$ 5	$ -	$ 9
2065	$ 26	$ 935,320	$ 935,346	$ 2	$ 2	$ -	$ 4
2066	$ 10	$ 965,735	$ 965,745	$ 1	$ 1	$ -	$ 2
2067	$ 3	$ 997,129	$ 997,132	$ -	$ -	$ -	$ -

Contributions related to future employees in excess of normal cost and expenses of 15.18% of pay.

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

	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
2068	$ 1	$ 1,029,538	$ 1,029,539	$ -	$ -	$ -	$ -
2069	$ -	$ 1,062,999	$ 1,062,999	$ -	$ -	$ -	$ -
2070	$ -	$ 1,097,546	$ 1,097,546	$ -	$ -	$ -	$ -
2071	$ -	$ 1,133,216	$ 1,133,216	$ -	$ -	$ -	$ -
2072	$ -	$ 1,170,046	$ 1,170,046	$ -	$ -	$ -	$ -
2073	$ -	$ 1,208,072	$ 1,208,072	$ -	$ -	$ -	$ -
2074	$ -	$ 1,247,335	$ 1,247,335	$ -	$ -	$ -	$ -
2075	$ -	$ 1,287,873	$ 1,287,873	$ -	$ -	$ -	$ -
2076	$ -	$ 1,329,729	$ 1,329,729	$ -	$ -	$ -	$ -
2077	$ -	$ 1,372,945	$ 1,372,945	$ -	$ -	$ -	$ -
2078	$ -	$ 1,417,566	$ 1,417,566	$ -	$ -	$ -	$ -
2079	$ -	$ 1,463,637	$ 1,463,637	$ -	$ -	$ -	$ -
2080	$ -	$ 1,511,205	$ 1,511,205	$ -	$ -	$ -	$ -
2081	$ -	$ 1,560,319	$ 1,560,319	$ -	$ -	$ -	$ -
2082	$ -	$ 1,611,030	$ 1,611,030	$ -	$ -	$ -	$ -
2083	$ -	$ 1,663,388	$ 1,663,388	$ -	$ -	$ -	$ -
2084	$ -	$ 1,717,448	$ 1,717,448	$ -	$ -	$ -	$ -
2085	$ -	$ 1,773,265	$ 1,773,265	$ -	$ -	$ -	$ -
2086	$ -	$ 1,830,896	$ 1,830,896	$ -	$ -	$ -	$ -
2087	$ -	$ 1,890,401	$ 1,890,401	$ -	$ -	$ -	$ -
2088	$ -	$ 1,951,839	$ 1,951,839	$ -	$ -	$ -	$ -
2089	$ -	$ 2,015,273	$ 2,015,273	$ -	$ -	$ -	$ -
2090	$ -	$ 2,080,770	$ 2,080,770	$ -	$ -	$ -	$ -
2091	$ -	$ 2,148,395	$ 2,148,395	$ -	$ -	$ -	$ -
2092	$ -	$ 2,218,218	$ 2,218,218	$ -	$ -	$ -	$ -
2093	$ -	$ 2,290,310	$ 2,290,310	$ -	$ -	$ -	$ -
2094	$ -	$ 2,364,745	$ 2,364,745	$ -	$ -	$ -	$ -
2095	$ -	$ 2,441,599	$ 2,441,599	$ -	$ -	$ -	$ -
2096	$ -	$ 2,520,951	$ 2,520,951	$ -	$ -	$ -	$ -
2097	$ -	$ 2,602,882	$ 2,602,882	$ -	$ -	$ -	$ -
2098	$ -	$ 2,687,475	$ 2,687,475	$ -	$ -	$ -	$ -
2099	$ -	$ 2,774,818	$ 2,774,818	$ -	$ -	$ -	$ -
2100	$ -	$ 2,865,000	$ 2,865,000	$ -	$ -	$ -	$ -
2101	$ -	$ 2,958,112	$ 2,958,112	$ -	$ -	$ -	$ -
2102	$ -	$ 3,054,251	$ 3,054,251	$ -	$ -	$ -	$ -
2103	$ -	$ 3,153,514	$ 3,153,514	$ -	$ -	$ -	$ -
2104	$ -	$ 3,256,003	$ 3,256,003	$ -	$ -	$ -	$ -
2105	$ -	$ 3,361,824	$ 3,361,824	$ -	$ -	$ -	$ -
2106	$ -	$ 3,471,083	$ 3,471,083	$ -	$ -	$ -	$ -
2107	$ -	$ 3,583,893	$ 3,583,893	$ -	$ -	$ -	$ -
2108	$ -	$ 3,700,370	$ 3,700,370	$ -	$ -	$ -	$ -
2109	$ -	$ 3,820,632	$ 3,820,632	$ -	$ -	$ -	$ -
2110	$ -	$ 3,944,802	$ 3,944,802	$ -	$ -	$ -	$ -
2111	$ -	$ 4,073,008	$ 4,073,008	$ -	$ -	$ -	$ -
2112	$ -	$ 4,205,381	$ 4,205,381	$ -	$ -	$ -	$ -
2113	$ -	$ 4,342,056	$ 4,342,056	$ -	$ -	$ -	$ -
2114	$ -	$ 4,483,173	$ 4,483,173	$ -	$ -	$ -	$ -
2115	$ -	$ 4,628,876	$ 4,628,876	$ -	$ -	$ -	$ -
2116	$ -	$ 4,779,314	$ 4,779,314	$ -	$ -	$ -	$ -
2117	$ -	$ 4,934,642	$ 4,934,642	$ -	$ -	$ -	$ -

**Contributions related to future employees in excess of normal cost and expenses of 15.18% of pay.*

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

Fiscal Year Ending	Projected Beginning Plan 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	$ 602,460	$ 30,332	$ 16,104	$ 333	$ 45,696	$ 662,051
2019	$ 662,051	$ 28,662	$ 18,442	$ 315	$ 50,019	$ 721,975
2020	$ 721,975	$ 27,402	$ 20,954	$ 301	$ 54,374	$ 782,496
2021	$ 782,496	$ 26,372	$ 23,694	$ 289	$ 58,775	$ 843,660
2022	$ 843,660	$ 25,401	$ 26,722	$ 279	$ 63,215	$ 905,275
2023	$ 905,275	$ 24,479	$ 30,130	$ 269	$ 67,678	$ 967,033
2024	$ 967,033	$ 23,597	$ 33,703	$ 259	$ 72,146	$ 1,028,814
2025	$ 1,028,814	$ 22,712	$ 37,640	$ 249	$ 76,602	$ 1,090,239
2026	$ 1,090,239	$ 21,857	$ 42,065	$ 240	$ 81,015	$ 1,150,806
2027	$ 1,150,806	$ 21,019	$ 46,644	$ 231	$ 85,358	$ 1,210,308
2028	$ 1,210,308	$ 20,189	$ 51,319	$ 222	$ 89,619	$ 1,268,575
2029	$ 1,268,575	$ 19,381	$ 56,254	$ 213	$ 93,778	$ 1,325,267
2030	$ 1,325,267	$ 18,578	$ 61,387	$ 204	$ 97,811	$ 1,380,065
2031	$ 1,380,065	$ 17,764	$ 66,847	$ 195	$ 101,690	$ 1,432,477
2032	$ 1,432,477	$ 16,938	$ 72,404	$ 186	$ 105,387	$ 1,482,212
2033	$ 1,482,212	$ 16,111	$ 78,407	$ 177	$ 108,866	$ 1,528,605
2034	$ 1,528,605	$ 15,288	$ 84,506	$ 168	$ 112,090	$ 1,571,309
2035	$ 1,571,309	$ 14,473	$ 90,588	$ 159	$ 115,040	$ 1,610,075
2036	$ 1,610,075	$ 13,664	$ 96,863	$ 150	$ 117,687	$ 1,644,413
2037	$ 1,644,413	$ 12,864	$ 103,336	$ 141	$ 119,994	$ 1,673,794
2038	$ 1,673,794	$ 12,070	$ 109,721	$ 132	$ 121,934	$ 1,697,945
2039	$ 1,697,945	$ 11,267	$ 116,178	$ 124	$ 123,478	$ 1,716,388
2040	$ 1,716,388	$ 10,454	$ 122,604	$ 115	$ 124,595	$ 1,728,718
2041	$ 1,728,718	$ 9,653	$ 128,921	$ 106	$ 125,258	$ 1,734,602
2042	$ 1,734,602	$ 8,871	$ 134,934	$ 97	$ 125,450	$ 1,733,892
2043	$ 1,733,892	$ 8,103	$ 140,710	$ 89	$ 125,156	$ 1,726,352
2044	$ 1,726,352	$ 7,336	$ 146,406	$ 81	$ 124,353	$ 1,711,554
2045	$ 1,711,554	$ 6,573	$ 152,011	$ 72	$ 123,009	$ 1,689,053
2046	$ 1,689,053	$ 5,817	$ 157,459	$ 64	$ 121,093	$ 1,658,440
2047	$ 1,658,440	$ 5,075	$ 162,733	$ 56	$ 118,576	$ 1,619,302
2048	$ 1,619,302	$ 4,368	$ 167,609	$ 48	$ 115,435	$ 1,571,448
2049	$ 1,571,448	$ 3,716	$ 171,854	$ 41	$ 111,666	$ 1,514,935
2050	$ 1,514,935	$ 3,125	$ 175,394	$ 34	$ 107,276	$ 1,449,908
2051	$ 1,449,908	$ 2,587	$ 178,324	$ 28	$ 102,271	$ 1,376,414
2052	$ 1,376,414	$ 2,100	$ 180,679	$ 23	$ 96,655	$ 1,294,467
2053	$ 1,294,467	$ 1,662	$ 182,503	$ 18	$ 90,426	$ 1,204,034
2054	$ 1,204,034	$ 1,275	$ 183,813	$ 14	$ 83,581	$ 1,105,063
2055	$ 1,105,063	$ 943	$ 184,606	$ 10	$ 76,116	$ 997,506
2056	$ 997,506	$ 671	$ 184,847	$ 7	$ 68,031	$ 881,354
2057	$ 881,354	$ 461	$ 184,522	$ 5	$ 59,324	$ 756,612
2058	$ 756,612	$ 305	$ 183,653	$ 3	$ 49,994	$ 623,255
2059	$ 623,255	$ 193	$ 182,264	$ 2	$ 40,040	$ 481,222
2060	$ 481,222	$ 118	$ 180,390	$ 1	$ 29,454	$ 330,403
2061	$ 330,403	$ 69	$ 178,067	$ 1	$ 18,226	$ 170,630
2062	$ 170,630	$ 38	$ 175,328	$ -	$ 6,343	$ 1,683
2063	$ 1,683	$ 20	$ 172,203	$ -	$ -	$ -
2064	$ -	$ 9	$ 168,712	$ -	$ -	$ -
2065	$ -	$ 4	$ 164,875	$ -	$ -	$ -
2066	$ -	$ 2	$ 160,715	$ -	$ -	$ -
2067	$ -	$ -	$ 156,248	$ -	$ -	$ -

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

Fiscal Year Ending	Projected Beginning Plan 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	$ -	$ -	$ 151,491	$ -	$ -	$ -
2069	$ -	$ -	$ 146,460	$ -	$ -	$ -
2070	$ -	$ -	$ 141,175	$ -	$ -	$ -
2071	$ -	$ -	$ 135,656	$ -	$ -	$ -
2072	$ -	$ -	$ 129,927	$ -	$ -	$ -
2073	$ -	$ -	$ 124,011	$ -	$ -	$ -
2074	$ -	$ -	$ 117,935	$ -	$ -	$ -
2075	$ -	$ -	$ 111,728	$ -	$ -	$ -
2076	$ -	$ -	$ 105,419	$ -	$ -	$ -
2077	$ -	$ -	$ 99,039	$ -	$ -	$ -
2078	$ -	$ -	$ 92,622	$ -	$ -	$ -
2079	$ -	$ -	$ 86,201	$ -	$ -	$ -
2080	$ -	$ -	$ 79,810	$ -	$ -	$ -
2081	$ -	$ -	$ 73,484	$ -	$ -	$ -
2082	$ -	$ -	$ 67,260	$ -	$ -	$ -
2083	$ -	$ -	$ 61,174	$ -	$ -	$ -
2084	$ -	$ -	$ 55,264	$ -	$ -	$ -
2085	$ -	$ -	$ 49,567	$ -	$ -	$ -
2086	$ -	$ -	$ 44,119	$ -	$ -	$ -
2087	$ -	$ -	$ 38,951	$ -	$ -	$ -
2088	$ -	$ -	$ 34,089	$ -	$ -	$ -
2089	$ -	$ -	$ 29,554	$ -	$ -	$ -
2090	$ -	$ -	$ 25,364	$ -	$ -	$ -
2091	$ -	$ -	$ 21,529	$ -	$ -	$ -
2092	$ -	$ -	$ 18,059	$ -	$ -	$ -
2093	$ -	$ -	$ 14,956	$ -	$ -	$ -
2094	$ -	$ -	$ 12,218	$ -	$ -	$ -
2095	$ -	$ -	$ 9,837	$ -	$ -	$ -
2096	$ -	$ -	$ 7,797	$ -	$ -	$ -
2097	$ -	$ -	$ 6,080	$ -	$ -	$ -
2098	$ -	$ -	$ 4,659	$ -	$ -	$ -
2099	$ -	$ -	$ 3,506	$ -	$ -	$ -
2100	$ -	$ -	$ 2,590	$ -	$ -	$ -
2101	$ -	$ -	$ 1,876	$ -	$ -	$ -
2102	$ -	$ -	$ 1,333	$ -	$ -	$ -
2103	$ -	$ -	$ 929	$ -	$ -	$ -
2104	$ -	$ -	$ 637	$ -	$ -	$ -
2105	$ -	$ -	$ 429	$ -	$ -	$ -
2106	$ -	$ -	$ 286	$ -	$ -	$ -
2107	$ -	$ -	$ 189	$ -	$ -	$ -
2108	$ -	$ -	$ 125	$ -	$ -	$ -
2109	$ -	$ -	$ 83	$ -	$ -	$ -
2110	$ -	$ -	$ 56	$ -	$ -	$ -
2111	$ -	$ -	$ 39	$ -	$ -	$ -
2112	$ -	$ -	$ 27	$ -	$ -	$ -
2113	$ -	$ -	$ 20	$ -	$ -	$ -
2114	$ -	$ -	$ 15	$ -	$ -	$ -
2115	$ -	$ -	$ 11	$ -	$ -	$ -
2116	$ -	$ -	$ 9	$ -	$ -	$ -
2117	$ -	$ -	$ 7	$ -	$ -	$ -

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

Fiscal Year Ending	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
2018	$ 602,460	$ 16,104	$ 16,104	$ 0	$ 15,532	$ 0	$ 15,644
2019	662,051	18,442	18,442	0	16,546	0	16,909
2020	721,974	20,954	20,954	0	17,489	0	18,131
2021	782,495	23,694	23,694	0	18,396	0	19,349
2022	843,659	26,722	26,722	0	19,299	0	20,594
2023	905,275	30,130	30,130	0	20,242	0	21,914
2024	967,033	33,703	33,703	0	21,063	0	23,134
2025	1,028,813	37,640	37,640	0	21,882	0	24,383
2026	1,090,239	42,065	42,065	0	22,748	0	25,717
2027	1,150,806	46,644	46,644	0	23,465	0	26,913
2028	1,210,309	51,319	51,319	0	24,016	0	27,945
2029	1,268,576	56,254	56,254	0	24,488	0	28,909
2030	1,325,268	61,387	61,387	0	24,858	0	29,773
2031	1,380,066	66,847	66,847	0	25,181	0	30,597
2032	1,432,478	72,404	72,404	0	25,371	0	31,277
2033	1,482,213	78,407	78,407	0	25,558	0	31,965
2034	1,528,605	84,506	84,506	0	25,624	0	32,514
2035	1,571,310	90,588	90,588	0	25,552	0	32,894
2036	1,610,076	96,863	96,863	0	25,416	0	33,194
2037	1,644,414	103,336	103,336	0	25,222	0	33,420
2038	1,673,795	109,721	109,721	0	24,912	0	33,489
2039	1,697,946	116,178	116,178	0	24,538	0	33,466
2040	1,716,389	122,604	122,604	0	24,089	0	33,330
2041	1,728,721	128,921	128,921	0	23,563	0	33,077
2042	1,734,605	134,934	134,934	0	22,941	0	32,672
2043	1,733,895	140,710	140,710	0	22,254	0	32,155
2044	1,726,354	146,406	146,406	0	21,539	0	31,574
2045	1,711,557	152,011	152,011	0	20,804	0	30,939
2046	1,689,055	157,459	157,459	0	20,046	0	30,246
2047	1,658,442	162,733	162,733	0	19,272	0	29,501
2048	1,619,305	167,609	167,609	0	18,465	0	28,676
2049	1,571,451	171,854	171,854	0	17,611	0	27,748
2050	1,514,939	175,394	175,394	0	16,720	0	26,727
2051	1,449,911	178,324	178,324	0	15,813	0	25,645
2052	1,376,417	180,679	180,679	0	14,904	0	24,522
2053	1,294,469	182,503	182,503	0	14,005	0	23,377
2054	1,204,035	183,813	183,813	0	13,121	0	22,220
2055	1,105,063	184,606	184,606	0	12,258	0	21,061
2056	997,506	184,847	184,847	0	11,418	0	19,902
2057	881,354	184,522	184,522	0	10,603	0	18,750
2058	756,611	183,653	183,653	0	9,816	0	17,612
2059	623,254	182,264	182,264	0	9,063	0	16,496
2060	481,221	180,390	180,390	0	8,344	0	15,408
2061	330,401	178,067	178,067	0	7,662	0	14,354
2062	170,628	175,328	170,628	4,700	6,829	991	13,338
2063	1,680	172,203	1,680	170,523	63	34,717	12,364
2064	0	168,712	0	168,712	0	33,168	11,432
2065	0	164,875	0	164,875	0	31,299	10,543
2066	0	160,715	0	160,715	0	29,461	9,699
2067	0	156,248	0	156,248	0	27,657	8,899

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

Fiscal Year Ending	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
2068	$ -	$ 151,491	$ -	$ 151,491	$ -	$ 25,893	$ 8,143
2069	0	146,460	0	146,460	0	24,173	7,430
2070	0	141,175	0	141,175	0	22,500	6,759
2071	0	135,656	0	135,656	0	20,877	6,129
2072	0	129,927	0	129,927	0	19,308	5,540
2073	0	124,011	0	124,011	0	17,795	4,991
2074	0	117,935	0	117,935	0	16,342	4,479
2075	0	111,728	0	111,728	0	14,949	4,005
2076	0	105,419	0	105,419	0	13,620	3,566
2077	0	99,039	0	99,039	0	12,356	3,162
2078	0	92,622	0	92,622	0	11,158	2,791
2079	0	86,201	0	86,201	0	10,028	2,451
2080	0	79,810	0	79,810	0	8,965	2,142
2081	0	73,484	0	73,484	0	7,971	1,861
2082	0	67,260	0	67,260	0	7,045	1,608
2083	0	61,174	0	61,174	0	6,187	1,380
2084	0	55,264	0	55,264	0	5,397	1,177
2085	0	49,567	0	49,567	0	4,674	996
2086	0	44,119	0	44,119	0	4,018	837
2087	0	38,951	0	38,951	0	3,425	697
2088	0	34,089	0	34,089	0	2,895	576
2089	0	29,554	0	29,554	0	2,423	471
2090	0	25,364	0	25,364	0	2,008	382
2091	0	21,529	0	21,529	0	1,646	306
2092	0	18,059	0	18,059	0	1,333	242
2093	0	14,956	0	14,956	0	1,066	189
2094	0	12,218	0	12,218	0	841	146
2095	0	9,837	0	9,837	0	654	111
2096	0	7,797	0	7,797	0	500	83
2097	0	6,080	0	6,080	0	377	61
2098	0	4,659	0	4,659	0	279	44
2099	0	3,506	0	3,506	0	203	31
2100	0	2,590	0	2,590	0	145	22
2101	0	1,876	0	1,876	0	101	15
2102	0	1,333	0	1,333	0	69	10
2103	0	929	0	929	0	47	7
2104	0	637	0	637	0	31	4
2105	0	429	0	429	0	20	3
2106	0	286	0	286	0	13	2
2107	0	189	0	189	0	8	1
2108	0	125	0	125	0	5	1
2109	0	83	0	83	0	3	0
2110	0	56	0	56	0	2	0
2111	0	39	0	39	0	1	0
2112	0	27	0	27	0	1	0
2113	0	20	0	20	0	1	0
2114	0	15	0	15	0	1	0
2115	0	11	0	11	0	0	0
2116	0	9	0	9	0	0	0
2117	0	7	0	7	0	0	0
				Totals	$ 858,599	$ 428,648	$ 1,287,247

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 (meets the statutory salary definition) and does not include pay above any pay cap.
Deferred Inflows and Outflows of Resources	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
Discount Rate or Single Discount Rate	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: 1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and 2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.
Entry Age Actuarial Cost Method or Entry Age Normal (EAN)	The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit 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

GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Fiduciary Net Position	The fiduciary net position is the value of the assets of the trust.
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 contribution entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contribution Entities	Non-employer contribution 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 contribution 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 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 in pension plan investments
Total Pension Liability (TPL)	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability (UAAL)	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	The valuation assets are the plan fiduciary net position used in determining the net pension liability of the plan. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.

Public Employees Retirement Association of Minnesota

Public Employees Police and Fire Plan
GASB Statements No. 67 and No. 68 Accounting and Financial Reporting for Pensions
June 30, 2017

GRS Retirement Consulting
P: 800.521.0498 | F: 763.432.5842 | www.grsconsulting.com

November 10, 2017

Public Employees Retirement Association of Minnesota
Public Employees Police and Fire Plan
St. Paul, Minnesota

Dear Trustees of the Public Employees Police and Fire Plan:

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 General Employees Retirement Plan ("GERP"), 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 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. PERA is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer. This report may be provided to parties other than the Public Employees Retirement Association (PERA) only in its entirety and only with the permission of PERA. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by PERA, 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 data, economic and demographic assumptions, and benefit provisions.

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

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Public Employees Police and Fire Plan 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

Table of Contents

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
Employer's Fiscal Year Ending Date (Reporting Date)	Varies by Employer
Membership	
Number of	
- Service Retirements	7,408
- Survivors	1,861
- Disability Retirements	1,310
- Deferred Retirements	1,506
- Terminated other non-vested	1,134
- Active Members	11,522
- Total	24,741
Covered Payroll	$ 944,296
Net Pension Liability	
Total Pension Liability	$ 9,268,998
Plan Fiduciary Net Position	$ 7,918,879
Net Pension Liability	$ 1,350,119
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	85.43%
Net Pension Liability as a Percentage of Covered Payroll	142.98%
Development of the Single Discount Rate	
Single Discount Rate	7.50%
Long-Term Expected Rate of Investment Return	7.50%
Long-Term Municipal Bond Rate*	3.56%
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)	**$ 255,264**

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

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	$ 31,682	$ 360,939
Changes in assumptions	$ 1,874,881	$ 1,916,834
Net difference between projected and actual earnings on pension plan investments	$ 446,957	$ 561,646
Total	$ 2,353,520	$ 2,839,419

* *Source:* *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. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*

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. Governmental Accounting Standards Board (GASB) Statement No. 82, Pension Issues, is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

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

Financial Statements

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

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

Required Supplementary Information

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.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to 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.

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 market value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain approximately level as a percentage of payroll.
2. The funded status of the plan is expected to increase gradually toward a 100% funded ratio.

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.

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 the weekly rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index") 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	$	318,401
2.	Interest on the Total Pension Liability	$	616,740
3.	Current-Period Benefit Changes	$	-
4.	Employee Contributions (made negative for addition here)	$	(101,984)
5.	Projected Earnings on Plan Investments (made negative for addition here)	$	(523,426)
6.	Pension Plan Administrative Expense	$	992
7.	Other Changes in Plan Fiduciary Net Position	$	(24)
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	$	6,215
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period	$	(383,367)
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	$	(107,103)
11.	**Increase/(Decrease) from Experience in the Current Reporting Period**	**$**	**(173,556)**
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	$	(99,146)
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods	$	495,716
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	$	32,250
15.	**Total Pension Expense / (Income)**	**$**	**255,264**

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	37,292
2. Assumption Changes (gains) or losses	(2,300,201)
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	6.0000
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	6,215
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	(383,367)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	(377,152)
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	31,077
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	(1,916,834)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	(1,885,757)
B. Outflows (Inflows) of Resources due to Assets	
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	(535,516)
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	(107,103)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	(428,413)

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 of Resources
1. Due to Liabilities	$ 502,233	$ 482,815	$ 19,418
2. Due to Assets	165,482	240,335	(74,853)
3. Total	$ 667,715	$ 723,150	$ (55,435)

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ 6,517	$ 99,448	$ (92,931)
2. Assumption Changes	495,716	383,367	112,349
3. Net Difference between projected and actual earnings on pension plan investments	165,482	240,335	(74,853)
4. Total	$ 667,715	$ 723,150	$ (55,435)

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 of Resources
1. Differences between expected and actual experience	$ 31,682	$ 360,939	$ (329,257)
2. Assumption Changes	1,874,881	1,916,834	(41,953)
3. Net Difference between projected and actual earnings on pension plan investments	446,957	561,646	(114,689)
4. Total	$ 2,353,520	$ 2,839,419	$ (485,899)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2018	$ (55,435)
2019	77,799
2020	(25,988)
2021	(105,124)
2022	(377,151)
Thereafter	0
Total	$ (485,899)

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

	Market Value			
Assets in Trust	**June 30, 2017**		**June 30, 2016**	
Cash, Equivalents, Short Term Securities	$ 190,809		$ 145,521	
Fixed Income	$ 1,535,288		$ 1,751,552	
Equity	$ 5,141,012		$ 4,282,601	
SBI Alternative	$ 1,038,994		$ 908,179	
Other	$ -		$ -	
Total Assets in Trust	**$ 7,906,103**		**$ 7,087,853**	
Assets Receivable	$ 18,348	*	$ 15,918	**
Amounts Payable	$ (5,572)		$ (5,681)	
Net Position Restricted for Pensions	**$ 7,918,879**		**$ 7,098,090**	

** Includes $13.648 contribution from Minneapolis to be paid by July 15, 2017.*
*** Includes $13.648 contribution from Minneapolis paid by July 15, 2016.*

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

Change in Assets		**Market Value**	
Year Ending		**June 30, 2017**	**June 30, 2016**
1.	Fund balance at market value at beginning of year	$ 7,098,090	$ 7,348,704
2.	Contributions		
	a. Member	$ 101,984	$ 95,172
	b. Employer	$ 166,329 *	$ 156,065 **
	c. Other sources	$ 9,000	$ 9,000
	d. Total contributions	$ 277,313	$ 260,237
3.	Investment income		
	a. Investment income/(loss)	$ 1,067,162	$ 549
	b. Investment expenses	$ (8,220)	$ (9,498)
	c. Net subtotal	$ 1,058,942	$ (8,949)
4.	Other	$ 24	$ 3
5.	**Total additions:** *(2.d.) + (3.c.) + (4.)*	**$ 1,336,279**	**$ 251,291**
6.	Benefits Paid		
	a. Annuity benefits	$ (512,379)	$ (498,608)
	b. Refunds	$ (2,119)	$ (2,391)
	c. Total benefits paid	$ (514,498)	$ (500,999)
7.	Expenses		
	a. Other	$ -	$ -
	b. Administrative	$ (992)	$ (906)
	c. Total expenses	$ (992)	$ (906)
8.	**Total deductions:** *(6.c.) + (7.c.)*	**$ (515,490)**	**$ (501,905)**
9.	Net increase (decrease) in net position: *(5) + (8)*	$ 820,789	$ (250,614)
10.	**Net position restricted for pensions**	**$ 7,918,879**	**$ 7,098,090**
11.	Approximate return on market value of assets	15.2%	-0.1%

** Includes $13.648 contribution from Minneapolis to be paid by July 15, 2017.*

*** Includes $13.648 contribution from Minneapolis paid by July 15, 2016.*

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	$	318,401
2. Interest on the total pension liability	$	616,740
3. Changes of benefit terms	$	-
4. Difference between expected and actual experience of the total pension liability*	$	37,292
5. Changes of assumptions	$	(2,300,201)
6. Benefit payments, including refunds of employee contributions	$	(514,498)
7. Net change in total pension liability	$	(1,842,266)
8. Total pension liability – beginning	$	11,111,264
9. Total pension liability – ending	**$**	**9,268,998**
B. Plan fiduciary net position		
1. Contributions – employer	$	175,329
2. Contributions – employee	$	101,984
3. Net investment income	$	1,058,942
4. Benefit payments, including refunds of employee contributions	$	(514,498)
5. Pension Plan Administrative Expense	$	(992)
6. Other	$	24
7. Net change in plan fiduciary net position	$	820,789
8. Plan fiduciary net position – beginning	$	7,098,090
9. Plan fiduciary net position – ending	**$**	**7,918,879**
C. Net pension liability	**$**	**1,350,119**
D. Plan fiduciary net position as a percentage of the total pension liability		**85.43%**
E. Covered-employee payroll^	**$**	**944,296**
F. Net pension liability as a percentage of covered-employee payroll		**142.98%**

**Includes impact of changes in expected timing of future COLA increases.*

^Assumed equal to actual member contributions divided by employee 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 may be built prospectively)

Fiscal year ending June 30,	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total Pension Liability										
Service Cost	$ 318,401	$ 194,352	$ 187,959	$ 169,124						
Interest on the Total Pension Liability	$ 616,740	$ 658,198	$ 648,233	$ 598,165						
Benefit Changes	$ -	$ -	$ -	$ -						
Difference between Expected and Actual Experience	$ 37,292	$ (375,575)	$ (221,112)	$ 1,813						
Assumption Changes	$ (2,300,201)	$ 2,650,350	$ -	$ 323,945						
Benefit Payments	$ (512,379)	$ (498,608)	$ (481,330)	$ (452,462)						
Refunds	$ (2,119)	$ (2,391)	$ (1,953)	$ (1,633)						
Net Change in Total Pension Liability	$ (1,842,266)	$ 2,626,326	$ 131,797	$ 638,952						
Total Pension Liability - Beginning	$ 11,111,264	$ 8,484,938	$ 8,353,141	$ 7,714,189						
Total Pension Liability - Ending (a)	$ 9,268,998	$ 11,111,264	$ 8,484,938	$ 8,353,141						
Plan Fiduciary Net Position										
Employer Contributions	$ 175,329	$ 165,065	$ 153,317	$ 141,632						
Employee Contributions	$ 101,984	$ 95,172	$ 88,733	$ 81,213						
Pension Plan Net Investment Income	$ 1,058,942	$ (8,949)	$ 317,556	$ 1,158,389						
Benefit Payments	$ (512,379)	$ (498,608)	$ (481,330)	$ (452,462)						
Refunds	$ (2,119)	$ (2,391)	$ (1,953)	$ (1,633)						
Pension Plan Administrative Expense	$ (992)	$ (906)	$ (803)	$ (798)						
Other	$ 24	$ 3	$ 84	$ 18						
Net Change in Plan Fiduciary Net Position	$ 820,789	$ (250,614)	$ 75,604	$ 926,359						
Plan Fiduciary Net Position - Beginning	$ 7,098,090	$ 7,348,704	$ 7,273,100	$ 6,346,741						
Plan Fiduciary Net Position - Ending (b)	$ 7,918,879	$ 7,098,090	$ 7,348,704	$ 7,273,100						
Net Pension Liability - Ending (a) - (b)	$ 1,350,119	$ 4,013,174	$ 1,136,234	$ 1,080,041						
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	85.43 %	63.88 %	86.61 %	87.07 %						
Covered Employee Payroll	$ 944,296	$ 881,222	$ 845,076	$ 820,333						
Net Pension Liability as a Percentage of Covered Employee Payroll	142.98 %	455.41 %	134.45 %	131.66 %						

Notes to Schedule:

N/A

Schedules of Required Supplementary Information
Schedule of the Net Pension Liability Multiyear
(Dollars in Thousands)

Last 10 Fiscal Years (which may be built prospectively)

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 8,353,141	$ 7,273,100	$ 1,080,041	87.07%	$ 820,333	131.66%
2015	$ 8,484,938	$ 7,348,704	$ 1,136,234	86.61%	$ 845,076	134.45%
2016	$ 11,111,264	$ 7,098,090	$ 4,013,174	63.88%	$ 881,222	455.41%
2017	$ 9,268,998	$ 7,918,879	$ 1,350,119	85.43%	$ 944,296	142.98%

Schedule of Contributions Multiyear
(Dollars in Thousands)

Last 10 Fiscal Years

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2008	$ 144,548	$ 87,023	$ 57,525	$ 703,701	12.37%
2009	$ 140,591	$ 101,548	$ 39,043	$ 733,164	13.85
2010	$ 150,220	$ 107,066	$ 43,154	$ 740,101	14.47
2011	$ 124,284	$ 109,604	$ 14,680	$ 775,806	14.13
2012	$ 152,369	$ 121,891	$ 30,478	$ 794,417	15.34
2013	$ 189,254	$ 125,995	$ 63,259	$ 796,188	15.82
2014	$ 163,985	$ 141,632	$ 22,353	$ 820,333	17.27
2015	$ 197,325	$ 153,317	$ 44,008	$ 845,076	18.14
2016	$ 189,375	$ 165,065	$ 24,310	$ 881,222	18.73
2017	$ 165,252	$ 175,329	$ (10,077)	$ 944,296	18.57

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Contribution Rates for Fiscal Year Ending June 30, 2017:

Valuation Date:	June 30, 2016
Notes	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.
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	25 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Payroll Growth	3.50%
Salary Increases	4.25% to 12.75% including inflation
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 2011 valuation pursuant to an experience study of the period 2004 - 2009, prepared by a former actuary.
Mortality	RP-2000 employee and annuitant generational mortality table, projected with scale AA, white collar adjustment.

Other Information:

Notes	The plan is assumed to pay a 2.50% post retirement benefit increase beginning January 1, 2051. See separate funding report as of July 1, 2016 for additional detail.

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

FY Ending June 30,	Annual Return[1]
2008	
2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	

[1] *Annual money-weighted rate of return, net of investment expenses.*

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

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 a geometric, long-term expected rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each major asset class that is included in the pension fund's target asset allocation as of June 30, 2017, these best estimates are summarized in the following table:

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%	7.50%
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 PERA for GASB compliance purposes. PERA 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.

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% and the municipal bond rate of 3.56%. The projection of cash flows used to determine this single discount rate assumed that plan member and employer contributions will be made at the current statutory rates. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 7.50%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

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	$ 10,461,547	$ 9,268,998	$ 8,284,483
Net Position Restricted for Pensions	$ 7,918,879	$ 7,918,879	$ 7,918,879
Net Pension Liability	**$ 2,542,668**	**$ 1,350,119**	**$ 365,604**

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)
Current Reporting Period

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Current Period Deferred Outflows	Current Period Deferred Inflows	Current Period Pension Expense*
Balance Beginning of Year	**$ 11,111,264**	**$ 7,098,090**	**$ 4,013,174**			
Changes for the Year:						
Service Cost	$ 318,401		$ 318,401			$ 318,401
Interest on Total Pension Liability	$ 616,740		$ 616,740			$ 616,740
Interest on Fiduciary Net Position		$ 523,426	$ (523,426)			$ (523,426)
Changes in Benefit Terms						
Liability Experience Gains and Losses	$ 37,292		$ 37,292	$ 31,077	$ -	$ 6,215
Changes in Assumptions	$ (2,300,201)		$ (2,300,201)	$ -	$ 1,916,834	$ (383,367)
Contributions - Employer		$ 175,329	$ (175,329)			
Contributions - Employees		$ 101,984	$ (101,984)			$ (101,984)
Asset Gain/(Loss)		$ 535,516	$ (535,516)	$ -	$ 428,413	$ (107,103)
Benefit Payouts	$ (514,498)	$ (514,498)				
Administrative Expenses		$ (992)	$ 992			$ 992
Other		$ 24	$ (24)			$ (24)
Net Changes	**$ (1,842,266)**	**$ 820,789**	**$ (2,663,055)**	**$ 31,077**	**$ 2,345,247**	**$ (173,556)**
Balance End of Year	**$ 9,268,998**	**$ 7,918,879**	**$ 1,350,119**			

** Pension Expense from Experience in the Current Reporting Period.*

GASB Statement No. 68 Reconciliation (Dollars in Thousands)
Current and Prior Reporting Periods

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Net Deferred Outflows Prior Year	Total Pension Expense*
Balance Beginning of Year	**$ 11,111,264**	**$ 7,098,090**	**$ 4,013,174**				
Changes for the Year:							
Service Cost	$ 318,401		$ 318,401				$ 318,401
Interest on Total Pension Liability	$ 616,740		$ 616,740				$ 616,740
Interest on Fiduciary Net Position		$ 523,426	$ (523,426)				$ (523,426)
Changes in Benefit Terms							
Liability Experience Gains and Losses	$ 37,292		$ 37,292	$ 31,682	$ 360,939	$ (459,480)	$ (92,931)
Changes in Assumptions	$ (2,300,201)		$ (2,300,201)	$ 1,874,881	$ 1,916,834	$ 2,370,597	$ 112,349
Contributions - Employer		$ 175,329	$ (175,329)				
Contributions - Employees		$ 101,984	$ (101,984)				$ (101,984)
Asset Gain/(Loss)		$ 535,516	$ (535,516)	$ 446,957	$ 561,646	$ 345,974	$ (74,853)
Benefit Payouts	$ (514,498)	$ (514,498)					
Administrative Expenses		$ (992)	$ 992				$ 992
Other		$ 24	$ (24)				$ (24)
Net Changes	**$ (1,842,266)**	**$ 820,789**	**$ (2,663,055)**				**$ 255,264**
Balance End of Year	**$ 9,268,998**	**$ 7,918,879**	**$ 1,350,119**	**$ 2,353,520**	**$ 2,839,419**	**$ 2,257,091**	

** Pension Expense from Experience in the Current Reporting Period.*

Summary of Population Statistics

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2016	**11,398**	**1,490**	**1,059**	**7,222**	**1,257**	**1,873**	**24,299**
New members	656						656
Return to active	45	(24)	(21)	0	0	0	0
Terminated non-vested	(88)	0	88	0	0	0	0
Service retirements	(245)	(95)	0	340	0	0	0
Terminated deferred	(153)	153	0	0	0	0	0
Terminated refund/transfer	(30)	(28)	(14)	0	0	0	(72)
Deaths	(7)	(1)	(3)	(152)	(15)	(98)	(276)
New beneficiary	0	0	0	0	0	104	104
Disabled	(55)	0	0	0	55	0	0
Data adjustments	1	11	25	(2)	13	(18)	30
Net change	124	16	75	186	53	(12)	442
Members on 6/30/2017	**11,522**	**1,506**	**1,134**	**7,408**	**1,310**	**1,861**	**24,741**

SECTION E

SUMMARY OF BENEFITS

Summary of Plan Provisions – Police & Fire Plan

Following is a summary of the major plan provisions used in the valuation of this report. PERA 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	All full-time and certain part-time police officers and fire fighters, and certain paramedics, who are not contributing to any other local retirement fund.
Contributions	<u>Member</u> / <u>Employer</u> Percent of Salary January 1, 2015 & later: 10.80 / 16.20 Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
State contributions	$9 million paid annually on October 1 until both PERA P&F and MSRS State Patrol become 90% funded (on a Market Value of Assets basis).
Allowable service	Police and Fire service during which member contributions were made. May also include certain leaves of absence and military service.
Salary	Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage.
Average salary	Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years.
Vesting	

Years of Service	Vesting Percent if First Hired: Before 7/1/2010	After 6/30/2010 & before 7/1/2014	After 6/30/2014
<3	0%	0%	0%
3 – 4	100	0	0
5	100	50	0
6	100	60	0
7	100	70	0
8	100	80	0
9	100	90	0
10	100	100	50
11	100	100	55
12	100	100	60
13	100	100	65
14	100	100	70
15	100	100	75
16	100	100	80
17	100	100	85
18	100	100	90
19	100	100	95
20+	100	100	100

Summary of Plan Provisions – Police & Fire Plan (Continued)

Retirement	
Normal retirement benefit	
Age/service requirement	Age 55 and at least partially vested. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.
Amount	3.00% of Average Salary for each year of Allowable Service (up to 33 years if hired after June 30, 2014), pro-rata for completed months. A pro-rata share of member contributions will be refunded at retirement for excess service.
Early retirement	
Age/service requirement	Age 50 and at least partially vested.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date and 0.10% (0.20% for members enrolled in the plan after June 30, 2007) reduction for each month the member is under age 55. If the effective date of retirement is after June 30, 2019, the reduction is 5/12% for each month that the member is under age 55 at the time of retirement. The change in early retirement factors will be phased-in over a five-year period for retirements occurring between July 1, 2014 and June 30, 2019.
Form of payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 25%, 50%, 75% or 100% Joint and Survivor with bounce back feature. The Joint and Survivor options are determined on an actuarially equivalent basis, but with no actuarial reduction for the bounce back feature.
Benefit Increases	Benefit recipients receive a future annual 1.00% post-retirement benefit increase. The annual adjustment will equal 2.50% any time the Fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.50% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.00%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. For retirements after May 31, 2014, the first increase will be delayed two years. Members retired under laws in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is the greater of $25 times each full year of Allowable Service or the difference between $400 times each full year of Allowable Service and the sum of benefits paid from any Minnesota public pension plan plus cash payments from the Social Security Administration for the preceding fiscal year July 1, 1988 through June 30, 1989. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from the Fund. Effective January 1, 2002, annual lump sum payment is divided by 12 and paid as a monthly life annuity in the annuity form elected.

Summary of Plan Provisions – Police & Fire Plan (Continued)

Disability

Duty disability benefit

Age/service requirement	Physically or mentally unable to perform normal duties as a police officer or fire fighter as a direct result of an act of duty specific to protecting property and personal safety of others. Members age 55 or older with 20 or more years of Allowable Service are not eligible to apply for duty disability benefits.
Amount	60.0%, plus an additional 3.00% for each year of service in excess of 20 years, of Average Salary paid until Normal Retirement Age, or for 60 months, whichever is later. The retirement benefit is then recalculated but is never lower than the disability benefit. If a member became disabled prior to July 1, 1997 but did not commence their benefit before July 1, 1997, the benefit is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in post-retirement interest rates from 5.00% to 6.00%.

Regular disability benefit

Age/service requirement	Physically or mentally unable to perform normal duties as a police officer or fire fighter with one year of Allowable Service. Members age 55 or older with 15 or more years of Allowable Service are not eligible to apply for regular disability benefits.
Amount	45.00% of Average Salary, paid until Normal Retirement Age, or for 60 months, whichever is later. The retirement benefit is then recalculated but is never lower than the disability benefit. Benefits for total and permanent regular disability are calculated as 3.00% of Average Salary for each year of Allowable Service, with a minimum of 45.00% of Average Salary. If a member became disabled prior to July 1, 1997 but did not commence his or her benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.

Retirement benefit

Age/service requirement	Upon cessation of disability benefits.
Amount	Any optional annuity continues. Otherwise, the larger of the disability benefit paid before age 55 or the normal retirement benefit available at age 55, or an actuarially equivalent optional annuity.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.

Death

Surviving spouse benefit

Age/service requirement	Death of active member or regular disabled member with surviving spouse whose disability benefit accrued before July 1, 2007, who is vested at death (service requirement is waived if death occurs in the line of duty).
Amount	50.00% of salary (60.00% if death occurs in the line of duty after June 30, 2007) averaged over last six months. Benefit paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991. If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.

Surviving dependent children's benefit

Age/service requirement	Non-duty related death of active member or regular disabled member with eligible dependent child.
Amount	10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 50.00% of salary and maximum of 70.00% of salary. Benefits paid until child marries, dies, or attains age 18 (age 23 if full-time student).

Duty disability surviving spouse benefit

Age/service requirement	Member who is totally and permanently disabled who dies before age 55 or within five years of the effective date of the disability benefit, whichever is later.
Amount	60.00% of salary averaged over last six months. Benefits paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991.
Benefit increases	Same as for retirement.

Death (Continued)

<u>Duty disability surviving dependent children's benefit</u>

Age/service requirement	Death of a member with an eligible dependent child who was disabled in the line of duty and died as a direct result of the disability.
Amount	10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 60.00% of salary and maximum of 80.00% of salary. Benefits paid until child marries, dies, or attains age 18 (age 23 if full-time student). If a member became deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.

<u>Surviving spouse optional annuity</u>

Age/service requirement	Active member dies before age 55. Benefits commence when member would have been age 55 or as early as age 50 if qualified for early retirement, benefits commence immediately if member had 30 years of service.
Amount	Survivor's payment of the 100% joint and survivor benefit the member could have elected if terminated. Alternatively, spouse may elect refund of deceased's contributions with interest if there are no dependent children. If a member became deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit increases	Same as for retirement.

Summary of Plan Provisions – Police & Fire Plan (Continued)

Termination	
<u>Refund of contributions</u>	
Age/service requirement	Termination of public service.
Amount	If member terminated before July 1, 2011, member's contributions credited with 6% interest compounded annually prior to July 1, 2011 and 4% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually. A deferred annuity may be elected in lieu of a refund if vested.
<u>Deferred benefit</u>	
Age/service requirement	Partially or fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following percentage (augmentation) compounded annually for terminations prior to 2012: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (d.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; and (e.) 1.00% from January 1, 2012 thereafter. Members who terminate after 2011 will receive no future augmentation. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and 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 2027 using scale AA, no setbacks, blended 90% males, and 7.00% post-retirement interest. The post-retirement interest rate assumption will change to 6.5% on the earlier of the effective date of the next mortality adjustment or July 1, 2017.

Summary of Plan Provisions – Police & Fire Plan (Concluded)

Combined service annuity	Members are eligible for combined service benefits if they: (a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or (b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010). Other requirements for combined service include: (a.) Member must have at least six months of allowable service credit in each plan worked under; and (b.) Member may not be in receipt of a benefit from another plan. Members who meet the above requirements must have their benefit based on the following: (a.) Allowable service in all covered plans is combined in order to determine eligibility for early retirement. (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Changes in plan provisions	There have been no changes in plan provisions since the previous valuation.

Summary of Plan Provisions – Minneapolis Police Relief Association

Normal retirement benefit	Monthly benefits are equal to the number of units multiplied by the unit values described herein. Units are based on service, as follows: **Service** / **Units** 20 — 35.0 units 21 — 36.6 units 22 — 38.2 units 23 — 39.8 units 24 — 41.4 units 25 or more — 43.0 units Members must be at least age 50 with 5 years of service to receive this benefit.
Unit values	**Calendar Year** / **Unit Value** 2012 — $ 104.651 2013 — 109.011 2014 — 114.825 2015 — 124.031 Unit values after 2015 are assumed to increase the same percentage as the post-retirement benefit increase.
Surviving spouse's benefit	Annual benefit based on 23 units for the surviving spouse of an active or retired member. Upon retirement, members may choose an alternative form of payment that provides 50%, 75%, or 100% of their benefit to their spouse after their death. The units are adjusted if one of these alternate forms is selected.
Surviving children's benefit	Annual benefit based on 8 units for each surviving child of an active or retired member. Benefits continue to age 18 or if the child is a full-time student, to age 22. The total benefit for surviving children and spouse combined is limited to 41 units.
Contributions	Member and employer contributions equal to 8.00% of the monthly unit value multiplied by 80 are required for each member. After 25 years of service, member contributions are paid to a separate health insurance account.
Benefit increases	Benefit recipients receive a future annual 1.00% post-retirement benefit increase. The annual adjustment will equal 2.50% any time the Fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.50% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.00%.

Summary of Plan Provisions – Minneapolis Firefighters' Relief Association

Normal retirement benefit	Monthly benefits are equal to the number of units multiplied by the unit values described herein. Units are based on service, as follows: **Service** / **Units** 15 / 25.0 units 16 / 26.6 units 17 / 28.2 units 18 / 29.8 units 19 / 31.4 units 20 / 35.0 units 21 / 36.6 units 22 / 38.2 units 23 / 39.8 units 24 / 41.4 units 25 or more / 43.0 units Members must be at least age 50 with 5 years of service to receive this benefit. Members may choose among alternative survivor payment forms which modify the number of units payable to the member and their spouse. A member who is single at the time of retirement and who has at least 25 years of service may choose to receive 43.3 units on the condition of a reduced survivor payment to any future spouse.
Unit values	**Calendar Year** / **Unit Value** 2013 / 100.775 2014 / 104.264 2015 / 124.031 Unit values after 2015 are assumed to increase the same percentage as the post-retirement benefit increase.
Disability benefit	Annual benefit based on 41 units for the disabled member.
Surviving spouse's benefit	Annual benefit based on 23 units for the surviving spouse of an active or retired member and 22 units for the surviving spouse of a disabled member. Upon retirement, members may choose an alternative form of payment that provides 50%, 75% or 100% of their benefit to their spouse after their death. The units are adjusted if one of these alternate forms is selected.
Surviving children's benefit	Annual benefit based on 8 units for each surviving child of an active or retired member. Benefits continue to age 18 or if the child is a full-time student, to age 22. The total benefit for surviving children and spouse combined is limited to 43 units.
Contributions	Member and employer contributions equal to 8.00% of the monthly unit value multiplied by 80 are required for each member. After 25 years of service, member contributions are paid to a separate health insurance account.
Benefit increases	Benefit recipients receive a future annual 1.00% post-retirement benefit increase. The annual adjustment will equal 2.50% any time the Fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.50% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.00%.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED RATIOS

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 1.00% post-retirement benefit increase. If the funding ratio reaches 90% (based on a 2.50% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.

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 (rate of 12.50% at year 1 declining to 3.50% at years 25 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 1.00% per year until the funding ratio threshold required to pay a 2.50% postretirement benefit increase is reached
- Current statutory contributions (i.e., not including potential contribution increases under the contribution stabilizer statutes) as directed by PERA

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay a 2.50% postretirement benefit increase in 2064. A 1.00% postretirement benefit increase assumption through 2064 and a 2.5% postretirement benefit increase thereafter are assumed in our calculations.

Asset Valuation Method

Fair value of assets.

Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. The assumptions are based on the last experience study dated August 30, 2016, reviews of inflation and investment assumptions, dated September 11, 2014 and September 11, 2017, and a recent asset liability study obtained by the State Board of Investment.

The Allowance for Combined Service Annuity assumptions are based on an analysis completed by the LCPR actuary and documented in a report dated October 2016.

Investment return	7.50% per annum.
Single Discount Rate	7.50% per annum.
Benefit increases after retirement	1.00% per annum through 2064 and 2.50% per annum thereafter.
Salary increases	Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service earned during the year.
Inflation	2.50% per year.
Payroll growth	3.25% per year.
Mortality rates	
Healthy pre-retirement	RP-2014 employee generational mortality table projected with mortality improvement scale MP-2016, from a base year of 2006.
Healthy post-retirement	RP-2014 annuitant generational mortality table projected with mortality improvement scale MP-2016 from a base year of 2006. Male rates are adjusted by a factor of 0.96.
Disabled	RP-2014 annuitant generational mortality table projected with mortality improvement scale MP-2016 from a base year of 2006. Male rates are adjusted by a factor of 0.96. 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	Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are:

Year	Select Withdrawal Rates
1	3.00%
2	3.00%
3	3.00%

Summary of Actuarial Assumptions (Continued)

Disability	Age-related rates based on experience; see table of sample rates. All incidences are assumed to be duty-related.
Allowance for combined service annuity	Liabilities for former members are increased by 33.0% for vested members and 2.0% for non-vested members to account for the effect of some participants having eligibility for a Combined Service Annuity.
Administrative expenses	In the valuation year, equal to prior year administrative expenses expressed as 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 accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 55.
Percentage married	85% of male and 60% of female active members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Males are assumed to be two years older than females. For members in payment status, actual spouse date of birth is used, if provided.
Eligible children	Retiring members are assumed to have no dependent children.
Form of payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 10% elect 25% Joint & Survivor option 20% elect 50% Joint & Survivor option 20% elect 75% Joint & Survivor option 35% elect 100% Joint & Survivor option Females: 20% elect 25% Joint & Survivor option 20% elect 50% Joint & Survivor option 10% elect 75% Joint & Survivor option 20% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option. Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service 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.

Summary of Actuarial Assumptions (Continued)

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 33 members reported with a salary less than $100. We used prior year salary (19 members), if available; otherwise high five salary with a 10% load to account for salary increases (14 members). If neither prior year salary nor high five salary was available, we assumed a value of $35,000. Note former members of either Minneapolis Police or Minneapolis Fire are excluded from these salary counts as salary is not used to calculate the benefit. There were also 123 members reported without a gender. We assumed male gender. There were 2 members reported without a date of birth. We assumed a date of birth of July 1, 1985. <u>Data for terminated members:</u> We calculated benefits for these members using the reported Average Salary and credited service. If Average Salary was not reported (2 members), we assumed a value of $24,000. If credited service was not reported (15 members), we used elapsed time from hire date to termination date (6 members); otherwise we assumed nine years of service. If termination date was invalid or not reported (8 members), we assumed the termination date was equal to the hire date plus credited service, otherwise the valuation date. If the reported termination date occurs prior to the reported hire date, the two dates were swapped. There were 6 members reported without a gender; male was assumed. There were no members reported without a date of birth. <u>Data for retired members:</u> There were no members with missing or invalid dates of birth. There were 20 members reported without a gender. We assumed retirees are male and beneficiaries are female. There were 20 members that were active last year, and retirement eligible, and not on the retiree data file this year. At the direction of PERA, we included these members in the 2017 valuation as retirees with an estimated life only monthly benefit.

Summary of Actuarial Assumptions (Continued)

Unknown data for certain members (Continued)	Data for retired members (Continued): Because PERA reclassifies disabled members as retirees once the member reaches Normal Retirement Age, we compare the members that PERA reports as retirees to our disabled group from the last valuation. If a member was disabled in the valuation, we reclassify that member as a disabled retiree in this year's valuation. We reclassified 192 retirees as disabled retirees in this valuation.
Changes in actuarial assumptions	Assumed salary increases were changed as recommended in the June 30, 2016 experience study. The net effect is proposed rates that average 0.34% lower than the previous rates. Assumed rates of retirement were changed, resulting in fewer retirements. The Combined Service Annuity (CSA) load was 30% for vested and non-vested, deferred members. The CSA has been changed to 33% for vested members and 2% for non-vested members. The base mortality table for healthy annuitants was changed from the RP-2000 fully generational table to the RP-2014 fully generational table (with a base year of 2006), with male rates adjusted by a factor of 0.96. The mortality improvement scale was changed from Scale AA to Scale MP-2016. The base mortality table for disabled annuitants was changed from the RP-2000 disabled mortality table to the mortality tables assumed for healthy retirees. Assumed termination rates were decreased to 3.0% for the first three years of service. Rates beyond the select period of three years were adjusted, resulting in more expected terminations overall. Assumed percentage of married female members was decreased from 65% to 60%. Assumed age difference was changed from separate assumptions for male members (wives assumed to be three years younger) and female members (husbands assumed to be four years older) to the assumption that males are two years older than females. The assumed percentage of female members electing Joint and Survivor annuities was increased. The assumed post-retirement benefit increase rate was changed from 1.00% for all years to 1.00% per year through 2064 and 2.50% thereafter. For accounting purposes, this change was treated as a difference between expected and actual experience. The Single Discount Rate changed from 5.60% per annum to 7.50% per annum.

Summary of Actuarial Assumptions (Continued)

Age in 2017	Percentage of Members Dying Each Year* — Healthy Post-Retirement Mortality — Males	Females	Healthy Pre-Retirement Mortality — Males	Females	Disability Mortality — Males	Females
20	0.03%	0.02%	0.04%	0.02%	0.03%	0.02%
25	0.05	0.03	0.05	0.02	0.05	0.03
30	0.08	0.06	0.05	0.02	0.08	0.06
35	0.12	0.11	0.06	0.03	0.12	0.11
40	0.18	0.17	0.07	0.04	0.18	0.17
45	0.26	0.21	0.10	0.07	0.26	0.21
50	0.39	0.27	0.17	0.11	0.39	0.27
55	0.55	0.38	0.28	0.17	0.55	0.38
60	0.77	0.56	0.48	0.26	0.77	0.56
65	1.10	0.84	0.86	0.39	1.10	0.84
70	1.65	1.31	1.42	0.64	1.65	1.31

* *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.*

Age	Withdrawal Rates After Third Year — Males	Females	Disability Retirement — Males	Females
20	3.00%	3.00%	0.11%	0.11%
25	2.60	2.60	0.13	0.13
30	2.10	2.10	0.16	0.16
35	1.60	1.60	0.19	0.19
40	1.25	1.25	0.29	0.29
45	1.25	1.25	0.54	0.54
50	0.00	0.00	1.04	1.04
55	0.00	0.00	2.03	2.03
60	0.00	0.00	0.00	0.00

Summary of Actuarial Assumptions (Concluded)

Age	Retirement Rate	Salary Scale Year	Salary Scale Increase
50	10.00%	1	12.25%
51	7.00	2	10.50%
52	7.00	3	8.75%
53	10.00	4	7.75%
54	10.00	5	6.25%
55	25.00	6	5.75%
56	22.50	7	5.25%
57	22.50	8	5.00%
58	22.50	9	4.75%
59	20.00	10	4.50%
60	22.50	11	4.25%
61	25.00	12	4.15%
62	30.00	13	4.05%
63	30.00	14	3.95%
64	30.00	15	3.85%
65	50.00	16	3.75%
66	50.00	17	3.75%
67	50.00	18	3.75%
68	50.00	19	3.75%
69	50.00	20	3.75%
70+	100.00	21	3.65%
		22	3.55%
		23	3.45%
		24	3.35%
		25+	3.25%

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 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 assumed long-term rate of return is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a “risk-free” rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%, the municipal bond rate is 3.56%; and **the resulting single discount rate 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 (SDR). 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)

	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*	Contributions due from Mergers	Additional State Contributions	Total Contributions
2017	$ 944,296	$ 0	$ 944,296						
2018	957,928	0	957,928	$ 103,456	$ 155,184	$ 0	$ 13,677	$ 9,000	$ 281,317
2019	953,047	36,014	989,061	102,929	154,394	2,046	13,677	9,000	282,046
2020	944,010	77,195	1,021,205	101,953	152,930	4,385	13,677	9,000	281,945
2021	931,225	123,170	1,054,395	100,572	150,858	6,996	13,677	9,000	281,103
2022	914,731	173,931	1,088,662	98,791	148,186	9,879	13,648	9,000	279,504
2023	895,368	228,676	1,124,044	96,700	145,050	12,989	13,648	9,000	277,387
2024	873,764	286,811	1,160,575	94,366	141,550	16,291	13,648	9,000	274,855
2025	849,998	348,296	1,198,294	91,800	137,700	19,783	13,648	9,000	271,931
2026	824,162	413,077	1,237,239	89,009	133,514	23,463	13,648	9,000	268,634
2027	796,679	480,770	1,277,449	86,041	129,062	27,308	13,648	9,000	265,059
2028	767,789	551,177	1,318,966	82,921	124,382	31,307	13,648	9,000	261,258
2029	738,058	623,774	1,361,832	79,710	119,565	35,430	13,648	9,000	257,353
2030	707,436	698,656	1,406,092	76,403	114,605	39,684	13,648	9,000	253,340
2031	675,517	776,273	1,451,790	72,956	109,434	44,092	13,648	9,000	249,130
2032	642,530	856,443	1,498,973	69,393	104,090	48,646	13,648	9,000	244,777
2033	608,288	939,402	1,547,690	65,695	98,543	53,358	0	9,000	226,596
2034	572,861	1,025,129	1,597,990	61,869	92,804	58,227	0	9,000	221,900
2035	536,252	1,113,672	1,649,924	57,915	86,873	63,257	0	9,000	217,045
2036	498,513	1,205,034	1,703,547	53,839	80,759	68,446	0	9,000	212,044
2037	459,930	1,298,982	1,758,912	49,672	74,509	73,782	0	9,000	206,963
2038	420,807	1,395,270	1,816,077	45,447	68,171	79,251	0	9,000	201,869
2039	381,658	1,493,441	1,875,099	41,219	61,829	84,827	0	9,000	196,875
2040	342,679	1,593,361	1,936,040	37,009	55,514	90,503	0	9,000	192,026
2041	304,341	1,694,620	1,998,961	32,869	49,303	96,254	0	9,000	187,426
2042	267,237	1,796,690	2,063,927	28,862	43,292	102,052	0	9,000	183,206
2043	231,877	1,899,128	2,131,005	25,043	37,564	107,870	0	9,000	179,477
2044	198,736	2,001,527	2,200,263	21,463	32,195	113,687	0	9,000	176,345
2045	167,845	2,103,926	2,271,771	18,127	27,191	119,503	0	9,000	173,821
2046	139,447	2,206,157	2,345,604	15,060	22,590	125,310	0	9,000	171,960
2047	113,762	2,308,074	2,421,836	12,286	18,430	131,099	0	9,000	170,815
2048	90,978	2,409,568	2,500,546	9,826	14,738	136,863	0	9,000	170,427
2049	71,434	2,510,379	2,581,813	7,715	11,572	142,590	0	9,000	170,877
2050	55,142	2,610,580	2,665,722	5,955	8,933	148,281	0	9,000	172,169
2051	41,992	2,710,366	2,752,358	4,535	6,803	153,949	0	9,000	174,287
2052	31,599	2,810,211	2,841,810	3,413	5,119	159,620	0	9,000	177,152
2053	23,417	2,910,752	2,934,169	2,529	3,794	165,331	0	9,000	180,654
2054	17,012	3,012,517	3,029,529	1,837	2,756	171,111	0	9,000	184,704
2055	12,015	3,115,974	3,127,989	1,298	1,946	176,987	0	9,000	189,231
2056	8,186	3,221,463	3,229,649	884	1,326	182,979	0	9,000	194,189
2057	5,340	3,329,272	3,334,612	577	865	189,103	0	9,000	199,545
2058	3,310	3,439,677	3,442,987	358	536	195,374	0	9,000	205,268
2059	1,940	3,552,944	3,554,884	209	314	201,807	0	9,000	211,330
2060	1,061	3,669,357	3,670,418	115	172	208,419	0	9,000	217,706
2061	541	3,789,165	3,789,706	58	88	215,225	0	9,000	224,371
2062	261	3,912,611	3,912,872	28	42	222,236	0	9,000	231,306
2063	118	4,039,922	4,040,040	13	19	229,468	0	9,000	238,500
2064	49	4,171,293	4,171,342	5	8	236,929	0	9,000	245,942
2065	17	4,306,893	4,306,910	2	3	244,632	0	9,000	253,637
2066	5	4,446,880	4,446,885	1	1	252,583	0	0	252,585
2067	2	4,591,407	4,591,409	0	-	260,792	0	0	260,792

**Contributions related to future employees in excess of normal cost and expenses of 21.32% of pay.*

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

	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*	Contributions due from Mergers	Additional State Contributions	Total Contributions
2068	$ 1	$ 4,740,628	$ 4,740,629	$ 0	$ 0	$ 269,268	$ 0	$ 0	$ 269,268
2069	0	4,894,700	4,894,700	0	0	278,019	0	0	278,019
2070	0	5,053,778	5,053,778	0	0	287,055	0	0	287,055
2071	0	5,218,025	5,218,025	0	0	296,384	0	0	296,384
2072	0	5,387,611	5,387,611	0	0	306,016	0	0	306,016
2073	0	5,562,708	5,562,708	0	0	315,962	0	0	315,962
2074	0	5,743,496	5,743,496	0	0	326,231	0	0	326,231
2075	0	5,930,160	5,930,160	0	0	336,833	0	0	336,833
2076	0	6,122,890	6,122,890	0	0	347,780	0	0	347,780
2077	0	6,321,884	6,321,884	0	0	359,083	0	0	359,083
2078	0	6,527,346	6,527,346	0	0	370,753	0	0	370,753
2079	0	6,739,484	6,739,484	0	0	382,803	0	0	382,803
2080	0	6,958,517	6,958,517	0	0	395,244	0	0	395,244
2081	0	7,184,669	7,184,669	0	0	408,089	0	0	408,089
2082	0	7,418,171	7,418,171	0	0	421,352	0	0	421,352
2083	0	7,659,262	7,659,262	0	0	435,046	0	0	435,046
2084	0	7,908,188	7,908,188	0	0	449,185	0	0	449,185
2085	0	8,165,204	8,165,204	0	0	463,784	0	0	463,784
2086	0	8,430,573	8,430,573	0	0	478,857	0	0	478,857
2087	0	8,704,566	8,704,566	0	0	494,419	0	0	494,419
2088	0	8,987,465	8,987,465	0	0	510,488	0	0	510,488
2089	0	9,279,557	9,279,557	0	0	527,079	0	0	527,079
2090	0	9,581,143	9,581,143	0	0	544,209	0	0	544,209
2091	0	9,892,530	9,892,530	0	0	561,896	0	0	561,896
2092	0	10,214,037	10,214,037	0	0	580,157	0	0	580,157
2093	0	10,545,994	10,545,994	0	0	599,012	0	0	599,012
2094	0	10,888,738	10,888,738	0	0	618,480	0	0	618,480
2095	0	11,242,622	11,242,622	0	0	638,581	0	0	638,581
2096	0	11,608,008	11,608,008	0	0	659,335	0	0	659,335
2097	0	11,985,268	11,985,268	0	0	680,763	0	0	680,763
2098	0	12,374,789	12,374,789	0	0	702,888	0	0	702,888
2099	0	12,776,970	12,776,970	0	0	725,732	0	0	725,732
2100	0	13,192,221	13,192,221	0	0	749,318	0	0	749,318
2101	0	13,620,969	13,620,969	0	0	773,671	0	0	773,671
2102	0	14,063,650	14,063,650	0	0	798,815	0	0	798,815
2103	0	14,520,719	14,520,719	0	0	824,777	0	0	824,777
2104	0	14,992,642	14,992,642	0	0	851,582	0	0	851,582
2105	0	15,479,903	15,479,903	0	0	879,258	0	0	879,258
2106	0	15,983,000	15,983,000	0	0	907,834	0	0	907,834
2107	0	16,502,447	16,502,447	0	0	937,339	0	0	937,339
2108	0	17,038,777	17,038,777	0	0	967,803	0	0	967,803
2109	0	17,592,537	17,592,537	0	0	999,256	0	0	999,256
2110	0	18,164,294	18,164,294	0	0	1,031,732	0	0	1,031,732
2111	0	18,754,634	18,754,634	0	0	1,065,263	0	0	1,065,263
2112	0	19,364,160	19,364,160	0	0	1,099,884	0	0	1,099,884
2113	0	19,993,495	19,993,495	0	0	1,135,631	0	0	1,135,631
2114	0	20,643,283	20,643,283	0	0	1,172,538	0	0	1,172,538
2115	0	21,314,190	21,314,190	0	0	1,210,646	0	0	1,210,646
2116	0	22,006,901	22,006,901	0	0	1,249,992	0	0	1,249,992
2117	0	22,722,126	22,722,126	0	0	1,290,617	0	0	1,290,617

**Contributions related to future employees in excess of normal cost and expenses of 21.32%of pay.*

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

Fiscal Year Ending	Projected Beginning Plan 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	$ 7,918,879	$ 281,318	$ 537,914	$ 1,054	$ 584,429	$ 8,245,658
2019	8,245,658	282,046	556,072	1,048	608,296	8,578,880
2020	8,578,880	281,945	575,483	1,038	632,569	8,916,873
2021	8,916,873	281,104	595,797	1,024	657,140	9,258,296
2022	9,258,296	279,504	617,943	1,006	681,873	9,600,724
2023	9,600,724	277,386	642,002	985	706,592	9,941,715
2024	9,941,715	274,855	667,542	961	731,133	10,279,200
2025	10,279,200	271,930	694,354	935	755,351	10,611,192
2026	10,611,192	268,634	722,572	907	779,091	10,935,438
2027	10,935,438	265,059	751,563	876	802,211	11,250,269
2028	11,250,269	261,258	780,756	845	824,610	11,554,536
2029	11,554,536	257,354	809,590	812	846,226	11,847,714
2030	11,847,714	253,339	838,619	778	866,998	12,128,654
2031	12,128,654	249,130	867,912	743	886,837	12,395,966
2032	12,395,966	244,777	897,105	707	905,651	12,648,582
2033	12,648,582	226,596	926,431	669	922,849	12,870,927
2034	12,870,927	221,900	955,690	630	938,276	13,074,783
2035	13,074,783	217,045	985,415	590	952,294	13,258,117
2036	13,258,117	212,044	1,015,546	548	964,752	13,418,819
2037	13,418,819	206,963	1,045,358	506	975,521	13,555,439
2038	13,555,439	201,869	1,074,943	463	984,492	13,666,394
2039	13,666,394	196,875	1,103,918	420	991,565	13,750,496
2040	13,750,496	192,026	1,132,077	377	996,659	13,806,727
2041	13,806,727	187,426	1,158,765	335	999,725	13,834,778
2042	13,834,778	183,206	1,183,673	294	1,000,758	13,834,775
2043	13,834,775	179,477	1,206,179	255	999,793	13,807,611
2044	13,807,611	176,345	1,226,091	219	996,909	13,754,555
2045	13,754,555	173,821	1,243,747	185	992,188	13,676,632
2046	13,676,632	171,960	1,258,846	153	985,721	13,575,314
2047	13,575,314	170,814	1,271,019	125	977,632	13,452,616
2048	13,452,616	170,427	1,279,716	100	968,096	13,311,323
2049	13,311,323	170,877	1,284,262	79	957,349	13,155,208
2050	13,155,208	172,169	1,284,521	61	945,680	12,988,475
2051	12,988,475	174,287	1,280,382	46	933,406	12,815,740
2052	12,815,740	177,152	1,272,352	35	920,852	12,641,357
2053	12,641,357	180,653	1,261,172	26	908,314	12,469,126
2054	12,469,126	184,704	1,247,252	19	896,059	12,302,618
2055	12,302,618	189,231	1,230,913	13	884,339	12,145,262
2056	12,145,262	194,189	1,212,303	9	873,406	12,000,545
2057	12,000,545	199,545	1,191,530	6	863,514	11,872,068
2058	11,872,068	205,267	1,168,743	4	854,928	11,763,516
2059	11,763,516	211,331	1,144,076	2	847,918	11,678,687
2060	11,678,687	217,706	1,117,692	1	842,762	11,621,462
2061	11,621,462	224,371	1,089,731	1	839,746	11,595,847
2062	11,595,847	231,307	1,060,341	0	839,162	11,605,975
2063	11,605,975	238,499	1,029,666	0	841,316	11,656,124
2064	11,656,124	245,943	997,820	0	846,524	11,750,771
2065	11,750,771	253,636	972,063	0	854,854	11,887,198
2066	11,887,198	252,584	951,836	0	865,792	12,053,738
2067	12,053,738	260,792	929,877	0	879,394	12,264,047

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 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	$ 12,264,047	$ 269,268	$ 906,222	$ 0	$ 896,350	$ 12,523,443
2069	12,523,443	278,019	880,912	0	917,059	12,837,609
2070	12,837,609	287,055	853,995	0	941,945	13,212,614
2071	13,212,614	296,384	825,532	0	971,462	13,654,928
2072	13,654,928	306,016	795,594	0	1,006,092	14,171,442
2073	14,171,442	315,962	764,263	0	1,046,351	14,769,492
2074	14,769,492	326,231	731,631	0	1,092,784	15,456,876
2075	15,456,876	336,833	697,808	0	1,145,974	16,241,875
2076	16,241,875	347,780	662,917	0	1,206,537	17,133,275
2077	17,133,275	359,083	627,097	0	1,275,127	18,140,388
2078	18,140,388	370,753	590,505	0	1,352,438	19,273,074
2079	19,273,074	382,803	553,313	0	1,439,202	20,541,766
2080	20,541,766	395,244	515,711	0	1,536,197	21,957,496
2081	21,957,496	408,089	477,908	0	1,644,241	23,531,918
2082	23,531,918	421,352	440,134	0	1,764,202	25,277,338
2083	25,277,338	435,046	402,642	0	1,896,994	27,206,736
2084	27,206,736	449,185	365,705	0	2,043,579	29,333,795
2085	29,333,795	463,784	329,608	0	2,204,975	31,672,946
2086	31,672,946	478,857	294,640	0	2,382,254	34,239,417
2087	34,239,417	494,419	261,077	0	2,576,549	37,049,308
2088	37,049,308	510,488	229,172	0	2,789,057	40,119,681
2089	40,119,681	527,079	199,146	0	3,021,052	43,468,666
2090	43,468,666	544,209	171,181	0	3,273,886	47,115,580
2091	47,115,580	561,896	145,425	0	3,549,004	51,081,055
2092	51,081,055	580,157	121,987	0	3,847,950	55,387,175
2093	55,387,175	599,012	100,939	0	4,172,378	60,057,626
2094	60,057,626	618,480	82,307	0	4,524,065	65,117,864
2095	65,117,864	638,581	66,068	0	4,904,921	70,595,298
2096	70,595,298	659,335	52,152	0	5,317,005	76,519,486
2097	76,519,486	680,763	40,439	0	5,762,540	82,922,350
2098	82,922,350	702,888	30,770	0	6,243,925	89,838,393
2099	89,838,393	725,732	22,950	0	6,763,758	97,304,933
2100	97,304,933	749,318	16,763	0	7,324,845	105,362,333
2101	105,362,333	773,671	11,980	0	7,930,222	114,054,246
2102	114,054,246	798,815	8,371	0	8,583,175	123,427,865
2103	123,427,865	824,777	5,718	0	9,287,250	133,534,174
2104	133,534,174	851,582	3,819	0	10,046,280	144,428,217
2105	144,428,217	879,258	2,498	0	10,864,401	156,169,378
2106	156,169,378	907,834	1,604	0	11,746,073	168,821,681
2107	168,821,681	937,339	1,014	0	12,696,104	182,454,110
2108	182,454,110	967,803	636	0	13,719,672	197,140,949
2109	197,140,949	999,256	398	0	14,822,352	212,962,159
2110	212,962,159	1,031,732	251	0	16,010,143	230,003,783
2111	230,003,783	1,065,263	161	0	17,289,503	248,358,388
2112	248,358,388	1,099,884	105	0	18,667,376	268,125,543
2113	268,125,543	1,135,631	71	0	20,151,230	289,412,333
2114	289,412,333	1,172,538	50	0	21,749,099	312,333,920
2115	312,333,920	1,210,646	36	0	23,469,621	337,014,151
2116	337,014,151	1,249,992	27	0	25,322,088	363,586,204
2117	363,586,204	1,290,617	21	0	27,316,488	392,193,288

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 Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
2018	$ 7,918,879	$ 537,914	$ 537,914	$ 0	$ 518,810	$ 0	$ 518,810
2019	8,245,658	556,072	556,072	0	498,906	0	498,906
2020	8,578,879	575,483	575,483	0	480,299	0	480,299
2021	8,916,871	595,797	595,797	0	462,561	0	462,561
2022	9,258,293	617,943	617,943	0	446,283	0	446,283
2023	9,600,721	642,002	642,002	0	431,311	0	431,311
2024	9,941,711	667,542	667,542	0	417,180	0	417,180
2025	10,279,197	694,354	694,354	0	403,661	0	403,661
2026	10,611,189	722,572	722,572	0	390,759	0	390,759
2027	10,935,436	751,563	751,563	0	378,081	0	378,081
2028	11,250,267	780,756	780,756	0	365,365	0	365,365
2029	11,554,534	809,590	809,590	0	352,426	0	352,426
2030	11,847,711	838,619	838,619	0	339,593	0	339,593
2031	12,128,651	867,912	867,912	0	326,935	0	326,935
2032	12,395,963	897,105	897,105	0	314,355	0	314,355
2033	12,648,579	926,431	926,431	0	301,983	0	301,983
2034	12,870,924	955,690	955,690	0	289,786	0	289,786
2035	13,074,779	985,415	985,415	0	277,953	0	277,953
2036	13,258,114	1,015,546	1,015,546	0	266,467	0	266,467
2037	13,418,816	1,045,358	1,045,358	0	255,153	0	255,153
2038	13,555,436	1,074,943	1,074,943	0	244,069	0	244,069
2039	13,666,392	1,103,918	1,103,918	0	233,160	0	233,160
2040	13,750,494	1,132,077	1,132,077	0	222,426	0	222,426
2041	13,806,725	1,158,765	1,158,765	0	211,786	0	211,786
2042	13,834,778	1,183,673	1,183,673	0	201,245	0	201,245
2043	13,834,775	1,206,179	1,206,179	0	190,764	0	190,764
2044	13,807,612	1,226,091	1,226,091	0	180,384	0	180,384
2045	13,754,557	1,243,747	1,243,747	0	170,216	0	170,216
2046	13,676,635	1,258,846	1,258,846	0	160,262	0	160,262
2047	13,575,316	1,271,019	1,271,019	0	150,523	0	150,523
2048	13,452,618	1,279,716	1,279,716	0	140,979	0	140,979
2049	13,311,326	1,284,262	1,284,262	0	131,609	0	131,609
2050	13,155,211	1,284,521	1,284,521	0	122,452	0	122,452
2051	12,988,479	1,280,382	1,280,382	0	113,542	0	113,542
2052	12,815,743	1,272,352	1,272,352	0	104,958	0	104,958
2053	12,641,360	1,261,172	1,261,172	0	96,777	0	96,777
2054	12,469,129	1,247,252	1,247,252	0	89,032	0	89,032
2055	12,302,621	1,230,913	1,230,913	0	81,735	0	81,735
2056	12,145,266	1,212,303	1,212,303	0	74,883	0	74,883
2057	12,000,549	1,191,530	1,191,530	0	68,465	0	68,465
2058	11,872,071	1,168,743	1,168,743	0	62,471	0	62,471
2059	11,763,520	1,144,076	1,144,076	0	56,886	0	56,886
2060	11,678,691	1,117,692	1,117,692	0	51,697	0	51,697
2061	11,621,466	1,089,731	1,089,731	0	46,887	0	46,887
2062	11,595,851	1,060,341	1,060,341	0	42,439	0	42,439
2063	11,605,978	1,029,666	1,029,666	0	38,336	0	38,336
2064	11,656,128	997,820	997,820	0	34,559	0	34,559
2065	11,750,774	972,063	972,063	0	31,318	0	31,318
2066	11,887,201	951,836	951,836	0	28,527	0	28,527
2067	12,053,741	929,877	929,877	0	25,924	0	25,924

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

Fiscal Year Ending	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
2068	$ 12,264,050	$ 906,222	$ 906,222	$ 0	$ 23,502	$ 0	$ 23,502
2069	12,523,445	880,912	880,912	0	21,252	0	21,252
2070	12,837,611	853,995	853,995	0	19,165	0	19,165
2071	13,212,616	825,532	825,532	0	17,234	0	17,234
2072	13,654,929	795,594	795,594	0	15,450	0	15,450
2073	14,171,444	764,263	764,263	0	13,806	0	13,806
2074	14,769,494	731,631	731,631	0	12,295	0	12,295
2075	15,456,878	697,808	697,808	0	10,908	0	10,908
2076	16,241,877	662,917	662,917	0	9,640	0	9,640
2077	17,133,278	627,097	627,097	0	8,483	0	8,483
2078	18,140,390	590,505	590,505	0	7,430	0	7,430
2079	19,273,076	553,313	553,313	0	6,477	0	6,477
2080	20,541,767	515,711	515,711	0	5,615	0	5,615
2081	21,957,497	477,908	477,908	0	4,841	0	4,841
2082	23,531,920	440,134	440,134	0	4,147	0	4,147
2083	25,277,341	402,642	402,642	0	3,529	0	3,529
2084	27,206,738	365,705	365,705	0	2,982	0	2,982
2085	29,333,798	329,608	329,608	0	2,500	0	2,500
2086	31,672,949	294,640	294,640	0	2,079	0	2,079
2087	34,239,421	261,077	261,077	0	1,713	0	1,713
2088	37,049,312	229,172	229,172	0	1,399	0	1,399
2089	40,119,685	199,146	199,146	0	1,131	0	1,131
2090	43,468,669	171,181	171,181	0	904	0	904
2091	47,115,583	145,425	145,425	0	715	0	715
2092	51,081,058	121,987	121,987	0	558	0	558
2093	55,387,178	100,939	100,939	0	429	0	429
2094	60,057,630	82,307	82,307	0	326	0	326
2095	65,117,869	66,068	66,068	0	243	0	243
2096	70,595,303	52,152	52,152	0	179	0	179
2097	76,519,491	40,439	40,439	0	129	0	129
2098	82,922,356	30,770	30,770	0	91	0	91
2099	89,838,399	22,950	22,950	0	63	0	63
2100	97,304,939	16,763	16,763	0	43	0	43
2101	105,362,338	11,980	11,980	0	29	0	29
2102	114,054,252	8,371	8,371	0	19	0	19
2103	123,427,870	5,718	5,718	0	12	0	12
2104	133,534,179	3,819	3,819	0	7	0	7
2105	144,428,221	2,498	2,498	0	4	0	4
2106	156,169,382	1,604	1,604	0	3	0	3
2107	168,821,686	1,014	1,014	0	2	0	2
2108	182,454,115	636	636	0	1	0	1
2109	197,140,953	398	398	0	1	0	1
2110	212,962,163	251	251	0	0	0	0
2111	230,003,787	161	161	0	0	0	0
2112	248,358,393	105	105	0	0	0	0
2113	268,125,548	71	71	0	0	0	0
2114	289,412,337	50	50	0	0	0	0
2115	312,333,924	36	36	0	0	0	0
2116	337,014,155	27	27	0	0	0	0
2117	363,586,209	21	21	0	0	0	0
				Totals	$ 11,125,510	$ 0	$ 11,125,510

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 (meets the statutory salary definition) and does not include pay above any pay cap.
Deferred Inflows and Outflows of Resources	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
Discount Rate or Single Discount Rate	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: 1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and; 2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.
Entry Age Actuarial Cost Method or Entry Age Normal (EAN)	The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit 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

GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Fiduciary Net Position	The fiduciary net position is the value of the net assets of the trust restricted for pension benefits.
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 contribution entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contribution Entities	Non-employer contribution 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 contribution 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 Outflows (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.