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, 2018

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November 28, 2018

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 Public Employees Police and Fire Plan ("PEPFP"), as amended by Statement No. 82. These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

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

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing 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 Statements 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 Plan and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2018 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 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 individuals 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, 2018 (Dollars in Thousands)

		2018
Actuarial Valuation Date		June 30, 2018
Measurement Date of the Net Pension Liability		June 30, 2018
Employer's Fiscal Year Ending Date (Reporting Date)		Varies by Employer
Membership		
Number of		
- Service Retirements		7,534
- Survivors		1,875
- Disability Retirements		1,347
- Deferred Retirements		1,580
- Terminated other non-vested		1,188
- Active Members		11,673
- Total		25,197
Covered Payroll	$	976,657
Net Pension Liability		
Total Pension Liability	$	9,552,804
Plan Fiduciary Net Position	$	8,486,907
Net Pension Liability	$	1,065,897
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		88.84%
Net Pension Liability as a Percentage of Covered Payroll		109.14%
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*		3.62%
Last year ending June 30 in the 2019 to 2118 projection period for which projected benefit payments are fully funded		2118
Total Pension Expense/ (Income)	**$**	**41,114**

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	$	43,265	$	261,491
Changes in assumptions	$	1,379,165	$	1,569,139
Net difference between projected and actual earnings on pension plan investments	$	281,474	$	504,728
Total	$	1,703,904	$	2,335,358

* *Source: Based on the 20-Year Municipal GO Index of mixed maturity general obligation municipal bonds as of the weekly rate closest to but not later than the Measurement Date.*

Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans* establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions* establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements. 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, 2018.

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 GASB Statement No. 67. This information includes:

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

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, 2018 and a measurement date of June 30, 2018.

Measurement of the Net Pension Liability

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

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

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50%), then the following outcomes are expected:

1. The normal cost of the plan is expected to remain approximately level as a percent of pay,
2. The funded status of the plan is expected to gradually improve and is expected to be 100% funded within the next 30 years, and
3. The unfunded liability will grow initially as a dollar amount before beginning to decline.

The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the market value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the actuarial value of assets were used instead of the market value of assets.

Limitation of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

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 3.62% (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%.

SECTION B

FINANCIAL STATEMENTS

Statement of Pension Expense under GASB Statement No. 68
Fiscal Year Ended June 30, 2018 (Dollars in Thousands)

A. Expense

1.	Service Cost	$	203,131
2.	Interest on the Total Pension Liability	$	682,903
3.	Current-Period Benefit Changes	$	(50,771)
4.	Employee Contributions (made negative for addition here)	$	(105,479)
5.	Projected Earnings on Plan Investments (made negative for addition here)	$	(584,693)
6.	Pension Plan Administrative Expense	$	886
7.	Other Changes in Plan Fiduciary Net Position	$	(58)
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	$	3,620
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period	$	(7,135)
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	$	(45,855)
11.	**Increase/(Decrease) from Experience in the Current Reporting Period**	**$**	**96,549**
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	$	(92,931)
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods	$	112,349
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	$	(74,853)
15.	**Total Pension Expense / (Income)**	**$**	**41,114**

Statement of Outflows and Inflows Arising from Current Reporting Period

Fiscal Year Ended June 30, 2018 (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	$	21,720
2. Assumption Changes (gains) or losses	$	(42,807)
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	$	3,620
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	(7,135)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	(3,515)
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	$	18,100
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	(35,672)
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	(17,572)

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(229,273)
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	$	(45,855)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(183,418)

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30, 2018 (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	$ 505,853	$ 489,950	$ 15,903
2. Due to Assets	165,483	286,191	(120,708)
3. Total	$ 671,336	$ 776,141	$ (104,805)

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	$ 10,137	$ 99,448	$ (89,311)
2. Assumption Changes	495,716	390,502	105,214
3. Net Difference between projected and actual earnings on pension plan investments	165,483	286,191	(120,708)
4. Total	$ 671,336	$ 776,141	$ (104,805)

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	$ 43,265	$ 261,491	$ (218,226)
2. Assumption Changes	1,379,165	1,569,139	(189,974)
3. Net Difference between projected and actual earnings on pension plan investments	281,474	504,728	(223,254)
4. Total	$ 1,703,904	$ 2,335,358	$ (631,454)

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
2019	$ 28,428
2020	(75,357)
2021	(154,493)
2022	(426,518)
2023	(3,514)
Thereafter	0
Total	$ (631,454)

Statement of Fiduciary Net Position as of June 30, 2018 (Dollars in Thousands)

	Market Value					
Assets in Trust	**June 30, 2018**			**June 30, 2017**		
Cash, Equivalents, Short Term Securities	$	90,015		$	190,809	
Fixed Income	$	2,060,635		$	1,535,288	
Equity	$	5,150,491		$	5,141,012	
SBI Alternative	$	1,172,591		$	1,038,994	
Other	$	-		$	-	
Total Assets in Trust	**$**	**8,473,732**		**$**	**7,906,103**	
Assets Receivable	$	18,731	*	$	18,348	*
Amounts Payable	$	(5,556)		$	(5,572)	
Net Position Restricted for Pensions	**$**	**8,486,907**		**$**	**7,918,879**	

** Includes $13.648 million contribution receivable from Minneapolis to be paid July 15.*

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2018 (Dollars in Thousands)

Change in Assets		**Market Value**	
Year Ending		**June 30, 2018**	**June 30, 2017**
1.	Fund balance at market value at beginning of year	$ 7,918,879	$ 7,098,090
2.	Contributions		
	a. Member	$ 105,479	$ 101,984
	b. Employer	$ 170,781 *	$ 166,329 *
	c. Other sources	$ 9,000	$ 9,000
	d. Total contributions	$ 285,260	$ 277,313
3.	Investment income		
	a. Investment income/(loss)	$ 822,887	$ 1,067,162
	b. Investment expenses	$ (8,921)	$ (8,220)
	c. Net subtotal	$ 813,966	$ 1,058,942
4.	Other	$ 58	$ 24
5.	**Total additions:** *(2.d.) + (3.c.) + (4.)*	**$ 1,099,284**	**$ 1,336,279**
6.	Benefits Paid		
	a. Annuity benefits	$ (528,468)	$ (512,379)
	b. Refunds	$ (1,902)	$ (2,119)
	c. Total benefits paid	$ (530,370)	$ (514,498)
7.	Expenses		
	a. Other	$ -	$ -
	b. Administrative	$ (886)	$ (992)
	c. Total expenses	$ (886)	$ (992)
8.	**Total deductions:** *(6.c.) + (7.c.)*	**$ (531,256)**	**$ (515,490)**
9.	Net increase (decrease) in net position: *(5) + (8)*	$ 568,028	$ 820,789
10.	**Net position restricted for pensions**	**$ 8,486,907**	**$ 7,918,879**
11.	Approximate return on market value of assets	10.4%	15.2%

** Includes $13.648 million contribution receivable from Minneapolis to be paid July 15.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2018 (Dollars in Thousands)

A. Total pension liability		
1. Service cost	$	203,131
2. Interest on the total pension liability	$	682,903
3. Changes of benefit terms	$	(50,771)
4. Difference between expected and actual experience of the total pension liability	$	21,720
5. Changes of assumptions	$	(42,807)
6. Benefit payments, including refunds of employee contributions	$	(530,370)
7. Net change in total pension liability	$	283,806
8. Total pension liability – beginning	$	9,268,998
9. Total pension liability – ending	**$**	**9,552,804**
B. Plan fiduciary net position		
1. Contributions – employer	$	179,781
2. Contributions – employee	$	105,479
3. Net investment income	$	813,966
4. Benefit payments, including refunds of employee contributions	$	(530,370)
5. Pension Plan Administrative Expense	$	(886)
6. Other	$	58
7. Net change in plan fiduciary net position	$	568,028
8. Plan fiduciary net position – beginning	$	7,918,879
9. Plan fiduciary net position – ending	**$**	**8,486,907**
C. Net pension liability	**$**	**1,065,897**
D. Plan fiduciary net position as a percentage of the total pension liability		**88.84%**
E. Covered-employee payroll*	**$**	**976,657**
F. Net pension liability as a percentage of covered-employee payroll		**109.14%**

**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,	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total Pension Liability										
Service Cost	$ 203,131	$ 318,401	$ 194,352	$ 187,959	$ 169,124					
Interest on the Total Pension Liability	$ 682,903	$ 616,740	$ 658,198	$ 648,233	$ 598,165					
Benefit Changes	$ (50,771)	$ -	$ -	$ -	$ -					
Difference between Expected and Actual Experience	$ 21,720	$ 37,292	$ (375,575)	$ (221,112)	$ 1,813					
Assumption Changes	$ (42,807)	$ (2,300,201)	$ 2,650,350	$ -	$ 323,945					
Benefit Payments	$ (528,468)	$ (512,379)	$ (498,608)	$ (481,330)	$ (452,462)					
Refunds	$ (1,902)	$ (2,119)	$ (2,391)	$ (1,953)	$ (1,633)					
Net Change in Total Pension Liability	$ 283,806	$ (1,842,266)	$ 2,626,326	$ 131,797	$ 638,952					
Total Pension Liability - Beginning	$ 9,268,998	$ 11,111,264	$ 8,484,938	$ 8,353,141	$ 7,714,189					
Total Pension Liability - Ending (a)	$ 9,552,804	$ 9,268,998	$ 11,111,264	$ 8,484,938	$ 8,353,141					
Plan Fiduciary Net Position										
Employer Contributions	$ 179,781	$ 175,329	$ 165,065	$ 153,317	$ 141,632					
Employee Contributions	$ 105,479	$ 101,984	$ 95,172	$ 88,733	$ 81,213					
Pension Plan Net Investment Income	$ 813,966	$ 1,058,942	$ (8,949)	$ 317,556	$ 1,158,389					
Benefit Payments	$ (528,468)	$ (512,379)	$ (498,608)	$ (481,330)	$ (452,462)					
Refunds	$ (1,902)	$ (2,119)	$ (2,391)	$ (1,953)	$ (1,633)					
Pension Plan Administrative Expense	$ (886)	$ (992)	$ (906)	$ (803)	$ (798)					
Other	$ 58	$ 24	$ 3	$ 84	$ 18					
Net Change in Plan Fiduciary Net Position	$ 568,028	$ 820,789	$ (250,614)	$ 75,604	$ 926,359					
Plan Fiduciary Net Position - Beginning	$ 7,918,879	$ 7,098,090	$ 7,348,704	$ 7,273,100	$ 6,346,741					
Plan Fiduciary Net Position - Ending (b)	$ 8,486,907	$ 7,918,879	$ 7,098,090	$ 7,348,704	$ 7,273,100					
Net Pension Liability - Ending (a) - (b)	$ 1,065,897	$ 1,350,119	$ 4,013,174	$ 1,136,234	$ 1,080,041					
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	88.84 %	85.43 %	63.88 %	86.61 %	87.07 %					
Covered Employee Payroll	$ 976,657	$ 944,296	$ 881,222	$ 845,076	$ 820,333					
Net Pension Liability as a Percentage of Covered Employee Payroll	109.14 %	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
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%
2018	$ 9,552,804	$ 8,486,907	$ 1,065,897	88.84%	$ 976,657	109.14%

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
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
2018	$ 193,183	$ 179,781	$ 13,402	$ 976,657	18.41

Notes to Schedule of Contributions

Methods and Assumptions Used to Determine Contribution Rates for Fiscal Year Ending June 30, 2018:

Valuation Date:	June 30, 2017
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	26 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	2.75%
Payroll Growth	3.50%
Salary Increases	3.50% to 12.50% 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 2017 valuation pursuant to an experience study of the period 2011 - 2015.
Mortality	RP-2014 annuitant generational mortalty table projected with mortality improvement scale MP-2016, from a base year of 2006. Male rates adjusted by a factor of 0.96.

Other Information:

Notes	The plan is assumed to pay a 2.50% post retirement benefit increase beginning January 1, 2034. See separate funding report as of July 1, 2017 for additional detail.

Schedule of Investment Returns Multiyear

Last 10 Fiscal Years

FY Ending June 30,	Annual Return[1]
2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	
2018	

[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, 2018, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Final Target Allocation	Long-Term Expected Real Rate of Return (geometric)
Domestic Equity	33%	36%	5.10%
International Equity	16%	17%	5.30%
Private Markets	25%	25%	5.90%
Fixed Income	24%	20%	0.75%
Unallocated Cash	2%	2%	0.00%
Total	100%	100%	

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, 2017.

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 3.62%. 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	$ 10,772,257	$ 9,552,804	$ 8,544,367
Net Position Restricted for Pensions	$ 8,486,907	$ 8,486,907	$ 8,486,907
Net Pension Liability	**$ 2,285,350**	**$ 1,065,897**	**$ 57,460**

Note that we believe the 8.5% interest rate assumption would not comply with Actuarial Standards of Practice.

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

				Current Period		
	Total Pension Liability (a)	**Plan Fiduciary Net Position (b)**	**Net Pension Liability (a) - (b)**	**Deferred Outflows**	**Deferred Inflows**	**Pension Expense***
Balance Beginning of Year	**$ 9,268,998**	**$ 7,918,879**	**$ 1,350,119**			
Changes for the Year:						
Service Cost	$ 203,131		$ 203,131			$ 203,131
Interest on Total Pension Liability	$ 682,903		$ 682,903			$ 682,903
Interest on Fiduciary Net Position		$ 584,693	$ (584,693)			$ (584,693)
Changes in Benefit Terms	$ (50,771)		$ (50,771)			$ (50,771)
Liability Experience Gains and Losses	$ 21,720		$ 21,720	$ 18,100	$ -	$ 3,620
Changes in Assumptions	$ (42,807)		$ (42,807)	$ -	$ 35,672	$ (7,135)
Contributions - Employer		$ 179,781	$ (179,781)			
Contributions - Employees		$ 105,479	$ (105,479)			$ (105,479)
Asset Gain/(Loss)		$ 229,273	$ (229,273)	$ -	$ 183,418	$ (45,855)
Benefit Payouts	$ (530,370)	$ (530,370)				
Administrative Expenses		$ (886)	$ 886			$ 886
Other		$ 58	$ (58)			$ (58)
Net Changes	**$ 283,806**	**$ 568,028**	**$ (284,222)**	**$ 18,100**	**$ 219,090**	**$ 96,549**
Balance End of Year	**$ 9,552,804**	**$ 8,486,907**	**$ 1,065,897**			

** 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	**$ 9,268,998**	**$ 7,918,879**	**$ 1,350,119**				
Changes for the Year:							
Service Cost	$ 203,131		$ 203,131				$ 203,131
Interest on Total Pension Liability	$ 682,903		$ 682,903				$ 682,903
Interest on Fiduciary Net Position		$ 584,693	$ (584,693)				$ (584,693)
Changes in Benefit Terms	$ (50,771)		$ (50,771)				$ (50,771)
Liability Experience Gains and Losses	$ 21,720		$ 21,720	$ 43,265	$ 261,491	$ (329,257)	$ (89,311)
Changes in Assumptions	$ (42,807)		$ (42,807)	$ 1,379,165	$ 1,569,139	$ (41,953)	$ 105,214
Contributions - Employer		$ 179,781	$ (179,781)				
Contributions - Employees		$ 105,479	$ (105,479)				$ (105,479)
Asset Gain/(Loss)		$ 229,273	$ (229,273)	$ 281,474	$ 504,728	$ (114,689)	$ (120,708)
Benefit Payouts	$ (530,370)	$ (530,370)					
Administrative Expenses		$ (886)	$ 886				$ 886
Other		$ 58	$ (58)				$ (58)
Net Changes	**$ 283,806**	**$ 568,028**	**$ (284,222)**				**$ 41,114**
Balance End of Year	**$ 9,552,804**	**$ 8,486,907**	**$ 1,065,897**	**$ 1,703,904**	**$ 2,335,358**	**$ (485,899)**	

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

Summary of Population Statistics

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2017	**11,522**	**1,506**	**1,134**	**7,408**	**1,310**	**1,861**	**24,741**
New members	641						641
Return to active	57	(22)	(35)	0	0	0	0
Terminated non-vested	(93)	0	93	0	0	0	0
Service retirements	(206)	(71)	0	277	0	0	0
Terminated deferred	(163)	163	0	0	0	0	0
Terminated refund/transfer	(31)	(19)	(27)	0	0	0	(77)
Deaths	(7)	(3)	(2)	(155)	(21)	(93)	(281)
New beneficiary	0	0	0	0	0	114	114
Disabled	(48)	0	0	0	48	0	0
Data adjustments	1	26	25	4	10	(7)	59
Net change	151	74	54	126	37	14	456
Members on 6/30/2018	**11,673**	**1,580**	**1,188**	**7,534**	**1,347**	**1,875**	**25,197**

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.

<table>
<tr><td>Plan year</td><td>July 1 through June 30.</td></tr>
<tr><td>Eligibility</td><td>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.</td></tr>
<tr><td>Contributions</td><td>
<table>
<tr><th>Effective as of</th><th>Member</th><th>Employer</th><th>Total</th></tr>
<tr><td>Prior to January 1, 2019</td><td>10.80%</td><td>16.20%</td><td>27.00%</td></tr>
<tr><td>January 1, 2019</td><td>11.30%</td><td>16.95%</td><td>28.25%</td></tr>
<tr><td>January 1, 2020 and later</td><td>11.80%</td><td>17.70%</td><td>29.50%</td></tr>
</table>

Member contributions are “picked up” according to the provisions of Internal Revenue Code 414(h).</td></tr>
<tr><td>State contributions</td><td>$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), or July 1, 2048, if earlier.
In addition, $4.5 million in fiscal years 2019 and 2020, and $9.0 million thereafter, until the plan reaches 100% funding, or July 1, 2048, if earlier.</td></tr>
<tr><td>Allowable service</td><td>Police and Fire service during which member contributions were made. May also include certain leaves of absence and military service.</td></tr>
<tr><td>Salary</td><td>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.</td></tr>
<tr><td>Average salary</td><td>Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years.</td></tr>
</table>

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

Vesting		**Vesting Percent if First Hired**		
	Years of Service	**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, adjusted for partial vesting if applicable. 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. 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.

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

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.

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

Death (Concluded)

Duty disability surviving dependent children's benefit

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%.

Surviving spouse optional annuity

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	
Refund of contributions	
Age/service requirement	Termination of public service.
Amount	Member's contributions with 6.00% interest through June 30, 2011, compounded daily. Beginning July 1, 2011, a member's contributions increase at 4.00% interest compounded daily. Beginning July 1, 2018, a member’s contributions increase at 3.00% interest compounded daily. If a member is vested, a deferred annuity may be elected in lieu of a refund.
Deferred benefit	
Age/service requirement	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; (e.) 1.00% from January 1, 2012 through December 31, 2018; and (f.) 0.00% from January 1, 2019, 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.
Actuarial equivalent factors	Effective July 1, 2019, actuarially equivalent factors based on the RP-2014 mortality table for healthy annuitants for a member turning age 55 in 2021, reflecting projected mortality improvements using Scale MP-2017, male rates multiplied by 0.96, blended 90% males, and 6.50% interest.

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 benefits 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	Post-retirement benefit increases were changed to 1.0% for all years, with no trigger. An end date of July 1, 2048 was added to the existing $9.0 million state contribution. New annual state aid will equal $4.5 million in fiscal years 2019 and 2020, and $9.0 million thereafter until the plan reaches 100% funding, or July 1, 2048, if earlier. Member contributions were changed from 10.8% to 11.3% of pay, effective January 1, 2019 and 11.8% of pay, effective January 1, 2020. Employer contributions were changed from 16.20% to 16.95% of pay, effective January 1, 2019 and 17.70% of pay, effective January 1, 2020. Interest credited on member contributions decreased from 4.0% to 3.0%, beginning July 1, 2018. Deferred augmentation was changed to 0.00%, effective January 1, 2019. Augmentation that has already accrued for deferred members will still apply. Actuarial equivalent factors were updated to reflect revised mortality and interest assumptions.

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.

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.

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.

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, and a review of inflation and investment assumptions, dated September 11, 2017.

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.
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-2017, from a base year of 2006.
Healthy post-retirement	RP-2014 annuitant generational mortality table projected with mortality improvement scale MP-2017 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-2017 from a base year of 2006. Male rates are adjusted by a factor of 0.96.
Notes	The RP-2014 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 18 to 80 and the annuitant mortality table contains mortality rates for ages 50 to 120. We have extended the annuitant mortality table as needed for members younger than age 50 who are receiving a benefit by deriving rates based on the employee table and the juvenile table. Similarly, we have extended the employee table as needed for members older than age 80 by deriving rates based on the annuitant table.
Retirement	Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. Note that plan changes reflected in this report may ultimately result in behavior changes that are not anticipated in the current retirement rates.
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, based on average results for applicable members at the time of the last experience study, were applied: <u>Data for active members:</u> There were 41 members reported with a salary less than $100. We used prior year salary (26 members), if available; otherwise high five salary with a 10% load to account for salary increases (15 members). If neither prior year salary nor high five salary was available, we assumed a value of $35,000. Note former members of Minneapolis Fire are excluded from these salary counts as salary is not used to calculate the benefit. There were also 133 members reported without a gender. We assumed male gender. There were 9 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 (1 member), we assumed a value of $24,000. If credited service was not reported (13 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 (7 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 8 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 21 members reported without a gender. We assumed retirees are male and beneficiaries are female. There were 13 members that were active last year and retirement eligible and none on the retiree data file this year. At the direction of PERA, we included these members in the 2018 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 205 retirees as disabled retirees in this valuation.
Changes in actuarial assumptions	The mortality projection scale was changed from MP-2016 to MP-2017.

Summary of Actuarial Assumptions (Continued)

Age in 2018	Percentage of Members Dying Each Year*					
	Healthy Post-Retirement Mortality		Healthy Pre-Retirement Mortality		Disability Mortality	
	Males	Females	Males	Females	Males	Females
20	0.04%	0.02%	0.04%	0.02%	0.04%	0.02%
25	0.06	0.03	0.05	0.02	0.06	0.03
30	0.09	0.07	0.05	0.02	0.09	0.07
35	0.13	0.12	0.06	0.03	0.13	0.12
40	0.19	0.17	0.07	0.05	0.19	0.17
45	0.27	0.22	0.10	0.07	0.27	0.22
50	0.39	0.27	0.17	0.11	0.39	0.27
55	0.56	0.38	0.28	0.18	0.56	0.38
60	0.78	0.58	0.49	0.27	0.78	0.58
65	1.12	0.85	0.88	0.39	1.12	0.85
70	1.67	1.31	1.43	0.64	1.67	1.31
75	2.66	2.16	2.39	1.11	2.66	2.16
80	4.49	3.69	4.06	1.95	4.49	3.69
85	7.87	6.60	7.99	5.15	7.87	6.60
90	13.83	11.75	14.57	11.33	13.83	11.75

* *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		Rates of Disability Retirement	
	Males	Females	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
50	10.00%
51	7.00
52	7.00
53	10.00
54	10.00
55	25.00
56	22.50
57	22.50
58	22.50
59	20.00
60	22.50
61	25.00
62	30.00
63	30.00
64	30.00
65	50.00
66	50.00
67	50.00
68	50.00
69	50.00
70+	100.00

Salary Scale	
Year	Increase
1	12.25%
2	10.50%
3	8.75%
4	7.75%
5	6.25%
6	5.75%
7	5.25%
8	5.00%
9	4.75%
10	4.50%
11	4.25%
12	4.15%
13	4.05%
14	3.95%
15	3.85%
16	3.75%
17	3.75%
18	3.75%
19	3.75%
20	3.75%
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 municipal bond rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the 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 3.62%; 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
2018	$ 976,657	$ 0	$ 976,657						
2019	1,000,474	0	1,000,474	$ 110,552	$ 165,829	$ 0	$ 15,338	$ 13,500	$ 305,219
2020	994,145	38,845	1,032,990	114,824	172,285	3,065	15,338	13,500	319,012
2021	983,109	83,453	1,066,562	116,007	174,010	7,102	15,338	18,000	330,457
2022	968,106	133,119	1,101,225	114,236	171,355	11,328	15,308	18,000	330,227
2023	949,697	187,318	1,137,015	112,064	168,096	15,941	15,308	18,000	329,409
2024	928,863	245,105	1,173,968	109,606	164,409	20,858	15,308	18,000	328,181
2025	905,931	306,191	1,212,122	106,900	160,350	26,057	15,308	18,000	326,615
2026	880,901	370,615	1,251,516	103,946	155,920	31,539	15,308	18,000	324,713
2027	854,178	438,012	1,292,190	100,793	151,189	37,275	15,308	18,000	322,565
2028	826,002	508,184	1,334,186	97,468	146,202	43,247	15,308	18,000	320,225
2029	796,958	580,589	1,377,547	94,041	141,062	49,408	15,308	18,000	317,819
2030	767,045	655,273	1,422,318	90,511	135,767	55,764	15,308	18,000	315,350
2031	735,843	732,700	1,468,543	86,829	130,244	62,353	15,308	18,000	312,734
2032	703,471	812,800	1,516,271	83,010	124,514	69,169	15,308	18,000	310,001
2033	669,676	895,873	1,565,549	79,022	118,533	76,239	0	18,000	291,794
2034	634,537	981,893	1,616,430	74,875	112,313	83,559	0	0	270,747
2035	598,162	1,070,802	1,668,964	70,583	105,875	91,125	0	0	267,583
2036	560,548	1,162,657	1,723,205	66,145	99,217	98,942	0	0	264,304
2037	521,758	1,257,451	1,779,209	61,567	92,351	107,009	0	0	260,927
2038	482,029	1,355,005	1,837,034	56,879	85,319	115,311	0	0	257,509
2039	441,879	1,454,858	1,896,737	52,142	78,213	123,808	0	0	254,163
2040	401,485	1,556,896	1,958,381	47,375	71,063	132,492	0	0	250,930
2041	361,233	1,660,795	2,022,028	42,626	63,938	141,334	0	0	247,898
2042	321,685	1,766,059	2,087,744	37,959	56,938	150,292	0	0	245,189
2043	283,314	1,872,282	2,155,596	33,431	50,147	159,331	0	0	242,909
2044	246,650	1,979,003	2,225,653	29,105	43,657	168,413	0	0	241,175
2045	211,817	2,086,170	2,297,987	24,994	37,492	177,533	0	0	240,019
2046	179,047	2,193,624	2,372,671	21,128	31,691	186,677	0	0	239,496
2047	148,789	2,300,994	2,449,783	17,557	26,336	195,815	0	0	239,708
2048	121,396	2,408,005	2,529,401	14,325	21,487	204,921	0	0	240,733
2049	97,268	2,514,339	2,611,607	11,478	17,216	213,970	0	0	242,664
2050	76,578	2,619,906	2,696,484	9,036	13,554	222,954	0	0	245,544
2051	59,322	2,724,797	2,784,119	7,000	10,500	231,880	0	0	249,380
2052	45,314	2,829,289	2,874,603	5,347	8,021	240,773	0	0	254,141
2053	34,153	2,933,875	2,968,028	4,030	6,045	249,673	0	0	259,748
2054	25,353	3,039,136	3,064,489	2,992	4,487	258,630	0	0	266,109
2055	18,418	3,145,667	3,164,085	2,173	3,260	267,696	0	0	273,129
2056	12,999	3,253,919	3,266,918	1,534	2,301	276,908	0	0	280,743
2057	8,854	3,364,238	3,373,092	1,045	1,567	286,297	0	0	288,909
2058	5,776	3,476,942	3,482,718	682	1,022	295,888	0	0	297,592
2059	3,591	3,592,315	3,595,906	424	636	305,706	0	0	306,766
2060	2,112	3,710,661	3,712,773	249	374	315,777	0	0	316,400
2061	1,162	3,832,276	3,833,438	137	206	326,127	0	0	326,470
2062	596	3,957,429	3,958,025	70	105	336,777	0	0	336,952
2063	285	4,086,376	4,086,661	34	50	347,751	0	0	347,835
2064	128	4,219,349	4,219,477	15	23	359,067	0	0	359,105
2065	52	4,356,558	4,356,610	6	9	370,743	0	0	370,758
2066	17	4,498,183	4,498,200	2	3	382,795	0	0	382,800
2067	5	4,644,387	4,644,392	1	1	395,237	0	0	395,239
2068	1	4,795,333	4,795,334	0	-	408,083	0	0	408,083

**Contributions related to future employees in excess of normal cost and expenses of 20.99% of pay.*

***Additional state contributions assumed to end after 15 years. Actual end date will depend on funding status of this plan and the MSRS State Patrol Plan.*

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
2069	$ -	$ 4,951,183	$ 4,951,183	$ 0	$ 0	$ 421,346	$ 0	$ 0	$ 421,346
2070	0	5,112,096	5,112,096	0	0	435,039	0	0	435,039
2071	0	5,278,239	5,278,239	0	0	449,178	0	0	449,178
2072	0	5,449,782	5,449,782	0	0	463,776	0	0	463,776
2073	0	5,626,900	5,626,900	0	0	478,849	0	0	478,849
2074	0	5,809,774	5,809,774	0	0	494,412	0	0	494,412
2075	0	5,998,592	5,998,592	0	0	510,480	0	0	510,480
2076	0	6,193,546	6,193,546	0	0	527,071	0	0	527,071
2077	0	6,394,836	6,394,836	0	0	544,201	0	0	544,201
2078	0	6,602,669	6,602,669	0	0	561,887	0	0	561,887
2079	0	6,817,255	6,817,255	0	0	580,148	0	0	580,148
2080	0	7,038,816	7,038,816	0	0	599,003	0	0	599,003
2081	0	7,267,578	7,267,578	0	0	618,471	0	0	618,471
2082	0	7,503,774	7,503,774	0	0	638,571	0	0	638,571
2083	0	7,747,647	7,747,647	0	0	659,325	0	0	659,325
2084	0	7,999,445	7,999,445	0	0	680,753	0	0	680,753
2085	0	8,259,427	8,259,427	0	0	702,877	0	0	702,877
2086	0	8,527,858	8,527,858	0	0	725,721	0	0	725,721
2087	0	8,805,014	8,805,014	0	0	749,307	0	0	749,307
2088	0	9,091,177	9,091,177	0	0	773,659	0	0	773,659
2089	0	9,386,640	9,386,640	0	0	798,803	0	0	798,803
2090	0	9,691,706	9,691,706	0	0	824,764	0	0	824,764
2091	0	10,006,686	10,006,686	0	0	851,569	0	0	851,569
2092	0	10,331,904	10,331,904	0	0	879,245	0	0	879,245
2093	0	10,667,690	10,667,690	0	0	907,820	0	0	907,820
2094	0	11,014,390	11,014,390	0	0	937,325	0	0	937,325
2095	0	11,372,358	11,372,358	0	0	967,788	0	0	967,788
2096	0	11,741,960	11,741,960	0	0	999,241	0	0	999,241
2097	0	12,123,573	12,123,573	0	0	1,031,716	0	0	1,031,716
2098	0	12,517,589	12,517,589	0	0	1,065,247	0	0	1,065,247
2099	0	12,924,411	12,924,411	0	0	1,099,867	0	0	1,099,867
2100	0	13,344,455	13,344,455	0	0	1,135,613	0	0	1,135,613
2101	0	13,778,149	13,778,149	0	0	1,172,521	0	0	1,172,521
2102	0	14,225,939	14,225,939	0	0	1,210,627	0	0	1,210,627
2103	0	14,688,282	14,688,282	0	0	1,249,973	0	0	1,249,973
2104	0	15,165,651	15,165,651	0	0	1,290,597	0	0	1,290,597
2105	0	15,658,535	15,658,535	0	0	1,332,541	0	0	1,332,541
2106	0	16,167,437	16,167,437	0	0	1,375,849	0	0	1,375,849
2107	0	16,692,879	16,692,879	0	0	1,420,564	0	0	1,420,564
2108	0	17,235,398	17,235,398	0	0	1,466,732	0	0	1,466,732
2109	0	17,795,548	17,795,548	0	0	1,514,401	0	0	1,514,401
2110	0	18,373,903	18,373,903	0	0	1,563,619	0	0	1,563,619
2111	0	18,971,055	18,971,055	0	0	1,614,437	0	0	1,614,437
2112	0	19,587,615	19,587,615	0	0	1,666,906	0	0	1,666,906
2113	0	20,224,212	20,224,212	0	0	1,721,080	0	0	1,721,080
2114	0	20,881,499	20,881,499	0	0	1,777,016	0	0	1,777,016
2115	0	21,560,148	21,560,148	0	0	1,834,769	0	0	1,834,769
2116	0	22,260,852	22,260,852	0	0	1,894,399	0	0	1,894,399
2117	0	22,984,330	22,984,330	0	0	1,955,966	0	0	1,955,966
2118	0	23,731,321	23,731,321	0	0	2,019,535	0	0	2,019,535

**Contributions related to future employees in excess of normal cost and expenses of 20.99% of pay.*

***Additional state contributions assumed to end after 15 years. Actual end date will depend on funding status of this plan and the MSRS State Patrol Plan.*

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)
2019	$ 8,486,907	$ 305,219	$ 555,056	$ 900	$ 627,285	$ 8,863,455
2020	8,863,455	319,012	574,567	895	655,316	9,262,321
2021	9,262,321	330,457	595,413	885	684,885	9,681,365
2022	9,681,365	330,228	617,864	871	715,479	10,108,337
2023	10,108,337	329,409	641,497	855	746,602	10,541,996
2024	10,541,996	328,181	667,222	836	778,135	10,980,254
2025	10,980,254	326,614	694,021	815	809,960	11,421,992
2026	11,421,992	324,713	722,156	793	841,986	11,865,742
2027	11,865,742	322,565	751,036	769	874,125	12,310,627
2028	12,310,627	320,225	779,995	743	906,340	12,756,454
2029	12,756,454	317,819	808,672	717	938,633	13,203,517
2030	13,203,517	315,350	837,686	690	971,005	13,651,496
2031	13,651,496	312,734	866,765	662	1,003,437	14,100,240
2032	14,100,240	310,001	895,777	633	1,035,925	14,549,756
2033	14,549,756	291,793	924,992	603	1,067,894	14,983,848
2034	14,983,848	270,747	954,129	571	1,098,604	15,398,499
2035	15,398,499	267,583	983,914	538	1,128,491	15,810,121
2036	15,810,121	264,304	1,014,162	504	1,158,129	16,217,888
2037	16,217,888	260,928	1,044,174	470	1,187,483	16,621,655
2038	16,621,655	257,509	1,074,330	434	1,216,531	17,020,931
2039	17,020,931	254,163	1,104,036	398	1,245,261	17,415,921
2040	17,415,921	250,930	1,133,110	361	1,273,697	17,807,077
2041	17,807,077	247,898	1,161,115	325	1,301,892	18,195,427
2042	18,195,427	245,189	1,187,751	290	1,329,939	18,582,514
2043	18,582,514	242,909	1,212,479	255	1,357,978	18,970,667
2044	18,970,667	241,175	1,235,055	222	1,386,195	19,362,760
2045	19,362,760	240,019	1,255,876	191	1,414,794	19,761,506
2046	19,761,506	239,496	1,274,690	161	1,443,989	20,170,140
2047	20,170,140	239,707	1,290,928	134	1,474,048	20,592,833
2048	20,592,833	240,733	1,304,030	109	1,505,306	21,034,733
2049	21,034,733	242,664	1,313,210	88	1,538,182	21,502,281
2050	21,502,281	245,545	1,318,088	69	1,573,175	22,002,844
2051	22,002,844	249,380	1,318,434	53	1,610,847	22,544,584
2052	22,544,584	254,140	1,314,302	41	1,651,805	23,136,186
2053	23,136,186	259,748	1,306,155	31	1,696,682	23,786,430
2054	23,786,430	266,110	1,294,608	23	1,746,110	24,504,019
2055	24,504,019	273,130	1,280,229	17	1,800,717	25,297,620
2056	25,297,620	280,743	1,263,266	12	1,861,143	26,176,228
2057	26,176,228	288,909	1,243,869	8	1,928,053	27,149,313
2058	27,149,313	297,592	1,222,212	5	2,002,152	28,226,840
2059	28,226,840	306,765	1,198,437	3	2,084,180	29,419,345
2060	29,419,345	316,400	1,172,721	2	2,174,919	30,737,941
2061	30,737,941	326,470	1,145,242	1	2,275,197	32,194,365
2062	32,194,365	336,953	1,116,170	1	2,385,885	33,801,032
2063	33,801,032	347,835	1,085,671	0	2,507,909	35,571,105
2064	35,571,105	359,104	1,053,903	0	2,642,249	37,518,555
2065	37,518,555	370,758	1,021,002	0	2,789,948	39,658,259
2066	39,658,259	382,801	987,078	0	2,952,119	42,006,101
2067	42,006,101	395,239	952,226	0	3,129,948	44,579,062
2068	44,579,062	408,083	916,539	0	3,324,707	47,395,313

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)
2069	$ 47,395,313	$ 421,346	$ 880,106	$ 0	$ 3,537,756	$ 50,474,309
2070	50,474,309	435,039	843,015	0	3,770,551	53,836,884
2071	53,836,884	449,178	805,358	0	4,024,651	57,505,355
2072	57,505,355	463,776	767,226	0	4,301,728	61,503,633
2073	61,503,633	478,849	728,717	0	4,603,572	65,857,337
2074	65,857,337	494,412	689,931	0	4,932,101	70,593,919
2075	70,593,919	510,480	650,975	0	5,289,371	75,742,795
2076	75,742,795	527,071	611,964	0	5,677,584	81,335,486
2077	81,335,486	544,201	573,020	0	6,099,100	87,405,767
2078	87,405,767	561,887	534,273	0	6,556,449	93,989,830
2079	93,989,830	580,148	495,860	0	7,052,341	101,126,459
2080	101,126,459	599,003	457,926	0	7,589,679	108,857,215
2081	108,857,215	618,471	420,626	0	8,171,576	117,226,636
2082	117,226,636	638,571	384,126	0	8,801,367	126,282,448
2083	126,282,448	659,325	348,599	0	9,482,625	136,075,799
2084	136,075,799	680,753	314,233	0	10,219,181	146,661,500
2085	146,661,500	702,877	281,214	0	11,015,139	158,098,302
2086	158,098,302	725,721	249,729	0	11,874,900	170,449,194
2087	170,449,194	749,307	219,946	0	12,803,182	183,781,737
2088	183,781,737	773,659	192,013	0	13,805,048	198,168,431
2089	198,168,431	798,803	166,046	0	14,885,932	213,687,120
2090	213,687,120	824,764	142,134	0	16,051,670	230,421,420
2091	230,421,420	851,569	120,332	0	17,308,532	248,461,189
2092	248,461,189	879,245	100,668	0	18,663,258	267,903,024
2093	267,903,024	907,820	83,141	0	20,123,093	288,850,796
2094	288,850,796	937,325	67,721	0	21,695,831	311,416,231
2095	311,416,231	967,788	54,345	0	23,389,852	335,719,526
2096	335,719,526	999,241	42,923	0	25,214,178	361,890,022
2097	361,890,022	1,031,716	33,332	0	27,178,514	390,066,920
2098	390,066,920	1,065,247	25,423	0	29,293,308	420,400,052
2099	420,400,052	1,099,867	19,025	0	31,569,803	453,050,697
2100	453,050,697	1,135,613	13,957	0	34,020,104	488,192,457
2101	488,192,457	1,172,521	10,028	0	36,657,240	526,012,190
2102	526,012,190	1,210,627	7,052	0	39,495,233	566,710,998
2103	566,710,998	1,249,973	4,853	0	42,549,173	610,505,291
2104	610,505,291	1,290,597	3,268	0	45,835,299	657,627,919
2105	657,627,919	1,332,541	2,156	0	49,371,082	708,329,386
2106	708,329,386	1,375,849	1,397	0	53,175,314	762,879,152
2107	762,879,152	1,420,564	892	0	57,268,212	821,567,036
2108	821,567,036	1,466,732	565	0	61,671,515	884,704,718
2109	884,704,718	1,514,401	357	0	66,408,604	952,627,366
2110	952,627,366	1,563,619	229	0	71,504,620	1,025,695,376
2111	1,025,695,376	1,614,437	150	0	76,986,595	1,104,296,258
2112	1,104,296,258	1,666,906	101	0	82,883,595	1,188,846,658
2113	1,188,846,658	1,721,080	71	0	89,226,871	1,279,794,538
2114	1,279,794,538	1,777,016	52	0	96,050,022	1,377,621,524
2115	1,377,621,524	1,834,769	40	0	103,389,173	1,482,845,426
2116	1,482,845,426	1,894,399	31	0	111,283,162	1,596,022,956
2117	1,596,022,956	1,955,966	25	0	119,773,744	1,717,752,641
2118	1,717,752,641	2,019,535	20	0	128,905,811	1,848,677,967

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)
2019	$ 8,486,907	$ 555,056	$ 555,056	$ 0	$ 535,343	$ 0	$ 535,343
2020	8,863,456	574,567	574,567	0	515,499	0	515,499
2021	9,262,322	595,413	595,413	0	496,933	0	496,933
2022	9,681,366	617,864	617,864	0	479,693	0	479,693
2023	10,108,337	641,497	641,497	0	463,294	0	463,294
2024	10,541,997	667,222	667,222	0	448,254	0	448,254
2025	10,980,254	694,021	694,021	0	433,728	0	433,728
2026	11,421,993	722,156	722,156	0	419,825	0	419,825
2027	11,865,742	751,036	751,036	0	406,152	0	406,152
2028	12,310,628	779,995	779,995	0	392,384	0	392,384
2029	12,756,454	808,672	808,672	0	378,428	0	378,428
2030	13,203,516	837,686	837,686	0	364,657	0	364,657
2031	13,651,495	866,765	866,765	0	350,991	0	350,991
2032	14,100,239	895,777	895,777	0	337,432	0	337,432
2033	14,549,755	924,992	924,992	0	324,127	0	324,127
2034	14,983,847	954,129	954,129	0	311,011	0	311,011
2035	15,398,499	983,914	983,914	0	298,344	0	298,344
2036	15,810,120	1,014,162	1,014,162	0	286,061	0	286,061
2037	16,217,887	1,044,174	1,044,174	0	273,978	0	273,978
2038	16,621,655	1,074,330	1,074,330	0	262,224	0	262,224
2039	17,020,932	1,104,036	1,104,036	0	250,674	0	250,674
2040	17,415,922	1,133,110	1,133,110	0	239,326	0	239,326
2041	17,807,078	1,161,115	1,161,115	0	228,131	0	228,131
2042	18,195,427	1,187,751	1,187,751	0	217,083	0	217,083
2043	18,582,514	1,212,479	1,212,479	0	206,142	0	206,142
2044	18,970,667	1,235,055	1,235,055	0	195,331	0	195,331
2045	19,362,760	1,255,876	1,255,876	0	184,766	0	184,766
2046	19,761,506	1,274,690	1,274,690	0	174,450	0	174,450
2047	20,170,141	1,290,928	1,290,928	0	164,347	0	164,347
2048	20,592,834	1,304,030	1,304,030	0	154,432	0	154,432
2049	21,034,734	1,313,210	1,313,210	0	144,669	0	144,669
2050	21,502,283	1,318,088	1,318,088	0	135,076	0	135,076
2051	22,002,845	1,318,434	1,318,434	0	125,685	0	125,685
2052	22,544,585	1,314,302	1,314,302	0	116,550	0	116,550
2053	23,136,188	1,306,155	1,306,155	0	107,746	0	107,746
2054	23,786,432	1,294,608	1,294,608	0	99,343	0	99,343
2055	24,504,021	1,280,229	1,280,229	0	91,386	0	91,386
2056	25,297,622	1,263,266	1,263,266	0	83,884	0	83,884
2057	26,176,230	1,243,869	1,243,869	0	76,833	0	76,833
2058	27,149,315	1,222,212	1,222,212	0	70,228	0	70,228
2059	28,226,841	1,198,437	1,198,437	0	64,058	0	64,058
2060	29,419,346	1,172,721	1,172,721	0	58,310	0	58,310
2061	30,737,943	1,145,242	1,145,242	0	52,971	0	52,971
2062	32,194,367	1,116,170	1,116,170	0	48,024	0	48,024
2063	33,801,034	1,085,671	1,085,671	0	43,453	0	43,453
2064	35,571,106	1,053,903	1,053,903	0	39,239	0	39,239
2065	37,518,557	1,021,002	1,021,002	0	35,362	0	35,362
2066	39,658,261	987,078	987,078	0	31,802	0	31,802
2067	42,006,103	952,226	952,226	0	28,538	0	28,538
2068	44,579,064	916,539	916,539	0	25,552	0	25,552

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)
2069	$ 47,395,315	$ 880,106	$ 880,106	$ 0	$ 22,825	$ 0	$ 22,825
2070	50,474,311	843,015	843,015	0	20,338	0	20,338
2071	53,836,886	805,358	805,358	0	18,074	0	18,074
2072	57,505,357	767,226	767,226	0	16,017	0	16,017
2073	61,503,636	728,717	728,717	0	14,151	0	14,151
2074	65,857,340	689,931	689,931	0	12,463	0	12,463
2075	70,593,922	650,975	650,975	0	10,939	0	10,939
2076	75,742,797	611,964	611,964	0	9,566	0	9,566
2077	81,335,487	573,020	573,020	0	8,332	0	8,332
2078	87,405,768	534,273	534,273	0	7,227	0	7,227
2079	93,989,831	495,860	495,860	0	6,239	0	6,239
2080	101,126,461	457,926	457,926	0	5,360	0	5,360
2081	108,857,217	420,626	420,626	0	4,580	0	4,580
2082	117,226,638	384,126	384,126	0	3,891	0	3,891
2083	126,282,451	348,599	348,599	0	3,285	0	3,285
2084	136,075,801	314,233	314,233	0	2,754	0	2,754
2085	146,661,503	281,214	281,214	0	2,293	0	2,293
2086	158,098,305	249,729	249,729	0	1,894	0	1,894
2087	170,449,197	219,946	219,946	0	1,552	0	1,552
2088	183,781,739	192,013	192,013	0	1,260	0	1,260
2089	198,168,433	166,046	166,046	0	1,014	0	1,014
2090	213,687,122	142,134	142,134	0	807	0	807
2091	230,421,423	120,332	120,332	0	636	0	636
2092	248,461,192	100,668	100,668	0	495	0	495
2093	267,903,027	83,141	83,141	0	380	0	380
2094	288,850,799	67,721	67,721	0	288	0	288
2095	311,416,234	54,345	54,345	0	215	0	215
2096	335,719,529	42,923	42,923	0	158	0	158
2097	361,890,025	33,332	33,332	0	114	0	114
2098	390,066,923	25,423	25,423	0	81	0	81
2099	420,400,055	19,025	19,025	0	56	0	56
2100	453,050,700	13,957	13,957	0	38	0	38
2101	488,192,460	10,028	10,028	0	26	0	26
2102	526,012,193	7,052	7,052	0	17	0	17
2103	566,711,000	4,853	4,853	0	11	0	11
2104	610,505,293	3,268	3,268	0	7	0	7
2105	657,627,921	2,156	2,156	0	4	0	4
2106	708,329,388	1,397	1,397	0	2	0	2
2107	762,879,154	892	892	0	1	0	1
2108	821,567,038	565	565	0	1	0	1
2109	884,704,721	357	357	0	1	0	1
2110	952,627,369	229	229	0	0	0	0
2111	1,025,695,379	150	150	0	0	0	0
2112	1,104,296,261	101	101	0	0	0	0
2113	1,188,846,661	71	71	0	0	0	0
2114	1,279,794,541	52	52	0	0	0	0
2115	1,377,621,526	40	40	0	0	0	0
2116	1,482,845,428	31	31	0	0	0	0
2117	1,596,022,956	25	25	0	0	0	0
2118	1,717,752,641	20	20	0	0	0	0
				Totals	$ 11,449,145	$ 0	$ 11,449,145

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.