Gabriel Roeder Smith & Company
Consultants & Actuaries

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, 2015

GRS
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November 25, 2015

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"). 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.

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 calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. 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.

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 otherwise audited.

To the best of our knowledge, the information contained with 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. 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 opinion contained herein.

Respectfully submitted,

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

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

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OTHER OBSERVATIONS

Limitations of Funded Status Measurements

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

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

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

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

SECTION A
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

		2015
Actuarial Valuation Date		June 30, 2015
Measurement Date of the Net Pension Liability		June 30, 2015
Employer's Fiscal Year Ending Date (Reporting Date)		Varies by Employer
Membership		
Number of		
- Service Retirements		7,121
- Survivors		1,894
- Disability Retirements		1,194
- Deferred Retirements		1,560
- Terminated other non-vested		995
- Active Members		11,157
- Total		23,921
Covered Payroll	$	845,076
Net Pension Liability		
Total Pension Liability	$	8,484,938
Plan Fiduciary Net Position		7,348,704
Net Pension Liability	$	1,136,234
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		86.61%
Net Pension Liability as a Percentage of Covered Payroll		134.45%
Development of the Single Discount Rate		
Single Discount Rate		7.90%
Long-Term Expected Rate of Investment Return		7.90%
Long-Term Municipal Bond Rate*		3.80%
Last year ending June 30 in the 2016 to 2115 projection period for which projected benefit payments are fully funded		2115
Total Pension Expense/ (Income)	**$**	**116,861**

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	$	1,209	$	184,260
Changes in assumptions		215,963		0
Net difference between projected and actual earnings on pension plan investments		197,970		399,697
Total	$	415,142	$	583,957

** Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 25, 2015 (i.e., the weekly rate closest to but not later than the Measurement Date).*

DISCUSSION

Accounting Standard

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

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

Financial Statements

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

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to PEPFP subsequent to the measurement date of June 30, 2015.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

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

Notes to Financial Statements

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

Both GASB Statements No. 67 and No. 68 require the notes to the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with Statement No. 67. This information includes:

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

Required Supplementary Information

Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2015 and a measurement date of June 30, 2015.

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 (which is published by the Federal Reserve) 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 7.90%; the municipal bond rate is 3.80% (based on the weekly rate closest to but not later than the measurement date of the 20-Year Bond Buyer Index as published by the Federal Reserve Board); and the resulting single discount rate is 7.90%.

Effective Date and Transition

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

SECTION B

FINANCIAL STATEMENTS

PENSION EXPENSE UNDER GASB STATEMENT NO. 68
FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Expense

1.	Service Cost	$	187,959
2.	Interest on the Total Pension Liability		648,233
3.	Current-Period Benefit Changes		0
4.	Employee Contributions (made negative for addition here)		(88,733)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(565,018)
6.	Pension Plan Administrative Expense		803
7.	Other Changes in Plan Fiduciary Net Position		(84)
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		(36,852)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Current Reporting Period		0
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Current Reporting Period		49,492
11.	**Increase/(Decrease) from Experience in the Current Reporting Period**	**$**	**195,800**
12.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		
	Arising from Prior Reporting Periods		302
13.	Recognition of Outflow (Inflow) of Resources due to assumption changes		
	Arising from Prior Reporting Periods		53,991
14.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		
	Arising from Prior Reporting Periods		(133,232)
15.	**Total Pension Expense / (Income)**	**$**	**116,861**

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD
FISCAL YEAR ENDED JUNE 30, 2015 (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	(221,112)
2. Assumption Changes (gains) or losses	0
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	6
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	(36,852)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	0
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	(36,852)
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	(184,260)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	0
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	(184,260)
B. Outflows (Inflows) of Resources due to Assets	
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	247,462
2. Recognition period for Assets {in years}	5
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	49,492
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	197,970

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS FISCAL YEAR ENDED JUNE 30, 2015 (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	$ 54,293	$ 36,852	$ 17,441
2. Due to Assets	49,492	133,232	(83,740)
3. Total	$ 103,785	$ 170,084	$ (66,299)

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	$ 302	$ 36,852	$ (36,550)
2. Assumption Changes	53,991	0	53,991
3. Net Difference between projected and actual earnings on pension plan investments	49,492	133,232	(83,740)
4. Total	$ 103,785	$ 170,084	$ (66,299)

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	$ 1,209	$ 184,260	$ (183,051)
2. Assumption Changes	215,963	0	215,963
3. Net Difference between projected and actual earnings on pension plan investments	197,970	399,697	(201,727)
4. Total	$ 415,142	$ 583,957	$ (168,815)

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
2016	$ (66,299)
2017	(66,299)
2018	(66,300)
2019	66,935
2020	(36,852)
Thereafter	0
Total	$ (168,815)

STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2015 (DOLLARS IN THOUSANDS)

	Market Value	
Assets in Trust	**June 30, 2015**	**June 30, 2014**
Cash, Equivalents, Short Term Securities	$ 141,036	$ 188,578
Fixed Income	1,727,568	1,696,489
Equity	4,563,032	4,458,763
SBI Alternative	905,931	917,040
Other	0	0
Total Assets in Trust	**$ 7,337,567**	**$ 7,260,870**
Assets Receivable	14,267 *	15,304 **
Amounts Payable	(3,130)	(3,074)
Net Position Restricted for Pensions	**$ 7,348,704**	**$ 7,273,100**

** Includes $11.534 contribution from Minneapolis to be paid by July 15, 2015.*
*** Includes $11.534 contribution from Minneapolis to be paid by July 15, 2014.*

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

Change in Assets		**Market Value**	
Year Ending		**June 30, 2015**	**June 30, 2014**
1.	Fund balance at market value at beginning of year	$ 7,273,100	$ 6,346,741
2.	Contributions		
	a. Member	88,733	81,213
	b. Employer	144,317 *	132,632 **
	c. Other sources	9,000	9,000
	d. Total contributions	242,050	222,845
3.	Investment income		
	a. Investment income/(loss)	327,786	1,168,495
	b. Investment expenses	(10,230)	(10,106)
	c. Net subtotal	317,556	1,158,389
4.	Other	84	18
5.	**Total additions:** *(2.d.) + (3.c.) + (4.)*	**$ 559,690**	**$ 1,381,252**
6.	Benefits Paid		
	a. Annuity benefits	(481,330)	(452,462)
	b. Refunds	(1,953)	(1,633)
	c. Total benefits paid	(483,283)	(454,095)
7.	Expenses		
	a. Other	0	0
	b. Administrative	(803)	(798)
	c. Total expenses	(803)	(798)
8.	**Total deductions:** *(6.c.) + (7.c.)*	**(484,086)**	**(454,893)**
9.	Net increase (decrease) in net position: *(5) + (8)*	75,604	926,359
10.	**Net position restricted for pensions**	**$ 7,348,704**	**$ 7,273,100**
11.	Approximate return on market value of assets	4.4%	18.6%

* *Includes $11.534 contribution from Minneapolis to be paid by July 15, 2015.*
** *Includes $11.534 contribution from Minneapolis to be paid by July 15, 2014.*

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD FISCAL YEAR ENDED JUNE 30, 2015 (DOLLARS IN THOUSANDS)

A. Total pension liability		
1. Service cost	$	187,959
2. Interest on the total pension liability		648,233
3. Changes of benefit terms		0
4. Difference between expected and actual experience of the total pension liability*		(221,112)
5. Changes of assumptions		0
6. Benefit payments, including refunds of employee contributions		(483,283)
7. Net change in total pension liability	$	131,797
8. Total pension liability – beginning		8,353,141
9. Total pension liability – ending	**$**	**8,484,938**
B. Plan fiduciary net position		
1. Contributions – employer	$	153,317
2. Contributions – employee		88,733
3. Net investment income		317,556
4. Benefit payments, including refunds of employee contributions		(483,283)
5. Pension Plan Administrative Expense		(803)
6. Other		84
7. Net change in plan fiduciary net position	$	75,604
8. Plan fiduciary net position – beginning		7,273,100
9. Plan fiduciary net position – ending	**$**	**7,348,704**
C. Net pension liability	**$**	**1,136,234**
D. Plan fiduciary net position as a percentage of the total pension liability		**86.61%**
E. Covered-employee payroll	**$**	**845,076**
F. Net pension liability as a percentage of covered employee payroll		**134.45%**

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

The covered payroll shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered Payroll as defined in GASB Statement Nos. 67 and 68.

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,	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Pension Liability										
Service Cost	$ 187,959	$ 169,124								
Interest on the Total Pension Liability	648,233	598,165								
Benefit Changes	0	0								
Difference between Expected and Actual Experience	(221,112)	1,813								
Assumption Changes	0	323,945								
Benefit Payments	(481,330)	(452,462)								
Refunds	(1,953)	(1,633)								
Net Change in Total Pension Liability	131,797	638,952								
Total Pension Liability - Beginning	8,353,141	7,714,189								
Total Pension Liability - Ending (a)	$ 8,484,938	$ 8,353,141								
Plan Fiduciary Net Position										
Employer Contributions	$ 153,317	$ 141,632								
Employee Contributions	88,733	81,213								
Pension Plan Net Investment Income	317,556	1,158,389								
Benefit Payments	(481,330)	(452,462)								
Refunds	(1,953)	(1,633)								
Pension Plan Administrative Expense	(803)	(798)								
Other	84	18								
Net Change in Plan Fiduciary Net Position	75,604	926,359								
Plan Fiduciary Net Position - Beginning	7,273,100	6,346,741								
Plan Fiduciary Net Position - Ending (b)	$ 7,348,704	$ 7,273,100								
Net Pension Liability - Ending (a) - (b)	1,136,234	1,080,041								
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	86.61 %	87.07 %								
Covered Employee Payroll	$ 845,076	$ 820,333								
Net Pension Liability as a Percentage of Covered Employee Payroll	134.45 %	131.66 %								

Notes to Schedule:

N/A

The covered payroll shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered Payroll as defined in GASB Statement Nos. 67 and 68.

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
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 8,353,141	$ 7,273,100	$ 1,080,041	87.07%	$ 820,333	131.66%
2015	8,484,938	7,348,704	1,136,234	86.61%	845,076	134.45%

The covered payroll shown represents the annual compensation for active employees on which contributions to the pension plan are based and does not necessarily represent Covered Payroll as defined in GASB Statement Nos. 67 and 68.

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
2006	$ 107,681	$ 63,603	$ 44,078	$ 618,435	10.28%
2007	116,325	74,707	41,618	648,342	11.52
2008	144,548	87,023	57,525	703,701	12.37
2009	140,591	101,548	39,043	733,164	13.85
2010	150,220	107,066	43,154	740,101	14.47
2011	124,284	109,604	14,680	775,806	14.13
2012	152,369	121,891	30,478	794,417	15.34
2013	189,254	125,995	63,259	796,188	15.82
2014	163,985	141,632	22,353	820,333	17.27
2015	197,325	153,317	44,008	845,076	18.14

NOTES TO SCHEDULE OF CONTRIBUTIONS

Valuation Date:	June 30, 2015
Notes	Actuarially determined contribution rates are calculated as of each July 1 and apply to the fiscal year beginning on the measurement date.

Methods and Assumptions Used to Determine Contribution Rates:

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%
Salary Increases	4.25% to 12.75% including inflation
Investment Rate of Return	8.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2011 valuation pursuant to an experience study of the period 2004 - 2009, prepared by a former actuary.
Mortality	RP-2000 annuitant generational mortality table, projected with scale AA, white collar adjustment.

Other Information:

Notes	The plan is assumed to pay a 2.5% post retirement benefit increase beginning January 1, 2035. See separate funding report as of July 1, 2015 for additional detail.

SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

Last 10 Fiscal Years

FY Ending June 30,	Annual Return[1]
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	
2015	

[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

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Domestic Fixed Income		
International Fixed Income		
Domestic Equity		
International Equity		
Private Equity		
Real Estate		
Commodities		
Cash		
Total		

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.

Single Discount Rate

A single discount rate of 7.90% 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 7.90%. 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 was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 7.90%, 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 6.90%	Current Single Discount Rate Assumption 7.90%	1% Increase 8.90%
Total Pension Liability	$ 9,563,236	$ 8,484,938	$ 7,594,076
Net Position Restricted for Pensions	7,348,704	7,348,704	7,348,704
Net Pension Liability	**$ 2,214,532**	**$ 1,136,234**	**$ 245,372**

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

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Current Period: Deferred Outflows	Current Period: Deferred Inflows	Current Period: Pension Expense
Balance Beginning of Year	**$ 8,353,141**	**$ 7,273,100**	**$ 1,080,041**			
Changes for the Year:						
Service Cost	$ 187,959		$ 187,959			$ 187,959
Interest on Total Pension Liability	648,233		648,233			648,233
Interest on Fiduciary Net Position		$ 565,018	(565,018)			(565,018)
Changes in Benefit Terms						
Liability Experience Gains and Losses	(221,112)		(221,112)		$ 184,260	(36,852)
Changes in Assumptions						
Contributions - Employer		153,317	(153,317)			
Contributions - Employees		88,733	(88,733)			(88,733)
Asset Gain/(Loss)		(247,462)	247,462	$ 197,970		49,492
Benefit Payouts	(483,283)	(483,283)				
Administrative Expenses		(803)	803			803
Other		84	(84)			(84)
Net Changes	**$ 131,797**	**$ 75,604**	**$ 56,193**	**$ 197,970**	**$ 184,260**	**$ 195,800**
Balance End of Year	**$ 8,484,938**	**$ 7,348,704**	**$ 1,136,234**	**$ 197,970**	**$ 184,260**	

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	**$ 8,353,141**	**$ 7,273,100**	**$ 1,080,041**				
Changes for the Year:							
Service Cost	$ 187,959		$ 187,959				$ 187,959
Interest on Total Pension Liability	648,233		648,233				648,233
Interest on Fiduciary Net Position		$ 565,018	(565,018)				(565,018)
Changes in Benefit Terms							
Liability Experience Gains and Losses	(221,112)		(221,112)	$ 1,209	$ 184,260	$ 1,511	(36,550)
Changes in Assumptions				215,963		269,954	53,991
Contributions - Employer		153,317	(153,317)				
Contributions - Employees		88,733	(88,733)				(88,733)
Asset Gain/(Loss)		(247,462)	247,462	197,970	399,697	(532,929)	(83,740)
Benefit Payouts	(483,283)	(483,283)					
Administrative Expenses		(803)	803				803
Other		84	(84)				(84)
Net Changes	**$ 131,797**	**$ 75,604**	**$ 56,193**	**$ 415,142**	**$ 583,957**	**$ (261,464)**	**$ 116,861**
Balance End of Year	**$ 8,484,938**	**$ 7,348,704**	**$ 1,136,234**	**$ 415,142**	**$ 583,957**	**$ (261,464)**	

SUMMARY OF POPULATION STATISTICS

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2014	**10,879**	**1,481**	**975**	**7,002**	**1,151**	**1,886**	**23,374**
New members	728	0	0	0	0	0	728
Return to active	47	(30)	(17)	0	0	0	0
Terminated non-vested	(67)	0	67	0	0	0	0
Service retirements	(174)	(92)	0	266	0	0	0
Terminated deferred	(185)	185	0	0	0	0	0
Terminated refund/transfer	(17)	(28)	(21)	0	0	0	(66)
Deaths	(8)	(5)	0	(147)	(14)	(80)	(254)
New beneficiary	0	0	0	0	0	95	95
Disabled	(45)	0	0	0	45	0	0
Data adjustments	(1)	49	(9)	0	12	(7)	44
Net change	278	79	20	119	43	8	547
Members on 6/30/2015	**11,157**	**1,560**	**995**	**7,121**	**1,194**	**1,894**	**23,921**

SECTION E

SUMMARY OF BENEFITS

SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN

Following is a summary of the major plan provisions used in the valuation of this report. PERA is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

Plan year	July 1 through June 30.
Eligibility	All full-time and certain part-time police officers and fire fighters, and certain paramedics, who are not contributing to any other local retirement fund.
Contributions	**Member** / **Employer** Percent of Salary January 1, 2015 & later: Member 10.80, Employer 16.20 Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
State Contributions	$9 million paid annually on October 1 until both PERA P&F and MSRS State Patrol become 90% funded (on a Market Value of Assets basis).
Allowable service	Police and Fire service during which member contributions were made. May also include certain leaves of absence and military service.
Salary	Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage.
Average salary	Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years.
Vesting	

	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	3.0% of Average Salary for each year of Allowable Service (up to 33 years if hired after June 30, 2014), pro rata for completed months. A pro-rata share of member contributions will be refunded at retirement for excess service.

Early retirement

Age/service requirement	Age 50 and at least partially vested.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date and 0.10% (0.20% for members enrolled in the plan after June 30, 2007) reduction for each month the member is under age 55. If the effective date of retirement is after June 30, 2019, the reduction is 5/12% for each month that the member is under age 55 at the time of retirement. The change in early retirement factors will be phased in over a five-year period for retirements occurring between July 1, 2014 and June 30, 2019.
Form of payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 25%, 50%, 75% or 100% Joint and Survivor with bounce back feature. The Joint and Survivor options are determined on an actuarially equivalent basis, but with no actuarial reduction for the bounce back feature.
Benefit Increases	Benefit recipients receive a future annual 1.0% post-retirement benefit increase. The annual adjustment will equal 2.5% any time the fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.5% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.0%. 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	60.00%, 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 (Continued)

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	
<u>Refund of contributions</u>	
Age/service requirement	Termination of public service.
Amount	If member terminated before July 1, 2011, member's contributions credited with 6% interest compounded annually prior to July 1, 2011 and 4% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually. A deferred annuity may be elected in lieu of a refund if vested.
<u>Deferred benefit</u>	
Age/service requirement	Partially or fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following percentage (augmentation) compounded annually for terminations prior to 2012: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; (d.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; and (e.) 1.00% from January 1, 2012 thereafter. Members who terminate after 2011 will receive no future augmentation. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Form of payment	Same as for retirement.
Optional form conversion factors	Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, no setbacks, blended 90% males, and 7.0% interest. The interest rate assumption will change to 6.5% on the earlier of the effective date of the next mortality adjustment or July 1, 2017.

SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN (CONCLUDED)

Combined service annuity	Members are eligible for combined service benefits if they: (a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or (b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010). Other requirements for combined service include: (a.) Member must have at least six months of allowable service credit in each plan worked under; and (b.) Member may not be in receipt of a benefit from another plan. Members who meet the above requirements must have their benefit based on the following: (a.) Allowable service in all covered plans is combined in order to determine eligibility for early retirement. (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Changes in plan provisions	The post-retirement benefit increase to be paid after attainment of the 90% funding threshold was changed, from inflation up to 2.5%, to a fixed rate of 2.5%.

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 1.0% per year through 2037 and 2.5% thereafter.
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% 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 1.0% post-retirement benefit increase. The annual adjustment will equal 2.5%, any time the Fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.5% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.0%.

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 1.0% per year through 2037 and 2.5% thereafter.

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% 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 1.0% post-retirement benefit increase. The annual adjustment will equal 2.5%, any time the fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.5% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.0%.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

ACTUARIAL METHODS

Actuarial Cost Method

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

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

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

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

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 1.0% post-retirement benefit increase. If the funding ratio reaches 90% (based on a 2.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.5%. If, after reverting to a 2.5% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.0%.

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

- Future investment returns of 7.90%
- Liabilities and normal cost based on statutory funding assumptions
  - Discount rate of 8.00%
  - Statutory salary increases (rate of 12.75% at year 1 declining to 4.25% at years 23 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 1.00% per year until the funding ratio threshold required to pay a 2.50% postretirement benefit increase is reached
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by PERA

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay a 2.50% postretirement benefit increase in the year 2037, and that the plan would begin paying 2.50% benefit increases on January 1, 2038. This assumption is reflected in our calculations.

Decrement Timing

All decrements are assumed to occur mid-year.

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 demographic assumptions are based on the last experience study, dated November 2010, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment.

Investment return	7.90% per annum.
Benefit increases after retirement	1.00% per annum through 2037 and 2.5% per annum thereafter.
Salary increases	Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service earned during the year.
Payroll growth	3.50% per year.
Mortality rates	
Healthy Pre-retirement	RP-2000 employee generational mortality table projected with scale AA, white collar adjustment, set back two years for males and females.
Healthy Post-retirement	RP-2000 annuitant generational mortality table projected with scale AA, white collar adjustment.
	The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50.
Disabled	RP-2000 healthy annuitant mortality table, white collar adjustment, set forward eight years for males and females.
Retirement	Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year.
Withdrawal	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	8.00%
2	5.00%
3	3.50%

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 30.00% to account for the effect of some participants having eligibility for a Combined Service Annuity.
Administrative expenses	Total prior year administrative expenses expressed as a percentage of prior year projected payroll are assumed to increase 3.50% per year and are allocated to the closed group based on the ratio of closed group payroll to total payroll.
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 65% of female active members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Wives are assumed to be three years younger than their husbands for male members, and husbands are assumed to be four years older than their wives for female members. 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: 5% elect 25% Joint & Survivor option 15% elect 50% Joint & Survivor option 5% elect 75% Joint & Survivor option 15% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option. Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.
Decrement operation	Withdrawal decrements do not operate during retirement eligibility.
Service credit accruals	It is assumed that members accrue one year of service credit per year.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

Unknown data for certain members	To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided. In cases where submitted data was missing or incomplete, the following assumptions were applied: Data for active members: There were 22 members reported with a salary less than $100. We used prior year salary (14 members), if available; otherwise high five salary with a 10% load to account for salary increases (7 members). If neither prior year salary nor high five salary was available, we assumed a value of $35,000 (1 member). Note former members of either Minneapolis Police or Minneapolis Fire are excluded from these salary counts as salary is not used to calculate the benefit. There were also 98 members reported without a gender. We assumed male gender. No members were reported without a date of birth. Data for terminated members: We calculated benefits for these members using the reported Average Salary and credited service. If Average Salary was not reported (4 members), we assumed a value of $24,000. If credited service was not reported (15 members), we used elapsed time from hire date to termination date (5 members); otherwise we assumed nine years of service (10 members). If termination date was invalid or not reported (10 members), we assumed the termination date was equal to the hire date plus credited service, otherwise the valuation date. There were 7 members reported without a gender; male was assumed. No members were reported without a date of birth. Data for inactive members: There were no members with missing or invalid dates of birth. There were 16 members reported without a gender. We assumed retirees are male and beneficiaries are female.
Changes in actuarial assumptions	The assumed post-retirement benefit increase rate was changed from 1.0% per year through 2030 and 2.5% per year thereafter to 1.0% per year through 2037 and 2.5% per year thereafter. For accounting purposes, this change was treated as a difference between expected and actual experience.

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

	Rate (%)*					
	Healthy Post-Retirement Mortality**		Healthy Pre-Retirement Mortality**		Disability Mortality	
Age	Male	Female	Male	Female	Male	Female
20	0.03%	0.02%	0.03%	0.02%	0.04%	0.02%
25	0.04	0.02	0.04	0.02	0.05	0.04
30	0.04	0.03	0.04	0.02	0.08	0.06
35	0.06	0.05	0.05	0.04	0.11	0.08
40	0.09	0.06	0.08	0.06	0.17	0.13
45	0.13	0.10	0.11	0.08	0.57	0.29
50	0.60	0.24	0.17	0.13	0.57	0.47
55	0.54	0.35	0.24	0.20	0.92	0.74
60	0.66	0.56	0.35	0.31	1.58	1.24
65	1.16	0.91	0.56	0.50	2.67	2.09
70	1.93	1.52	0.85	0.76	4.75	3.50

* *Generally, mortality rates are expected to increase as age increases. Due to the combination of pre-retirement rates, post-retirement rates, the white collar adjustment, and Projection Scale AA, the prescribed mortality tables have a few ages where assumed mortality decreases slightly instead of increases. We have used the rates as prescribed, but we note that although the prescribed assumption is reasonable in total, it may not be reasonable at every age. If the rates were reasonably adjusted so that they decreased at all ages, we would not expect the valuation results to be materially different.*

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

	Withdrawal Rates After Third Year		Disability Retirement	
Age	Male	Female	Male	Female
20	6.01%	6.01%	0.11%	0.11%
25	3.24	3.24	0.13	0.13
30	1.90	1.90	0.16	0.16
35	1.46	1.46	0.19	0.19
40	1.26	1.26	0.29	0.29
45	0.91	0.91	0.54	0.54
50	0.50	0.50	1.04	1.04
55	0.11	0.11	2.03	2.03
60	0.00	0.00	0.00	0.00

SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

Age	Retirement	Salary Scale Year	Salary Scale Increase
50	13%	1	12.75%
51	10	2	10.75%
52	10	3	8.75%
53	10	4	7.75%
54	13	5	6.25%
55	30	6	5.85%
56	20	7	5.55%
57	20	8	5.35%
58	20	9	5.15%
59	20	10	5.05%
60	25	11	4.95%
61	25	12	4.85%
62	35	13	4.75%
63	35	14	4.65%
64	35	15	4.55%
65	50	16	4.55%
66	50	17	4.55%
67	50	18	4.55%
68	50	19	4.55%
69	50	20	4.55%
70+	100	21	4.45%
		22	4.35%
		23+	4.25%

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

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

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve) 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 7.90%; the municipal bond rate is 3.80%; and the resulting single discount rate is 7.90%.

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					
Year	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
0	$ 845,076	$ 0	$ 845,076						
1	876,232	0	876,232	$ 94,633	$ 141,950	$ 0	$ 13,251	$ 9,000	$ 258,834
2	874,927	31,973	906,900	94,492	141,738	1,509	13,677	9,000	260,416
3	871,449	67,193	938,642	94,117	141,175	3,171	13,677	9,000	261,140
4	865,075	106,419	971,494	93,428	140,142	5,023	13,677	9,000	261,270
5	855,359	150,137	1,005,496	92,379	138,568	7,086	13,677	9,000	260,710
6	842,705	197,984	1,040,689	91,012	136,518	9,345	13,677	9,000	259,552
7	827,239	249,874	1,077,113	89,342	134,013	11,794	13,648	9,000	257,797
8	809,159	305,653	1,114,812	87,389	131,084	14,427	13,648	9,000	255,548
9	788,843	364,987	1,153,830	85,195	127,793	17,227	13,648	9,000	252,863
10	766,442	427,772	1,194,214	82,776	124,164	20,191	13,648	9,000	249,779
11	741,877	494,135	1,236,012	80,123	120,184	23,323	13,648	9,000	246,278
12	715,510	563,762	1,279,272	77,275	115,913	26,610	13,648	9,000	242,446
13	687,588	636,459	1,324,047	74,259	111,389	30,041	13,648	9,000	238,337
14	658,685	711,703	1,370,388	71,138	106,707	33,592	13,648	9,000	234,085
15	628,385	789,967	1,418,352	67,866	101,798	37,286	13,648	9,000	229,598
16	596,182	871,812	1,467,994	64,388	96,582	41,150	13,648	9,000	224,768
17	562,316	957,058	1,519,374	60,730	91,095	45,173	0	9,000	205,998
18	526,702	1,045,850	1,572,552	56,884	85,326	49,364	0	9,000	200,574
19	489,633	1,137,958	1,627,591	52,880	79,320	53,712	0	9,000	194,912
20	451,043	1,233,514	1,684,557	48,713	73,069	58,222	0	9,000	189,004
21	411,278	1,332,239	1,743,517	44,418	66,627	62,882	0	9,000	182,927
22	370,891	1,433,649	1,804,540	40,056	60,084	67,668	0	9,000	176,808
23	330,737	1,536,962	1,867,699	35,720	53,579	72,545	0	9,000	170,844
24	291,626	1,641,442	1,933,068	31,496	47,243	77,476	0	0	156,215
25	253,619	1,747,106	2,000,725	27,391	41,086	82,463	0	0	150,940
26	217,432	1,853,319	2,070,751	23,483	35,224	87,477	0	0	146,184
27	183,857	1,959,370	2,143,227	19,857	29,785	92,482	0	0	142,124
28	153,400	2,064,840	2,218,240	16,567	24,851	97,460	0	0	138,878
29	126,191	2,169,687	2,295,878	13,629	20,443	102,409	0	0	136,481
30	101,984	2,274,250	2,376,234	11,014	16,521	107,345	0	0	134,880
31	80,956	2,378,446	2,459,402	8,743	13,115	112,263	0	0	134,121
32	63,200	2,482,281	2,545,481	6,826	10,238	117,164	0	0	134,228
33	48,551	2,586,022	2,634,573	5,244	7,865	122,060	0	0	135,169
34	36,712	2,690,071	2,726,783	3,965	5,947	126,971	0	0	136,883
35	27,279	2,794,942	2,822,221	2,946	4,419	131,921	0	0	139,286
36	19,866	2,901,133	2,920,999	2,146	3,218	136,933	0	0	142,297
37	14,075	3,009,159	3,023,234	1,520	2,280	142,032	0	0	145,832
38	9,651	3,119,396	3,129,047	1,042	1,564	147,235	0	0	149,841
39	6,390	3,232,173	3,238,563	690	1,035	152,559	0	0	154,284
40	4,052	3,347,861	3,351,913	438	656	158,019	0	0	159,113
41	2,446	3,466,784	3,469,230	264	396	163,632	0	0	164,292
42	1,407	3,589,246	3,590,653	152	228	169,412	0	0	169,792
43	773	3,715,553	3,716,326	83	125	175,374	0	0	175,582
44	405	3,845,992	3,846,397	44	66	181,531	0	0	181,641
45	200	3,980,821	3,981,021	22	32	187,895	0	0	187,949
46	95	4,120,262	4,120,357	10	15	194,476	0	0	194,501
47	43	4,264,526	4,264,569	5	7	201,286	0	0	201,298
48	18	4,413,811	4,413,829	2	3	208,332	0	0	208,337
49	8	4,568,305	4,568,313	1	1	215,624	0	0	215,626
50	4	4,728,200	4,728,204	0	1	223,171	0	0	223,172

**Contributions related to future employees in excess of normal cost and expenses of 22.28% of pay.*

For purposes of this projection, we assumed the current fixed rate contributions 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 CONTRIBUTIONS (CONCLUDED)
(DOLLARS IN THOUSANDS)

	Payroll			Projected Contributions					
Year	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
51	$ 2	$ 4,893,690	$ 4,893,692	$ 0	$ 0	$ 230,982	$ 0	$ 0	$ 230,982
52	1	5,064,970	5,064,971	0	0	239,067	0	0	239,067
53	0	5,242,245	5,242,245	0	0	247,434	0	0	247,434
54	0	5,425,723	5,425,723	0	0	256,094	0	0	256,094
55	0	5,615,624	5,615,624	0	0	265,057	0	0	265,057
56	0	5,812,170	5,812,170	0	0	274,334	0	0	274,334
57	0	6,015,596	6,015,596	0	0	283,936	0	0	283,936
58	0	6,226,142	6,226,142	0	0	293,874	0	0	293,874
59	0	6,444,057	6,444,057	0	0	304,160	0	0	304,160
60	0	6,669,599	6,669,599	0	0	314,805	0	0	314,805
61	0	6,903,035	6,903,035	0	0	325,823	0	0	325,823
62	0	7,144,641	7,144,641	0	0	337,227	0	0	337,227
63	0	7,394,704	7,394,704	0	0	349,030	0	0	349,030
64	0	7,653,519	7,653,519	0	0	361,246	0	0	361,246
65	0	7,921,392	7,921,392	0	0	373,890	0	0	373,890
66	0	8,198,640	8,198,640	0	0	386,976	0	0	386,976
67	0	8,485,593	8,485,593	0	0	400,520	0	0	400,520
68	0	8,782,589	8,782,589	0	0	414,538	0	0	414,538
69	0	9,089,979	9,089,979	0	0	429,047	0	0	429,047
70	0	9,408,128	9,408,128	0	0	444,064	0	0	444,064
71	0	9,737,413	9,737,413	0	0	459,606	0	0	459,606
72	0	10,078,222	10,078,222	0	0	475,692	0	0	475,692
73	0	10,430,960	10,430,960	0	0	492,341	0	0	492,341
74	0	10,796,044	10,796,044	0	0	509,573	0	0	509,573
75	0	11,173,905	11,173,905	0	0	527,408	0	0	527,408
76	0	11,564,992	11,564,992	0	0	545,868	0	0	545,868
77	0	11,969,767	11,969,767	0	0	564,973	0	0	564,973
78	0	12,388,708	12,388,708	0	0	584,747	0	0	584,747
79	0	12,822,313	12,822,313	0	0	605,213	0	0	605,213
80	0	13,271,094	13,271,094	0	0	626,396	0	0	626,396
81	0	13,735,583	13,735,583	0	0	648,319	0	0	648,319
82	0	14,216,328	14,216,328	0	0	671,011	0	0	671,011
83	0	14,713,899	14,713,899	0	0	694,496	0	0	694,496
84	0	15,228,886	15,228,886	0	0	718,803	0	0	718,803
85	0	15,761,897	15,761,897	0	0	743,962	0	0	743,962
86	0	16,313,563	16,313,563	0	0	770,000	0	0	770,000
87	0	16,884,538	16,884,538	0	0	796,950	0	0	796,950
88	0	17,475,497	17,475,497	0	0	824,843	0	0	824,843
89	0	18,087,139	18,087,139	0	0	853,713	0	0	853,713
90	0	18,720,189	18,720,189	0	0	883,593	0	0	883,593
91	0	19,375,396	19,375,396	0	0	914,519	0	0	914,519
92	0	20,053,535	20,053,535	0	0	946,527	0	0	946,527
93	0	20,755,408	20,755,408	0	0	979,655	0	0	979,655
94	0	21,481,848	21,481,848	0	0	1,013,943	0	0	1,013,943
95	0	22,233,712	22,233,712	0	0	1,049,431	0	0	1,049,431
96	0	23,011,892	23,011,892	0	0	1,086,161	0	0	1,086,161
97	0	23,817,308	23,817,308	0	0	1,124,177	0	0	1,124,177
98	0	24,650,914	24,650,914	0	0	1,163,523	0	0	1,163,523
99	0	25,513,696	25,513,696	0	0	1,204,246	0	0	1,204,246
100	0	26,406,676	26,406,676	0	0	1,246,395	0	0	1,246,395

**Contributions related to future employees in excess of normal cost and expenses of 22.28% of pay.*

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

SINGLE DISCOUNT RATE DEVELOPMENT
PROJECTION OF PLAN FIDUCIARY NET POSITION
(DOLLARS IN THOUSANDS)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	$ 7,348,704	$ 258,833	$ 518,534	$ 876	$ 570,450	$ 7,658,577
2	7,658,577	260,417	534,440	875	594,376	7,978,055
3	7,978,055	261,140	550,737	871	619,011	8,306,598
4	8,306,598	261,271	568,091	865	644,299	8,643,212
5	8,643,212	260,711	586,546	855	670,155	8,986,677
6	8,986,677	259,552	607,313	843	696,439	9,334,512
7	9,334,512	257,796	629,634	827	722,986	9,684,833
8	9,684,833	255,547	652,921	809	749,672	10,036,322
9	10,036,322	252,863	677,409	789	776,388	10,387,375
10	10,387,375	249,778	703,077	766	803,008	10,736,318
11	10,736,318	246,278	729,981	742	829,397	11,081,270
12	11,081,270	242,445	758,045	716	855,413	11,420,367
13	11,420,367	238,337	786,182	688	880,954	11,752,788
14	11,752,788	234,085	814,183	659	905,966	12,077,997
15	12,077,997	229,598	842,627	628	930,383	12,394,723
16	12,394,723	224,767	871,634	596	954,094	12,701,354
17	12,701,354	205,999	901,079	562	976,451	12,982,163
18	12,982,163	200,574	931,125	527	997,262	13,248,347
19	13,248,347	194,912	961,094	490	1,016,912	13,498,587
20	13,498,587	189,004	991,555	451	1,035,273	13,730,858
21	13,730,858	182,927	1,022,284	411	1,052,197	13,943,287
22	13,943,287	176,809	1,052,494	371	1,067,573	14,134,804
23	14,134,804	170,843	1,089,473	331	1,081,041	14,296,884
24	14,296,884	156,215	1,132,281	292	1,091,621	14,412,147
25	14,412,147	150,941	1,174,081	254	1,098,904	14,487,657
26	14,487,657	146,183	1,213,808	217	1,103,147	14,522,962
27	14,522,962	142,124	1,250,995	184	1,104,339	14,518,246
28	14,518,246	138,878	1,285,004	153	1,102,524	14,474,491
29	14,474,491	136,481	1,315,617	126	1,097,789	14,393,018
30	14,393,018	134,880	1,343,179	102	1,090,224	14,274,841
31	14,274,841	134,121	1,367,175	81	1,079,929	14,121,635
32	14,121,635	134,228	1,387,061	63	1,067,061	13,935,800
33	13,935,800	135,169	1,402,779	49	1,051,807	13,719,948
34	13,719,948	136,884	1,414,460	37	1,034,370	13,476,705
35	13,476,705	139,286	1,422,306	27	1,014,943	13,208,601
36	13,208,601	142,297	1,426,567	20	993,714	12,918,025
37	12,918,025	145,832	1,427,543	14	970,858	12,607,158
38	12,607,158	149,841	1,425,284	10	946,543	12,278,248
39	12,278,248	154,284	1,419,820	6	920,943	11,933,649
40	11,933,649	159,113	1,411,240	4	894,239	11,575,757
41	11,575,757	164,293	1,399,559	2	866,619	11,207,108
42	11,207,108	169,792	1,384,785	1	838,282	10,830,396
43	10,830,396	175,583	1,366,970	1	809,436	10,448,444
44	10,448,444	181,640	1,346,143	0	780,304	10,064,245
45	10,064,245	187,949	1,322,319	0	751,120	9,680,995
46	9,680,995	194,502	1,295,511	0	722,135	9,302,121
47	9,302,121	201,297	1,265,738	0	693,621	8,931,301
48	8,931,301	208,337	1,233,028	0	665,867	8,572,477
49	8,572,477	215,626	1,197,442	0	639,181	8,229,842
50	8,229,842	223,172	1,159,064	0	613,893	7,907,843

For purposes of this projection, we assumed the current fixed rate contributions 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)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.90%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	$ 7,907,843	$ 230,983	$ 1,117,997	$ 0	$ 590,349	$ 7,611,178
52	7,611,178	239,067	1,074,383	0	568,915	7,344,777
53	7,344,777	247,434	1,028,386	0	549,976	7,113,801
54	7,113,801	256,094	980,196	0	533,932	6,923,631
55	6,923,631	265,057	930,036	0	521,200	6,779,852
56	6,779,852	274,334	878,136	0	512,212	6,688,262
57	6,688,262	283,936	824,755	0	507,417	6,654,860
58	6,654,860	293,874	770,187	0	507,278	6,685,825
59	6,685,825	304,160	714,777	0	512,269	6,787,477
60	6,787,477	314,805	658,928	0	522,877	6,966,231
61	6,966,231	325,823	603,090	0	539,589	7,228,553
62	7,228,553	337,227	547,739	0	562,899	7,580,940
63	7,580,940	349,030	493,377	0	593,301	8,029,894
64	8,029,894	361,246	440,536	0	631,290	8,581,894
65	8,581,894	373,890	389,723	0	677,357	9,243,418
66	9,243,418	386,976	341,414	0	731,996	10,020,976
67	10,020,976	400,520	296,050	0	795,706	10,921,152
68	10,921,152	414,538	253,990	0	868,992	11,950,692
69	11,950,692	429,047	215,524	0	952,379	13,116,594
70	13,116,594	444,064	180,847	0	1,046,411	14,426,222
71	14,426,222	459,606	150,020	0	1,151,668	15,887,476
72	15,887,476	475,692	122,999	0	1,268,778	17,508,947
73	17,508,947	492,341	99,662	0	1,398,423	19,300,049
74	19,300,049	509,573	79,806	0	1,541,357	21,271,173
75	21,271,173	527,408	63,160	0	1,698,412	23,433,833
76	23,433,833	545,868	49,403	0	1,870,511	25,800,809
77	25,800,809	564,973	38,196	0	2,058,677	28,386,263
78	28,386,263	584,747	29,204	0	2,264,042	31,205,848
79	31,205,848	605,213	22,095	0	2,487,858	34,276,824
80	34,276,824	626,396	16,549	0	2,731,501	37,618,172
81	37,618,172	648,319	12,274	0	2,996,482	41,250,699
82	41,250,699	671,011	9,020	0	3,284,457	45,197,147
83	45,197,147	694,496	6,570	0	3,597,232	49,482,305
84	49,482,305	718,803	4,747	0	3,936,772	54,133,133
85	54,133,133	743,962	3,407	0	4,305,214	59,178,902
86	59,178,902	770,000	2,432	0	4,704,876	64,651,346
87	64,651,346	796,950	1,730	0	5,138,271	70,584,837
88	70,584,837	824,843	1,229	0	5,608,117	77,016,568
89	77,016,568	853,713	875	0	6,117,356	83,986,762
90	83,986,762	883,593	624	0	6,669,169	91,538,900
91	91,538,900	914,519	448	0	7,266,993	99,719,964
92	99,719,964	946,527	323	0	7,914,542	108,580,710
93	108,580,710	979,655	234	0	8,615,828	118,175,959
94	118,175,959	1,013,943	170	0	9,375,184	128,564,916
95	128,564,916	1,049,431	123	0	10,197,289	139,811,513
96	139,811,513	1,086,161	88	0	11,087,195	151,984,781
97	151,984,781	1,124,177	63	0	12,050,357	165,159,252
98	165,159,252	1,163,523	43	0	13,092,665	179,415,397
99	179,415,397	1,204,246	30	0	14,220,479	194,840,092
100	194,840,092	1,246,395	21	0	15,440,664	211,527,130

For purposes of this projection, we assumed the current fixed rate contributions 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)

Year	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)
1	$ 7,348,704	$ 518,534	$ 518,534	$ 0	$ 499,190	$ 0	$ 499,190
2	7,658,578	534,440	534,440	0	476,833	0	476,833
3	7,978,055	550,737	550,737	0	455,397	0	455,397
4	8,306,598	568,091	568,091	0	435,355	0	435,355
5	8,643,211	586,546	586,546	0	416,587	0	416,587
6	8,986,675	607,313	607,313	0	399,756	0	399,756
7	9,334,511	629,634	629,634	0	384,104	0	384,104
8	9,684,832	652,921	652,921	0	369,147	0	369,147
9	10,036,321	677,409	677,409	0	354,951	0	354,951
10	10,387,374	703,077	703,077	0	341,428	0	341,428
11	10,736,317	729,981	729,981	0	328,539	0	328,539
12	11,081,269	758,045	758,045	0	316,190	0	316,190
13	11,420,367	786,182	786,182	0	303,917	0	303,917
14	11,752,788	814,183	814,183	0	291,697	0	291,697
15	12,077,998	842,627	842,627	0	279,785	0	279,785
16	12,394,723	871,634	871,634	0	268,226	0	268,226
17	12,701,354	901,079	901,079	0	256,986	0	256,986
18	12,982,163	931,125	931,125	0	246,112	0	246,112
19	13,248,348	961,094	961,094	0	235,434	0	235,434
20	13,498,588	991,555	991,555	0	225,112	0	225,112
21	13,730,858	1,022,284	1,022,284	0	215,096	0	215,096
22	13,943,287	1,052,494	1,052,494	0	205,238	0	205,238
23	14,134,804	1,089,473	1,089,473	0	196,895	0	196,895
24	14,296,885	1,132,281	1,132,281	0	189,649	0	189,649
25	14,412,148	1,174,081	1,174,081	0	182,252	0	182,252
26	14,487,657	1,213,808	1,213,808	0	174,624	0	174,624
27	14,522,962	1,250,995	1,250,995	0	166,797	0	166,797
28	14,518,246	1,285,004	1,285,004	0	158,787	0	158,787
29	14,474,492	1,315,617	1,315,617	0	150,667	0	150,667
30	14,393,019	1,343,179	1,343,179	0	142,561	0	142,561
31	14,274,842	1,367,175	1,367,175	0	134,484	0	134,484
32	14,121,637	1,387,061	1,387,061	0	126,450	0	126,450
33	13,935,801	1,402,779	1,402,779	0	118,520	0	118,520
34	13,719,950	1,414,460	1,414,460	0	110,757	0	110,757
35	13,476,707	1,422,306	1,422,306	0	103,217	0	103,217
36	13,208,602	1,426,567	1,426,567	0	95,947	0	95,947
37	12,918,028	1,427,543	1,427,543	0	88,983	0	88,983
38	12,607,161	1,425,284	1,425,284	0	82,337	0	82,337
39	12,278,252	1,419,820	1,419,820	0	76,016	0	76,016
40	11,933,652	1,411,240	1,411,240	0	70,025	0	70,025
41	11,575,761	1,399,559	1,399,559	0	64,361	0	64,361
42	11,207,111	1,384,785	1,384,785	0	59,019	0	59,019
43	10,830,398	1,366,970	1,366,970	0	53,994	0	53,994
44	10,448,447	1,346,143	1,346,143	0	49,279	0	49,279
45	10,064,248	1,322,319	1,322,319	0	44,862	0	44,862
46	9,680,997	1,295,511	1,295,511	0	40,735	0	40,735
47	9,302,123	1,265,738	1,265,738	0	36,885	0	36,885
48	8,931,304	1,233,028	1,233,028	0	33,301	0	33,301
49	8,572,480	1,197,442	1,197,442	0	29,972	0	29,972
50	8,229,846	1,159,064	1,159,064	0	26,887	0	26,887

For purposes of this projection, we assumed the current fixed rate contributions 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 (CONCLUDED)
(DOLLARS IN THOUSANDS)

Year	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)
51	$ 7,907,847	$ 1,117,997	$ 1,117,997	$ 0	$ 24,036	$ 0	$ 24,036
52	7,611,182	1,074,383	1,074,383	0	21,407	0	21,407
53	7,344,781	1,028,386	1,028,386	0	18,990	0	18,990
54	7,113,805	980,196	980,196	0	16,775	0	16,775
55	6,923,636	930,036	930,036	0	14,751	0	14,751
56	6,779,857	878,136	878,136	0	12,908	0	12,908
57	6,688,267	824,755	824,755	0	11,236	0	11,236
58	6,654,866	770,187	770,187	0	9,724	0	9,724
59	6,685,831	714,777	714,777	0	8,364	0	8,364
60	6,787,482	658,928	658,928	0	7,146	0	7,146
61	6,966,236	603,090	603,090	0	6,062	0	6,062
62	7,228,558	547,739	547,739	0	5,102	0	5,102
63	7,580,945	493,377	493,377	0	4,259	0	4,259
64	8,029,900	440,536	440,536	0	3,525	0	3,525
65	8,581,900	389,723	389,723	0	2,890	0	2,890
66	9,243,423	341,414	341,414	0	2,346	0	2,346
67	10,020,981	296,050	296,050	0	1,886	0	1,886
68	10,921,156	253,990	253,990	0	1,499	0	1,499
69	11,950,697	215,524	215,524	0	1,179	0	1,179
70	13,116,599	180,847	180,847	0	917	0	917
71	14,426,227	150,020	150,020	0	705	0	705
72	15,887,481	122,999	122,999	0	536	0	536
73	17,508,952	99,662	99,662	0	402	0	402
74	19,300,054	79,806	79,806	0	299	0	299
75	21,271,179	63,160	63,160	0	219	0	219
76	23,433,840	49,403	49,403	0	159	0	159
77	25,800,816	38,196	38,196	0	114	0	114
78	28,386,269	29,204	29,204	0	81	0	81
79	31,205,854	22,095	22,095	0	57	0	57
80	34,276,830	16,549	16,549	0	39	0	39
81	37,618,177	12,274	12,274	0	27	0	27
82	41,250,704	9,020	9,020	0	18	0	18
83	45,197,152	6,570	6,570	0	12	0	12
84	49,482,310	4,747	4,747	0	8	0	8
85	54,133,138	3,407	3,407	0	6	0	6
86	59,178,907	2,432	2,432	0	4	0	4
87	64,651,351	1,730	1,730	0	2	0	2
88	70,584,842	1,229	1,229	0	2	0	2
89	77,016,573	875	875	0	1	0	1
90	83,986,768	624	624	0	1	0	1
91	91,538,905	448	448	0	0	0	0
92	99,719,969	323	323	0	0	0	0
93	108,580,716	234	234	0	0	0	0
94	118,175,965	170	170	0	0	0	0
95	128,564,922	123	123	0	0	0	0
96	139,811,520	88	88	0	0	0	0
97	151,984,787	63	63	0	0	0	0
98	165,159,258	43	43	0	0	0	0
99	179,415,403	30	30	0	0	0	0
100	194,840,099	21	21	0	0	0	0
				Totals	$ 10,291,039	$ 0	$ 10,291,039

For purposes of this projection, we assumed the current fixed rate contributions 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.

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.