Gabriel Roeder Smith & Company
Consultants & Actuaries

MINNESOTA STATE RETIREMENT SYSTEM

STATE PATROL RETIREMENT FUND

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

JUNE 30, 2014

GRS
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December 1, 2014

Minnesota State Retirement System
State Patrol Retirement Fund
St. Paul, Minnesota

Dear Board of Directors:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the State Patrol Retirement Fund ("SPRF"). 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. MSRS 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 Minnesota State Retirement System (MSRS) only in its entirety and only with the permission of MSRS.

This report is based upon information, furnished to us by MSRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not otherwise audited.

To the best of our knowledge, the information contained with this report is accurate and fairly represents the actuarial position of the State Patrol Retirement Fund as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. 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

TABLE OF CONTENTS

SECTION A
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

As of June 30, 2014 *(Dollars in Thousands)*

		2014
Actuarial Valuation Date		June 30, 2014
Measurement Date of the Net Pension Liability		June 30, 2014
Membership		
Number of		
- Service Retirements		776
- Survivors		155
- Disability Retirements		54
- Deferred Retirements		44
- Terminated other non-vested		17
- Active Members		858
- Total		1,904
Covered-employee Payroll		$ 63,952 (1)
Net Pension Liability		
Total Pension Liability		$ 826,673
Plan Fiduciary Net Position		667,340
Net Pension Liability		$ 159,333
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		80.73%
Net Pension Liability as a Percentage of Covered-employee Payroll		249.15%
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 (2)		4.29%
Last year ending June 30 in the 2015 to 2114 projection period for which projected benefit payments are fully funded		2114
Total Pension Expense / (Income)		$ 13,082

Deferred Outflows and Deferred Inflows of Resources by Source to be recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience in the measurement of Total Pension Liability	$ 0	$ 4,809
Changes in assumptions	25,048	0
Net difference between projected and actual earnings on pension plan investments	0	49,304
Total	$ 25,048	$ 54,113

(1) *Assumed equal to actual member contributions divided by employee contribution rate.*

(2) *Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 26, 2014 (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).

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the difference between expected and actual experience in the measurement of total pension liability, assumption changes, and investment experience.

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

Notes to Financial Statements

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

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

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

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

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

MSRS' comprehensive annual financial report, which contains the basic financial statements and related note disclosures for the State Patrol Retirement Fund can be obtained from MSRS at 60 Empire Drive, Suite 300, St. Paul, MN, 55103 or requested via email at info@msrs.us or telephone at 1-800-657-5757.

Required Supplementary Information

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

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

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, 2014 and a measurement date of June 30, 2014.

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 4.29% (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, 2014 *(Dollars in Thousands)*

A. Expense

1.	Service Cost	$	14,514
2.	Interest on the Total Pension Liability		60,183
3.	Current-Period Benefit Changes		
4.	Employee Contributions (made negative for addition here)		(7,930)
5.	Projected Earnings on Plan Investments (made negative for addition here)		(45,557)
6.	Pension Plan Administrative Expense		150
7.	Other Changes in Plan Fiduciary Net Position		
8.	Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability		(962)
9.	Recognition of Outflow (Inflow) of Resources due to assumption changes		5,010
10.	Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments		(12,326)
11.	**Total Pension Expense / (Income)**	**$**	**13,082**

Statement of Outflows and Inflows arising from Current Reporting Period

Fiscal Year Ended June 30, 2014 *(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	$	(5,771)
2. Assumption Changes (gains) or losses	$	30,058
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years, rounded to the nearest whole number}		6.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	$	(962)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$	5,010
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$	4,048
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	$	(4,809)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$	25,048
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$	20,239

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$	(61,630)
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$	(12,326)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$	(49,304)

STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS

Fiscal Year Ended June 30, 2014 *(Dollars in Thousands)*

A. Outflows and Inflows of Resources due to Liabilities and Assets to be recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Due to Liabilities	$ 5,010	$ 962	$ 4,048
2. Due to Assets	0	12,326	(12,326)
3. Total	$ 5,010	$ 13,288	$ (8,278)

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

	Outflows of Resources	Inflows of Resources	Net Outflows/(Inflows) of Resources
1. Differences between expected and actual experience	$ 0	$ 962	$ (962)
2. Assumption Changes	5,010	0	5,010
3. Net Difference between projected and actual earnings on pension plan investments		12,326	(12,326)
4. Total	$ 5,010	$ 13,288	$ (8,278)

C. Deferred Outflows and Deferred Inflows of Resources by Source to be recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/ (Inflows) of Resources
1. Differences between expected and actual experience	$ 0	$ 4,809	$ (4,809)
2. Assumption Changes	25,048	0	25,048
3. Net Difference between projected and actual earnings on pension plan investments	0	49,304	(49,304)
4. Total	$ 25,048	$ 54,113	$ (29,065)

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

Year Ending June 30	Net Deferred Outflows/ (Inflows) of Resources
2015	$ (8,278)
2016	(8,278)
2017	(8,278)
2018	(8,278)
2019	4,047
Thereafter	0
Total	$ (29,065)

STATEMENT OF FIDUCIARY NET POSITION

As of June 30, 2014 *(Dollars in Thousands)*

Assets		**June 30, 2014**
Cash & Short-term Investments	$	17,480
Receivables		701
Investment Pools (at fair value)		649,538
Securities Lending Collateral		72,256
Capital Assets		0
Total Assets	**$**	**739,975**
Total Deferred Outflows of Resources	**$**	**0**
Total Liabilities		**(72,635)**
Total Deferred Inflows of Resources		**0**
Net Position Restricted for Pensions	**$**	**667,340**

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

For the Fiscal Year Ended June 30, 2014 *(Dollars in Thousands)*

Change in Fiduciary Net Position		**Market Value**
Year Ending		**June 30, 2014**
1.	**Net Position at market value at beginning of year**	**$ 593,201**
Additions		
2.	Contributions	
	a. Member	$ 7,930
	b. Employer	11,894
	c. Other sources - Supplemental State Aid	1,000
	d. Total contributions	$ 20,824
3.	Investment income	
	a. Investment income/(loss)	$ 108,116
	b. Investment expenses	(929)
	c. Net investment income/(loss)	107,187
4.	Other Additions	$ 0
5.	**Total Additions:** *(2.d.) + (3.c.) + (4.)*	**$ 128,011**
Deductions		
6.	Benefits Paid	
	a. Annuity benefits	$ (53,697)
	b. Refunds	(25)
	c. Total benefits paid	$ (53,722)
7.	Expenses	
	a. Other deductions	$ 0
	b. Administrative	(150)
	c. Total expenses	$ (150)
8.	**Total deductions:** *(6.c.) + (7.c.)*	**$ (53,872)**
9.	**Net increase/(decrease) in fiduciary net position**	**$ 74,139**
10.	**Net Position at market value at end of year** *(1.) + (5.) + (8.)*	**$ 667,340**
11.	State Board of Investment calculated investment return	18.6%

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD

Fiscal Year Ended June 30, 2014 *(Dollars in Thousands)*

A. Total pension liability			
1. Service Cost	$	14,514	
2. Interest on the Total Pension Liability		60,183	
3. Changes of benefit terms			
4. Difference between expected and actual experience of the Total Pension Liability		(5,771)	
5. Changes of assumptions		30,058	(1)
6. Benefit payments, including refunds of employee contributions		(53,722)	
7. Net change in total pension liability	$	45,262	
8. Total pension liability – beginning		781,411	
9. Total pension liability – ending	**$**	**826,673**	
B. Plan fiduciary net position			
1. Contributions – employer	$	12,894	(2)
2. Contributions – employee		7,930	
3. Net investment income		107,187	
4. Benefit payments, including refunds of employee contributions		(53,722)	
5. Pension Plan Administrative Expense		(150)	
6. Other changes			
7. Net change in plan fiduciary net position	$	74,139	
8. Plan fiduciary net position – beginning		593,201	
9. Plan fiduciary net position – ending	**$**	**667,340**	
C. Net pension liability, *A.9. - B.9.*	**$**	**159,333**	
D. Plan fiduciary net position as a percentage of the total pension liability, *B.9. / A.9.*		**80.73%**	
E. Covered-employee payroll	**$**	**63,952**	(3)
F. Net pension liability as a percentage of covered-employee payroll, *C. / E.*		**249.14%**	

(1) Assumption changes are summarized on page 27.
(2) Includes $1,000 supplemental state aid.
(3) Assumed equal to actual member contributions divided by employee contribution rate.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear *(Dollars in Thousands)*

Last 10 Fiscal Years (which will be built prospectively)

Fiscal year ending June 30,	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Total Pension Liability										
Service Cost	$ 14,514									
Interest on the Total Pension Liability	60,183									
Benefit Changes	0									
Difference between Expected and Actual Experience	(5,771)									
Assumption Changes	30,058 (1)									
Benefit Payments	(53,697)									
Refunds	(25)									
Net Change in Total Pension Liability	$ 45,262									
Total Pension Liability - Beginning	781,411									
Total Pension Liability - Ending (a)	**$ 826,673**									
Plan Fiduciary Net Position										
Employer Contributions	$ 12,894 (2)									
Employee Contributions	7,930									
Pension Plan Net Investment Income	107,187									
Benefit Payments	(53,697)									
Refunds	(25)									
Pension Plan Administrative Expense	(150)									
Other	0									
Net Change in Plan Fiduciary Net Position	$ 74,139									
Plan Fiduciary Net Position - Beginning	593,201									
Plan Fiduciary Net Position - Ending (b)	**$ 667,340**									
Net Pension Liability - Ending (a) - (b)	$ 159,333									
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	80.73 %									
Covered-Employee Payroll	$ 63,952 (3)									
Net Pension Liability as a Percentage of Covered-Employee Payroll	249.15 %									

Notes to Schedule:

(1) Assumption changes are summarized on page 27.
(2) Includes $1,000 supplemental state aid.
(3) Assumed equal to actual member contributions divided by employee contribution rate.

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Net Pension Liability Multiyear *(Dollars in Thousands)*

Last 10 Fiscal Years (which will 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-Employee Payroll	Net Pension Liability as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(b) / (c)	(d)	(c) / (d)
2005						
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014	$ 826,673	$ 667,340	$ 159,333	80.73%	$ 63,952	249.14%

SCHEDULE OF CONTRIBUTIONS MULTIYEAR *(Dollars in Thousands)*

Last 10 Fiscal Years

FY Ending June 30,	Actuarially Determined Contribution [1]	Actual Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll	Actual Contribution as a % of Covered-Employee Payroll
	(a)	(b)	(a) - (b) = (c)	(d)	(b) / (d)
2005	$ 5,491	$ 6,670	$ (1,179)	$ 55,142	12.10%
2006	6,741	7,055	(314)	57,765	12.21
2007	11,427	7,461	3,966	61,498	12.13
2008	12,355	8,279	4,076	60,029	13.79
2009	14,999	9,178	5,821	61,511	14.92
2010	17,410	10,104	7,306	63,250	15.97
2011	14,826	9,873	4,953	63,250	15.61
2012	14,912	11,620	3,292	62,524 [2]	18.58
2013	18,711	11,482	7,229	62,121 [2]	18.48
2014	18,444	12,894 [3]	5,550	63,952 [2]	20.16

NOTES TO SCHEDULE OF CONTRIBUTIONS

Valuation Date:	June 30, 2014
Notes	(1) Actuarially determined contribution rates are calculated as of each July 1. (2) Assumed equal to actual member contributions divided by employee contribution rate. (3) Include supplemental state aid of $1,000.

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

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	23 years
Asset Valuation Method	5-Year smoothed market; no corridor
Inflation	3.00%
Salary Increases	Service based tables ranging from 8.00% with one year of service to 4.00% with 21 or more years of service, including inflation
Investment Rate of Return	8.00% through June 30, 2017; 8.50% thereafter
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study of the period 2006 - 2011, prepared by a former actuary.
Healthy Post-retirement Mortality	RP-2000 annuitant generational mortality table, projected with mortality improvement scale AA, white collar adjustment, set back two years for males and set forward one year for females.

Other Information:

Benefit Increases After Retirement	The post-retirement benefit increase is assumed to increase from 1.0% to 1.5% beginning January 1, 2018 and from 1.5% to 2.5% beginning January 1, 2033. See separate funding report as of July 1, 2014 for additional detail. To obtain this report, contact MSRS as noted on page 3.

SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

Last 10 Fiscal Years

FY Ending June 30,	Annual Return[1]
2005	
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	18.69 %

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

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

Rate of Return

For the year ended June 30, 2014, the annual money-weighted rate of return for the State Patrol Retirement Fund was 18.69%. The money-weighted rate of return is a method of calculating period-by-period returns on pension plan investments that adjusts for the changing amounts actually invested. For purposes of this schedule, the money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

10-Year Schedule of Money-Weighted Investment Return

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

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

SECTION D

ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

ASSET ALLOCATION

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method. Best estimates for expected future real rates of return (expected returns, net of inflation) are developed for each asset class using both long-term historical returns and long-term capital market expectation from a number of investment management and consulting organizations. The asset class estimates and the target allocations were then combined to produce geometric, long-term expected real rate of return for the portfolio. Inflation expectations were applied to derive the nominal rate of return for the portfolio. For each asset class that is included in the pension fund's target asset allocation as of June 30, 2014, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric)
Domestic Stocks	45.00%	5.50%
International Stocks	15.00	6.00
Bonds	18.00	1.45
Alternative Assets	20.00	6.40
Unallocated Cash	2.00	0.50
Total	100.00%	

The Minnesota State Board of Investment (SBI) compiled this data and the related investment notes and provided it to MSRS for GASB-compliance purposes. MSRS furnished this information to us for inclusion within this report. We did not audit this information. We are not responsible for its accuracy or completeness.

At MSRS' direction, for purposes of this valuation, the long-term expected rate of return assumption is 7.90%. This assumption is based on a review of inflation and investment return assumptions dated September 11, 2014.

SENSITIVITY OF NET PENSION LIABILITY TO THE SINGLE DISCOUNT RATE ASSUMPTION

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 fund's net pension liability, calculated using a single discount rate of 7.90%, as well as what the fund's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower (6.90%) or 1-percentage-point higher (8.90%) than the current rate:

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%
$256,433	$159,333	$78,388

A single discount rate of 7.90% was used for the measurement date of July 1, 2013.

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

GASB STATEMENT NO. 68 RECONCILIATION *(Dollars in Thousands)*

	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)	Deferred Outflows	Deferred Inflows	Pension Expense
Balance Beginning of Year	**$ 781,411**	**$ 593,201**	**$ 188,210**	**$ 0**	**$ 0**	
Changes for the Year:						
Service Cost	$ 14,514		$ 14,514			$ 14,514
Interest on Total Pension Liability	60,183		60,183			60,183
Interest on Fiduciary Net Position [1]		$ 45,557	(45,557)			(45,557)
Changes in Benefit Terms						
Liability Experience Gains and Losses	(5,771)		(5,771)		$ 4,809	(962)
Changes in Assumptions	30,058		30,058	$ 25,048		5,010
Contributions - Employer [2]		12,894	(12,894)			
Contributions - Employees		7,930	(7,930)			(7,930)
Asset Gain/(Loss) [1]		61,630	(61,630)		49,304	(12,326)
Benefit Payouts	(53,722)	(53,722)	0			
Administrative Expenses		(150)	150			150
Other changes		0	0			
Net Changes	**$ 45,262**	**$ 74,139**	**$ (28,877)**	**$ 25,048**	**$ 54,113**	**$ 13,082**
Balance End of Year	**$ 826,673**	**$ 667,340**	**$ 159,333**	**$ 25,048**	**$ 54,113**	

(1) The sum of these equals the net investment income of $107,187.
(2) Includes supplemental state aid of $1,000.

SUMMARY OF POPULATION STATISTICS

		Terminated		Recipients			
	Actives	Deferred Retirement	Other Non-Vested	Service Retirement	Disability Retirement	Survivor	Total
Members on 7/1/2013	**845**	**41**	**18**	**748**	**50**	**185**	**1,887**
New Members	57	0	0	0	0	0	**57**
Return to active	0	0	0	0	0	0	**0**
Terminated non-vested	(3)	0	3	0	0	0	**0**
Service retirements	(30)	(1)	0	31	0	0	**0**
Terminated deferred	(6)	6	0	0	0	0	**0**
Terminated refund/transfer	(1)	0	(6)	0	0	0	**(7)**
Deaths	0	0	0	(21)	0	(25)	**(46)**
New beneficiary	0	0	0	0	0	11	**11**
Disabled	(4)	0	0	0	4	0	**0**
Unexpected status change	0	(2)	2	18	0	(16)	**2**
Net change	13	3	(1)	28	4	(30)	**17**
Members on 6/30/2014	**858**	**44**	**17**	**776**	**54**	**155**	**1,904**

SECTION E

SUMMARY OF BENEFITS

Summary of Plan Provisions

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

Plan year	July 1 through June 30
Eligibility	State troopers, conservation officers, certain crime bureau and gambling enforcement officers, and certain other persons listed in Minnesota Statutes 352B.011 subdivision 10.
Contributions	Percent of Salary **Effective Date** / **Member** / **Employer** July 1, 2011 – June 30, 2014: 12.40% / 18.60% July 1, 2014 – June 30, 2016: 13.40% / 20.10% July 1, 2016 and later: 14.40% / 21.60% Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).
State Contributions	$1 million paid annually on October 1 until both the Public Employees Retirement Association Police and Fire Plan and the State Patrol Plan become 90% funded (on a Market Value of Assets basis).
Allowable service	Service during which member contributions were deducted. Includes period receiving temporary Worker's Compensation and reduced salary from employer. See Normal Retirement benefit definition below for information about service limits.
Salary	Salaries excluding lump sum payments at separation.
Average salary	Average of the five highest years of Salary. Average Salary is based on all Allowable Service if less than five years. Average Salary is based on all years without regard to any service limits.

Retirement

Normal retirement benefit

Age/Service requirement	Age 55 and three years (ten years if first hired after June 30, 2013) of Allowable Service.
Amount	3.00% of Average Salary for each year of Allowable Service up to 33 years. Members with at least 28 years of service as of July 1, 2013 are not subject to this service limit. Member contributions made after the service cap will be refunded at retirement.

Early retirement benefit

Age/Service requirement	Age 50 and three years (ten years if first hired after June 30, 2013) of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement reduced by 1/10% for each month that the member is under age 55. If the effective date of retirement is after June 30, 2015, the reduction is 0.34% for each month that the member is under age 55 at the time of retirement.
Form of payment	Life annuity. Actuarially equivalent options are: 50%, 75%, or 100% Joint and Survivor, or 15-year certain. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan.

Summary of Plan Provisions (Continued)

Retirement (Concluded)	
Benefit increases	Since January 1, 2014, benefit recipients receive annual 1.0% benefit increases. When the funding ratio reaches 85% for two consecutive years, the benefit increase will increase to 1.5%; the benefit will revert to 2.5% when the funding ratio reaches 90% for two consecutive years (funding ratio is determined using Market Value of Assets). A benefit recipient who has been receiving a benefit for at least 18 full months as of the January 1 increase will receive a full increase. Members receiving benefits for at least six months but less than 18 full months as of the January 1 increase will receive a pro rata increase.
Disability	
Occupational disability benefit	
Age/Service requirement	Member who cannot perform his duties as a direct result of a disability relating to an act of duty.
Amount	60% of Average Salary plus 3.00% of Average Salary for each year in excess of 20 years of Allowable Service (pro rata for completed months). Payments cease at age 65 or earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability.
Non-duty disability benefit	
Age/Service requirement	At least one year of Allowable Service and disability not related to covered employment.
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 15 years) and Average Salary at disability without reduction for commencement before age 55. Payments cease at age 65 or earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability.
Retirement after disability	
Age/Service requirement	Age 65 with continued disability.
Amount	Optional annuity continues. Otherwise, normal retirement benefit equal to the disability benefit paid, or an actuarially equivalent option.
Form of payment	Same as for retirement.
Benefit increases	Same as for retirement.

Summary of Plan Provisions (Continued)

Death

Surviving spouse benefit

Age/Service requirement	Member who is active or receiving a disability benefit or former member.
Amount	50% of Average Salary if member was active or occupational disability and either had less than three years (five years if first hired after June 30, 2013) of Allowable Service or was under age 55. Annuity is paid for life. Surviving spouse receives the 100% joint and survivor benefit commencing on the member's 55th birthday if member was active or a disability with three years (five years if first hired after June 30, 2013) of Allowable Service. A spouse who had been receiving the 50% benefit shall be entitled to the greater benefit. The surviving spouse of a former member receives the 100% joint and survivor benefit commencing on the member's 55th birthday if former member had three years (five years if first hired after June 30, 2013) of Allowable Service.
Benefit increases	Same as for retirement

Surviving dependent children's benefit

Age/Service requirement	Member who is active or receiving a disability benefit. Child must be unmarried, under age 18 (or 23 if full-time student) and dependent upon the member.
Amount	10% of Average Salary for each child and $20 per month prorated among all dependent children. Benefit must not be less than 50% nor exceed 70% of Average Salary.
Benefit increases	Same as for retirement.

Refund of contributions

Age/Service requirement	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	Member contributions with 6.00% interest compounded daily until June 30, 2011, and 4.00% thereafter.

Summary of Plan Provisions (Continued)

Termination	
Refund of contributions	
Age/service requirement	Termination of state service.
Amount	Member contributions with 6.00% interest compounded daily to June 30, 2011, and 4.00% thereafter. If a member is vested, a deferred annuity may be elected in lieu of a refund.
Deferred benefit	
Age/service requirement	Three years (ten years if first hired after June 30, 2013) of Allowable Service.
Amount	Benefit is computed under law in effect at termination and increased by the following annual augmentation percentage: (a.) 0.00% before July 1, 1971; (b.) 5.00% from July 1, 1971 to January 1, 1981; (c.) 3.00% thereafter (2.50% if hired after June 30, 2006) until January 1, 2012; and (d.) 2.00% after December 31, 2011 until the annuity begins. Amount is payable at normal or early retirement. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Optional form conversion factors	Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, set back two years for males and set forward one year for females, blended 95% males, and 6.5% interest.
Combined service annuity	Members are eligible for combined service benefits if they: (a.) Have sufficient allowable service in total that equals or exceeds the applicable service credit vesting requirement of the retirement plan with the longest applicable service credit vesting requirement; and (b.) Have at least six months of allowable service credit in each plan worked under; and (c.) Are not in receipt of a benefit from another plan, or have applied for benefits with an effective date within one year. Members who meet the above requirements must have their benefit based on the following: (a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement. (b.) Average salary is based on the high five consecutive years during their entire service in all covered plans.

Summary of Plan Provisions (Concluded)

Contribution stabilizer	The following is a summary of contribution stabilizer provisions in Minnesota Statute 352.045: • If a contribution sufficiency of at least 1.0% has existed for two consecutive years, member contributions are decreased by at most 0.25% and employer contributions are decreased by at most 0.375% to a level that is necessary to maintain a 2.0% sufficiency. A contribution rate decrease under this section must not be made until at least two years have passed since fully implementing a previous decrease. • If a contribution deficiency of at least 0.5% has existed for two consecutive years, the member and employer contribution rates are increased as follows: o If the contribution deficiency is less than 2.0%, member contributions are increased 0.25% and employer contributions are increased by 0.375%. o If the contribution deficiency is greater than 1.99% and less than 4.01%, member contributions are increased 0.50% and employer contributions are increased by 0.75%. o If the contribution deficiency is greater than 4.0%, member contributions are increased by 0.75% and employer contributions are increased by 1.125%.
Changes in plan provisions	Effective July 1, 2014, the funding ratio threshold that must be attained to pay a 1.5% post-retirement benefit increase to benefit recipients was changed from 85% for one year to 85% for two consecutive years. The funding ratio threshold that must be attained to pay a 2.5% post-retirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years. The interest assumption used to determine optional form conversion factors was changed from an actuarial equivalent rate consistent with the post-retirement discount rate to a fixed rate of 6.5%.

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; and

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

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

Valuation of Future Post-Retirement Benefit Increases

Benefit recipients receive a future annual 1.0% post-retirement benefit increase. If the funding ratio reaches 85% (based on a 1.5% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will increase to 1.5%, 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%.

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% through June 30, 2017; 8.50% thereafter
    - Statutory salary increases (rate of 8% at year 1 declining to 4% at years 21 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The post-retirement benefit increase rate is assumed to be 1.00% per year until the funding ratio threshold required to pay a 1.50% post-retirement benefit increase is reached and is then assumed to be 1.50% until the threshold required to pay a 2.50% post-retirement increase is reached.
- Current statutory contributions (i.e., not including potential contribution increases under the contribution stabilizer statutes) as directed by MSRS.

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold required to pay 1.50% post-retirement benefit increase in the year 2018 and 2.5% in 2045, and that the plan would begin paying 1.50% benefit increases on January 1, 2019 and 2.50% on January 1, 2046. This assumption is reflected in our calculations.

To determine the Total Pension Liability as of July 1, 2013, we performed a similar projection, and assumed the plan would pay the 1.00% benefit increases indefinitely.

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. All demographic actuarial assumptions are prescribed by Minnesota Statutes, the Legislative Commission on Pensions and Retirement (LCPR), or the MSRS Board of Directors. These parties are responsible for selecting the assumptions used for this valuation. The demographic assumptions prescribed are based on the last experience study, dated February 2012, prepared by a former actuary. The economic assumptions are based on a review of inflation and investment return assumptions dated September 11, 2014.

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 2018, 1.50% per annum from 2019 to 2045, 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.
Inflation	2.75% per year.
Payroll growth	3.50% per year.
Mortality rates	
Healthy Pre-retirement	RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment.
Healthy Post-retirement	RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back two years for males and set forward one year for females.
	The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50.
Disabled	RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment, set back two years for males and set forward one year for females.
Retirement	Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year.

Summary of Actuarial Assumptions (Continued)

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 — 5% 2 — 2% 3 — 2%
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	For purposes of the Projection of Plan Fiduciary Net Position, 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	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. Account balances for deferred members accumulate interest until normal retirement date and are discounted back to the valuation date.
Commencement of deferred benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 55.
Percentage married	85% of active members are assumed to be married. Actual marital status is used for members in payment status.
Age of spouse	Females are assumed to be two years younger than their male spouses.
Eligible children	Each member may have two dependent children depending on member's age. Assumed first born child born at member's age 28 and second born child at member's age 31.
Form of payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 15% elect 50% Joint & Survivor option 25% elect 75% Joint & Survivor option 35% elect 100% Joint & Survivor option Females: 25% elect 50% Joint & Survivor option 30% elect 75% Joint & Survivor option 5% elect 100% Joint & Survivor option Remaining married members and unmarried members are assumed to elect the Straight Life option.
Eligibility testing	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement operation	Withdrawal decrements do not operate during retirement eligibility.
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 MSRS. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided. There are no members reported with missing gender or birth dates. In cases where submitted data was missing or incomplete, the following assumptions were applied: <u>Data for active members</u>: There were no members reported with missing salary and no members reported with missing service. <u>Data for terminated members</u>: There was 1 member reported without a benefit. We calculated benefits for this member using the reported Credited Service and Termination Date. Average Salary was not reported, so we assumed a value of $35,000. <u>Data for members receiving benefits</u>: There were no members reported without a benefit. There were no survivors reported with an expired benefit. There were 5 retirees reported with a bounce back annuity but were not reported with a reasonable reduction factor. A factor of 0.80, 0.85 and 0.90 was assumed for the 100%, 75% and 50% joint and survivor annuity, respectively. There were 10 retirees reported with a survivor option and a survivor date of death. We assumed no benefit was payable to the survivor, and the member benefit already reflected the increase to the life annuity value (i.e., "bounce back"), if applicable. For retirees that elected a survivor benefit option, we used the valuation assumptions if the survivor date of birth was missing or invalid (220 members) and/or the survivor gender was missing or invalid (238 members). At MSRS' direction, we changed the status of 18 members who were reported with a disabled status at the beginning of the year and a retired status at the end of the year back to disabled status.
Changes in actuarial assumptions	As of July 1, 2013, the post-retirement benefit increase rate is assumed to be 1% indefinitely. As of July 1, 2014, the benefit increase rate is assumed to increase from 1% to 1.5% on January 1, 2019, and from 1.5% to 2.5% on January 1, 2046.

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%	0.03%	0.02%
25	0.04	0.02	0.04	0.02	0.04	0.02
30	0.04	0.03	0.04	0.03	0.04	0.03
35	0.05	0.05	0.06	0.05	0.05	0.05
40	0.08	0.07	0.09	0.06	0.08	0.07
45	0.11	0.11	0.13	0.10	0.11	0.11
50	0.17	0.25	0.20	0.16	0.17	0.25
55	0.57	0.39	0.27	0.24	0.57	0.39
60	0.57	0.61	0.43	0.38	0.57	0.61
65	0.92	1.01	0.67	0.59	0.92	1.01
70	1.58	1.69	0.98	0.88	1.58	1.69

* *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 note that the prescribed assumption 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	1.47%	1.47%	0.03%	0.03%
25	1.13	1.13	0.05	0.05
30	0.80	0.80	0.06	0.06
35	0.47	0.47	0.09	0.09
40	0.40	0.40	0.14	0.14
45	0.40	0.40	0.23	0.23
50	0.00	0.00	0.40	0.40
55	0.00	0.00	0.70	0.70
60	0.00	0.00	1.13	1.13
65	0.00	0.00	0.00	0.00

Summary of Actuarial Assumptions (Concluded)

Age	Retirement	Salary Scale Year	Salary Scale Increase
50	7 %	1	7.75%
51	6	2	7.25
52	6	3	6.75
53	6	4	6.50
54	3	5	6.25
55	65	6	6.00
56	50	7	5.75
57	30	8	5.60
58	20	9	5.45
59	20	10	5.30
60+	100	11	5.15
		12	5.00
		13	4.85
		14	4.70
		15	4.55
		16	4.40
		17	4.25
		18	4.10
		19	3.95
		20	3.80
		21+	3.75

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

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

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the plan fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve Board (FRB)) 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 4.29% (based on the FRB rate as of June 26, 2014). The Plan's Fiduciary Net Position was projected to be available to meet all projected future benefit payments of current active and inactive employees. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability. **The resulting single discount rate as of July 1, 2014 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.

We performed a similar analysis as of July 1, 2013. Based on the long-term expected rate of return of 7.90% and a municipal bond rate of 4.29% (based on the FRB rate as of June 27, 2013); the Plan's Fiduciary Net Position was projected to be available to meet all projected future benefit payments of current active and inactive employees. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability. **The resulting single discount rate as of July 1, 2013 is 7.90%.**

SINGLE DISCOUNT RATE DEVELOPMENT

Projection of Contributions *(Dollars in Thousands)*

	Projected Covered-Employee 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*	Additional State Contributions	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)	(g)	(h) = (d) + (e) + (f) + (g)
0	$ 63,952		$ 63,952					
1	68,574		68,574	$ 9,189	$ 13,783		$ 1,000	$ 23,972
2	67,587	$ 3,387	70,974	9,057	13,585	$ 314	1,000	22,956
3	66,399	7,059	73,458	9,561	14,342	830	1,000	24,733
4	65,440	10,589	76,029	9,423	14,135	1,245	1,000	24,803
5	64,573	14,117	78,690	9,299	13,948	1,660	1,000	24,907
6	63,691	17,753	81,444	9,171	13,757	2,088	1,000	25,016
7	62,731	21,564	84,295	9,033	13,550	2,536	1,000	25,119
8	61,998	25,247	87,245	8,928	13,392	2,969	1,000	25,289
9	60,940	29,359	90,299	8,775	13,163	3,453	1,000	25,391
10	59,276	34,183	93,459	8,536	12,804	4,020	1,000	25,360
11	57,224	39,506	96,730	8,240	12,360	4,646	1,000	25,246
12	54,814	45,302	100,116	7,893	11,840	5,328	1,000	25,061
13	52,241	51,379	103,620	7,523	11,284	6,042	1,000	24,849
14	49,399	57,848	107,247	7,113	10,670	6,803	1,000	24,586
15	46,294	64,706	111,000	6,666	10,000	7,609	1,000	24,275
16	43,148	71,737	114,885	6,213	9,320	8,436	1,000	23,969
17	39,933	78,973	118,906	5,750	8,626	9,287	1,000	23,663
18	36,505	86,563	123,068	5,257	7,885	10,180	1,000	23,322
19	33,036	94,340	127,376	4,757	7,136	11,094	1,000	22,987
20	29,861	101,973	131,834	4,300	6,450	11,992	1,000	22,742
21	26,715	109,733	136,448	3,847	5,770	12,905	1,000	22,522
22	23,620	117,603	141,223	3,401	5,102	13,830	1,000	22,333
23	20,772	125,394	146,166	2,991	4,487	14,746	1,000	22,224
24	18,226	133,056	151,282	2,625	3,937	15,647	1,000	22,209
25	15,801	140,776	156,577	2,275	3,413	16,555	1,000	22,243
26	13,167	148,890	162,057	1,896	2,844	17,509	1,000	22,249
27	10,511	157,218	167,729	1,514	2,270	18,489	1,000	22,273
28	7,965	165,635	173,600	1,147	1,720	19,479	1,000	22,346
29	5,783	173,893	179,676	833	1,249	20,450	1,000	22,532
30	4,170	181,794	185,964	601	901	21,379	1,000	22,881
31	2,863	189,610	192,473	412	618	22,298	1,000	23,328
32	1,735	197,475	199,210	250	375	23,223	1,000	23,848
33	945	205,237	206,182	136	204	24,136	0	24,476
34	510	212,888	213,398	73	110	25,036	0	25,219
35	283	220,584	220,867	41	61	25,941	0	26,043
36	153	228,445	228,598	22	33	26,865	0	26,920
37	61	236,538	236,599	9	13	27,817	0	27,839
38	17	244,863	244,880	2	4	28,796	0	28,802
39	4	253,446	253,450	1	1	29,805	0	29,807
40	0	262,321	262,321	0	0	30,849	0	30,849
41	0	271,502	271,502	0	0	31,929	0	31,929
42	0	281,005	281,005	0	0	33,046	0	33,046
43	0	290,840	290,840	0	0	34,203	0	34,203
44	0	301,020	301,020	0	0	35,400	0	35,400
45	0	311,555	311,555	0	0	36,639	0	36,639
46	0	322,460	322,460	0	0	37,921	0	37,921
47	0	333,746	333,746	0	0	39,248	0	39,248
48	0	345,427	345,427	0	0	40,622	0	40,622
49	0	357,517	357,517	0	0	42,044	0	42,044
50	0	370,030	370,030	0	0	43,516	0	43,516

**Contributions related to future employees in excess of normal cost and expenses of 24.24% of pay.*

For purposes of this projection, based on GASB guidance, we assumed the current contribution rates 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 (continued) *(Dollars in Thousands)*

	Projected Covered-Employee 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*	Additional State Contributions	Total Contributions
	(a)	(b)	(c) = (a) + (b)	(d)	(e)	(f)	(g)	(h) = (d) + (e) + (f) + (g)
51	$ 0	$ 382,981	$ 382,981	$ 0	$ 0	$ 45,039	$ 0	$ 45,039
52	0	396,385	396,385	0	0	46,615	0	46,615
53	0	410,259	410,259	0	0	48,246	0	48,246
54	0	424,618	424,618	0	0	49,935	0	49,935
55	0	439,479	439,479	0	0	51,683	0	51,683
56	0	454,861	454,861	0	0	53,492	0	53,492
57	0	470,781	470,781	0	0	55,364	0	55,364
58	0	487,259	487,259	0	0	57,302	0	57,302
59	0	504,313	504,313	0	0	59,307	0	59,307
60	0	521,964	521,964	0	0	61,383	0	61,383
61	0	540,232	540,232	0	0	63,531	0	63,531
62	0	559,141	559,141	0	0	65,755	0	65,755
63	0	578,710	578,710	0	0	68,056	0	68,056
64	0	598,965	598,965	0	0	70,438	0	70,438
65	0	619,929	619,929	0	0	72,904	0	72,904
66	0	641,627	641,627	0	0	75,455	0	75,455
67	0	664,084	664,084	0	0	78,096	0	78,096
68	0	687,326	687,326	0	0	80,830	0	80,830
69	0	711,383	711,383	0	0	83,659	0	83,659
70	0	736,281	736,281	0	0	86,587	0	86,587
71	0	762,051	762,051	0	0	89,617	0	89,617
72	0	788,723	788,723	0	0	92,754	0	92,754
73	0	816,328	816,328	0	0	96,000	0	96,000
74	0	844,900	844,900	0	0	99,360	0	99,360
75	0	874,471	874,471	0	0	102,838	0	102,838
76	0	905,078	905,078	0	0	106,437	0	106,437
77	0	936,755	936,755	0	0	110,162	0	110,162
78	0	969,542	969,542	0	0	114,018	0	114,018
79	0	1,003,476	1,003,476	0	0	118,009	0	118,009
80	0	1,038,597	1,038,597	0	0	122,139	0	122,139
81	0	1,074,948	1,074,948	0	0	126,414	0	126,414
82	0	1,112,572	1,112,572	0	0	130,838	0	130,838
83	0	1,151,512	1,151,512	0	0	135,418	0	135,418
84	0	1,191,814	1,191,814	0	0	140,157	0	140,157
85	0	1,233,528	1,233,528	0	0	145,063	0	145,063
86	0	1,276,701	1,276,701	0	0	150,140	0	150,140
87	0	1,321,386	1,321,386	0	0	155,395	0	155,395
88	0	1,367,635	1,367,635	0	0	160,834	0	160,834
89	0	1,415,502	1,415,502	0	0	166,463	0	166,463
90	0	1,465,044	1,465,044	0	0	172,289	0	172,289
91	0	1,516,321	1,516,321	0	0	178,319	0	178,319
92	0	1,569,392	1,569,392	0	0	184,561	0	184,561
93	0	1,624,321	1,624,321	0	0	191,020	0	191,020
94	0	1,681,172	1,681,172	0	0	197,706	0	197,706
95	0	1,740,013	1,740,013	0	0	204,626	0	204,626
96	0	1,800,913	1,800,913	0	0	211,787	0	211,787
97	0	1,863,945	1,863,945	0	0	219,200	0	219,200
98	0	1,929,184	1,929,184	0	0	226,872	0	226,872
99	0	1,996,705	1,996,705	0	0	234,813	0	234,813
100	0	2,066,590	2,066,590	0	0	243,031	0	243,031

**Contributions related to future employees in excess of normal cost and expenses of 24.24% of pay.*

For purposes of this projection, based on GASB guidance, we assumed the current contribution rates 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 Fiduciary 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	$ 667,340	$ 23,972	$ 54,313	$ 158	$ 51,538	$ 688,379
2	688,379	22,956	56,205	155	53,126	708,101
3	708,101	24,733	58,063	153	54,760	729,378
4	729,378	24,803	59,541	151	56,466	750,955
5	750,955	24,907	61,151	149	58,191	772,753
6	772,753	25,016	63,082	146	59,922	794,463
7	794,463	25,119	64,875	144	61,650	816,213
8	816,213	25,289	66,474	143	63,392	838,277
9	838,277	25,391	68,117	140	65,155	860,566
10	860,566	25,360	70,013	136	66,920	882,697
11	882,697	25,246	72,110	132	68,662	904,363
12	904,363	25,061	74,296	126	70,361	925,363
13	925,363	24,849	76,586	120	72,002	945,508
14	945,508	24,586	79,048	114	73,567	964,499
15	964,499	24,275	81,521	106	75,039	982,186
16	982,186	23,969	84,057	99	76,406	998,405
17	998,405	23,663	86,575	92	77,657	1,013,058
18	1,013,058	23,322	89,253	84	78,777	1,025,820
19	1,025,820	22,987	91,786	76	79,753	1,036,698
20	1,036,698	22,742	94,017	69	80,596	1,045,950
21	1,045,950	22,522	96,111	61	81,316	1,053,616
22	1,053,616	22,333	98,063	54	81,918	1,059,750
23	1,059,750	22,224	99,800	48	82,411	1,064,537
24	1,064,537	22,209	101,197	42	82,813	1,068,320
25	1,068,320	22,243	102,399	36	83,146	1,071,274
26	1,071,274	22,249	103,675	30	83,410	1,073,228
27	1,073,228	22,273	104,936	24	83,595	1,074,136
28	1,074,136	22,346	106,100	18	83,704	1,074,068
29	1,074,068	22,532	106,834	13	83,757	1,073,510
30	1,073,510	22,881	107,019	10	83,798	1,073,160
31	1,073,160	23,328	106,915	7	83,871	1,073,437
32	1,073,437	23,848	107,036	4	83,987	1,074,232
33	1,074,232	24,476	107,202	2	84,108	1,075,612
34	1,075,612	25,219	106,942	1	84,256	1,078,144
35	1,078,144	26,043	106,374	1	84,510	1,082,322
36	1,082,322	26,920	105,644	0	84,903	1,088,501
37	1,088,501	27,839	104,735	0	85,461	1,097,066
38	1,097,066	28,802	103,649	0	86,218	1,108,437
39	1,108,437	29,807	102,434	0	87,202	1,123,012
40	1,123,012	30,849	101,085	0	88,446	1,141,222
41	1,141,222	31,929	99,608	0	89,984	1,163,527
42	1,163,527	33,046	97,997	0	91,851	1,190,427
43	1,190,427	34,203	96,253	0	94,089	1,222,466
44	1,222,466	35,400	94,374	0	96,739	1,260,231
45	1,260,231	36,639	92,355	0	99,849	1,304,364
46	1,304,364	37,921	90,188	0	103,469	1,355,566
47	1,355,566	39,248	87,874	0	107,655	1,414,595
48	1,414,595	40,622	85,404	0	112,467	1,482,280
49	1,482,280	42,044	82,767	0	117,972	1,559,529
50	1,559,529	43,516	79,960	0	124,240	1,647,325

For purposes of this projection, based on GASB guidance, we assumed the current contribution rates 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 (continued)

(Dollars in Thousands)

Year	Projected Beginning Plan Fiduciary 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	$ 1,647,325	$ 45,039	$ 76,984	$ 0	$ 131,350	$ 1,746,730
52	1,746,730	46,615	73,841	0	139,386	1,858,890
53	1,858,890	48,246	70,533	0	148,438	1,985,041
54	1,985,041	49,935	67,073	0	158,604	2,126,507
55	2,126,507	51,683	63,480	0	169,986	2,284,696
56	2,284,696	53,492	59,774	0	182,697	2,461,111
57	2,461,111	55,364	55,979	0	196,853	2,657,349
58	2,657,349	57,302	52,127	0	212,581	2,875,105
59	2,875,105	59,307	48,255	0	230,011	3,116,168
60	3,116,168	61,383	44,392	0	249,285	3,382,444
61	3,382,444	63,531	40,565	0	270,552	3,675,962
62	3,675,962	65,755	36,806	0	293,972	3,998,883
63	3,998,883	68,056	33,139	0	319,714	4,353,514
64	4,353,514	70,438	29,585	0	347,960	4,742,327
65	4,742,327	72,904	26,168	0	378,904	5,167,967
66	5,167,967	75,455	22,915	0	412,755	5,633,262
67	5,633,262	78,096	19,849	0	449,734	6,141,243
68	6,141,243	80,830	16,991	0	490,082	6,695,164
69	6,695,164	83,659	14,362	0	534,053	7,298,514
70	7,298,514	86,587	11,975	0	581,923	7,955,049
71	7,955,049	89,617	9,841	0	633,990	8,668,815
72	8,668,815	92,754	7,965	0	690,571	9,444,175
73	9,444,175	96,000	6,347	0	752,013	10,285,841
74	10,285,841	99,360	4,976	0	818,688	11,198,913
75	11,198,913	102,838	3,837	0	891,000	12,188,914
76	12,188,914	106,437	2,910	0	969,385	13,261,826
77	13,261,826	110,162	2,170	0	1,054,319	14,424,137
78	14,424,137	114,018	1,593	0	1,146,313	15,682,875
79	15,682,875	118,009	1,153	0	1,245,925	17,045,656
80	17,045,656	122,139	822	0	1,353,757	18,520,730
81	18,520,730	126,414	578	0	1,470,463	20,117,029
82	20,117,029	130,838	401	0	1,596,749	21,844,215
83	21,844,215	135,418	276	0	1,733,379	23,712,736
84	23,712,736	140,157	188	0	1,881,180	25,733,885
85	25,733,885	145,063	127	0	2,041,043	27,919,864
86	27,919,864	150,140	84	0	2,213,934	30,283,854
87	30,283,854	155,395	56	0	2,400,893	32,840,086
88	32,840,086	160,834	36	0	2,603,047	35,603,931
89	35,603,931	166,463	23	0	2,821,610	38,591,981
90	38,591,981	172,289	15	0	3,057,892	41,822,147
91	41,822,147	178,319	10	0	3,313,309	45,313,765
92	45,313,765	184,561	6	0	3,589,388	49,087,708
93	49,087,708	191,020	4	0	3,887,780	53,166,504
94	53,166,504	197,706	2	0	4,210,264	57,574,472
95	57,574,472	204,626	1	0	4,558,762	62,337,859
96	62,337,859	211,787	1	0	4,935,347	67,484,992
97	67,484,992	219,200	0	0	5,342,258	73,046,450
98	73,046,450	226,872	0	0	5,781,910	79,055,232
99	79,055,232	234,813	0	0	6,256,912	85,546,957
100	85,546,957	243,031	0	0	6,770,077	92,560,065

For purposes of this projection, based on GASB guidance, we assumed the current contribution rates 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 Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
1	$ 667,340	$ 54,313	$ 54,313	$ 0	$ 52,287	$ 0	$ 52,287
2	688,379	56,205	56,205	0	50,147	0	50,147
3	708,101	58,063	58,063	0	48,011	0	48,011
4	729,378	59,541	59,541	0	45,629	0	45,629
5	750,955	61,151	61,151	0	43,431	0	43,431
6	772,753	63,082	63,082	0	41,523	0	41,523
7	794,463	64,875	64,875	0	39,577	0	39,577
8	816,213	66,474	66,474	0	37,583	0	37,583
9	838,277	68,117	68,117	0	35,692	0	35,692
10	860,566	70,013	70,013	0	33,999	0	33,999
11	882,697	72,110	72,110	0	32,454	0	32,454
12	904,363	74,296	74,296	0	30,990	0	30,990
13	925,363	76,586	76,586	0	29,606	0	29,606
14	945,508	79,048	79,048	0	28,320	0	28,320
15	964,499	81,521	81,521	0	27,068	0	27,068
16	982,186	84,057	84,057	0	25,867	0	25,867
17	998,405	86,575	86,575	0	24,691	0	24,691
18	1,013,058	89,253	89,253	0	23,591	0	23,591
19	1,025,820	91,786	91,786	0	22,484	0	22,484
20	1,036,698	94,017	94,017	0	21,345	0	21,345
21	1,045,950	96,111	96,111	0	20,222	0	20,222
22	1,053,616	98,063	98,063	0	19,122	0	19,122
23	1,059,750	99,800	99,800	0	18,036	0	18,036
24	1,064,537	101,197	101,197	0	16,950	0	16,950
25	1,068,320	102,399	102,399	0	15,895	0	15,895
26	1,071,274	103,675	103,675	0	14,915	0	14,915
27	1,073,228	104,936	104,936	0	13,991	0	13,991
28	1,074,136	106,100	106,100	0	13,111	0	13,111
29	1,074,068	106,834	106,834	0	12,235	0	12,235
30	1,073,510	107,019	107,019	0	11,359	0	11,359
31	1,073,160	106,915	106,915	0	10,517	0	10,517
32	1,073,437	107,036	107,036	0	9,758	0	9,758
33	1,074,232	107,202	107,202	0	9,057	0	9,057
34	1,075,612	106,942	106,942	0	8,374	0	8,374
35	1,078,144	106,374	106,374	0	7,720	0	7,720
36	1,082,322	105,644	105,644	0	7,105	0	7,105
37	1,088,501	104,735	104,735	0	6,528	0	6,528
38	1,097,066	103,649	103,649	0	5,988	0	5,988
39	1,108,437	102,434	102,434	0	5,484	0	5,484
40	1,123,012	101,085	101,085	0	5,016	0	5,016
41	1,141,222	99,608	99,608	0	4,581	0	4,581
42	1,163,527	97,997	97,997	0	4,177	0	4,177
43	1,190,427	96,253	96,253	0	3,802	0	3,802
44	1,222,466	94,374	94,374	0	3,455	0	3,455
45	1,260,231	92,355	92,355	0	3,133	0	3,133
46	1,304,364	90,188	90,188	0	2,836	0	2,836
47	1,355,566	87,874	87,874	0	2,561	0	2,561
48	1,414,595	85,404	85,404	0	2,307	0	2,307
49	1,482,280	82,767	82,767	0	2,072	0	2,072
50	1,559,529	79,960	79,960	0	1,855	0	1,855

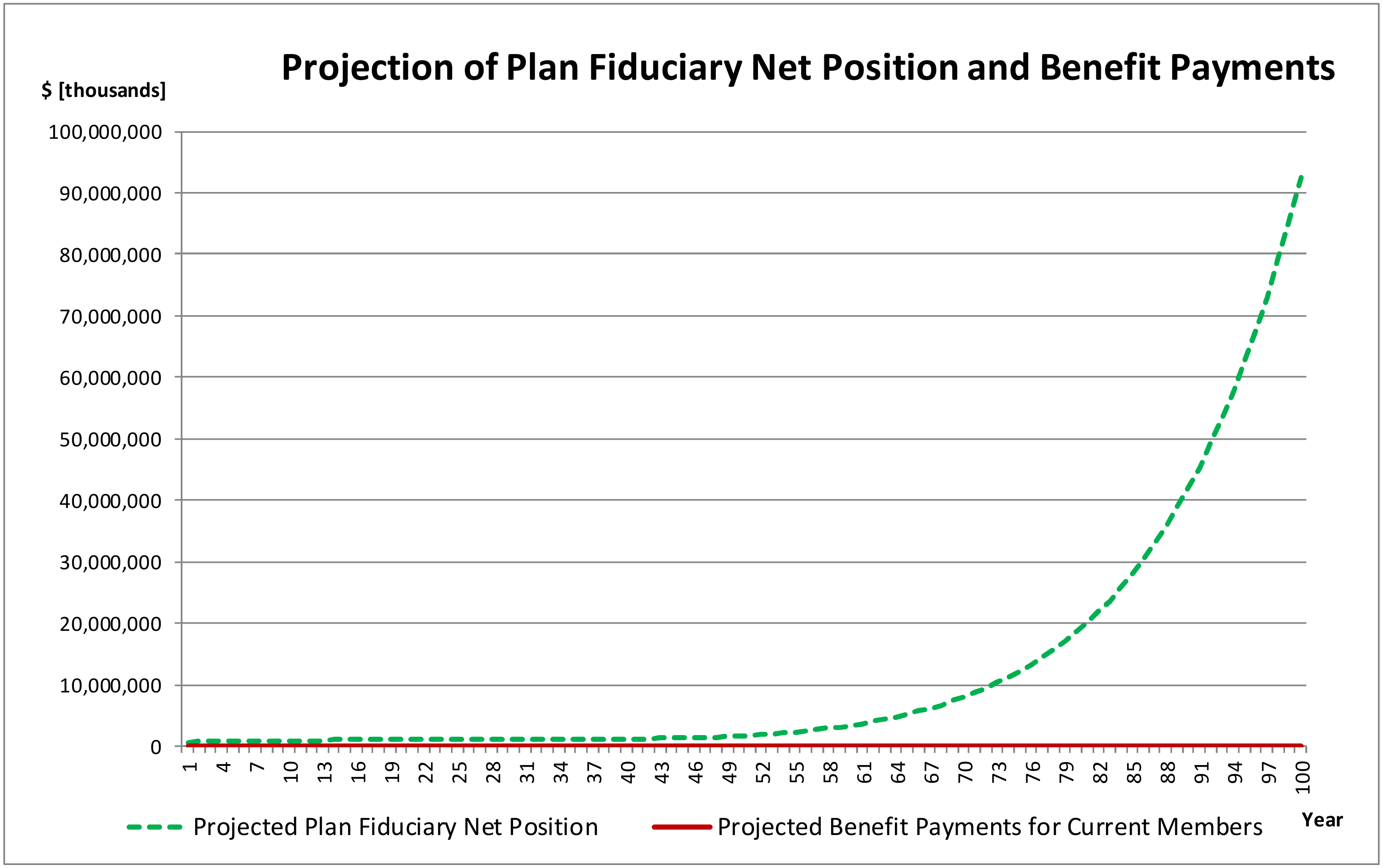
For purposes of this projection, based on GASB guidance, we assumed the current contribution rates would continue after the plan becomes fully funded. If we reflected a decrease in contribution rates due to full funding, future assets and contributions would be less than what is shown herein.

SINGLE DISCOUNT RATE DEVELOPMENT

Present Values of Projected Benefits (continued) *(Dollars in Thousands)*

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
51	$ 1,647,325	$ 76,984	$ 76,984	$ 0	$ 1,655	$ 0	$ 1,655
52	1,746,730	73,841	73,841	0	1,471	0	1,471
53	1,858,890	70,533	70,533	0	1,302	0	1,302
54	1,985,041	67,073	67,073	0	1,148	0	1,148
55	2,126,507	63,480	63,480	0	1,007	0	1,007
56	2,284,696	59,774	59,774	0	879	0	879
57	2,461,111	55,979	55,979	0	763	0	763
58	2,657,349	52,127	52,127	0	658	0	658
59	2,875,105	48,255	48,255	0	565	0	565
60	3,116,168	44,392	44,392	0	481	0	481
61	3,382,444	40,565	40,565	0	408	0	408
62	3,675,962	36,806	36,806	0	343	0	343
63	3,998,883	33,139	33,139	0	286	0	286
64	4,353,514	29,585	29,585	0	237	0	237
65	4,742,327	26,168	26,168	0	194	0	194
66	5,167,967	22,915	22,915	0	157	0	157
67	5,633,262	19,849	19,849	0	126	0	126
68	6,141,243	16,991	16,991	0	100	0	100
69	6,695,164	14,362	14,362	0	79	0	79
70	7,298,514	11,975	11,975	0	61	0	61
71	7,955,049	9,841	9,841	0	46	0	46
72	8,668,815	7,965	7,965	0	35	0	35
73	9,444,175	6,347	6,347	0	26	0	26
74	10,285,841	4,976	4,976	0	19	0	19
75	11,198,913	3,837	3,837	0	13	0	13
76	12,188,914	2,910	2,910	0	9	0	9
77	13,261,826	2,170	2,170	0	6	0	6
78	14,424,137	1,593	1,593	0	4	0	4
79	15,682,875	1,153	1,153	0	3	0	3
80	17,045,656	822	822	0	2	0	2
81	18,520,730	578	578	0	1	0	1
82	20,117,029	401	401	0	1	0	1
83	21,844,215	276	276	0	1	0	1
84	23,712,736	188	188	0	0	0	0
85	25,733,885	127	127	0	0	0	0
86	27,919,864	84	84	0	0	0	0
87	30,283,854	56	56	0	0	0	0
88	32,840,086	36	36	0	0	0	0
89	35,603,931	23	23	0	0	0	0
90	38,591,981	15	15	0	0	0	0
91	41,822,147	10	10	0	0	0	0
92	45,313,765	6	6	0	0	0	0
93	49,087,708	4	4	0	0	0	0
94	53,166,504	2	2	0	0	0	0
95	57,574,472	1	1	0	0	0	0
96	62,337,859	1	1	0	0	0	0
97	67,484,992	0	0	0	0	0	0
98	73,046,450	0	0	0	0	0	0
99	79,055,232	0	0	0	0	0	0
100	85,546,957	0	0	0	0	0	0
				Totals	$ 968,544		$ 968,544

For purposes of this projection, based on GASB guidance, we assumed the current contribution rates 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.


Projection of Plan Fiduciary Net Position and Benefit Payments
$ [thousands]
100,000,000
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
Year
Projected Plan Fiduciary Net Position
Projected Benefit Payments for Current Members

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

Fiduciary Net Position	The fiduciary net position is the value of the net assets of the trust restricted for pension benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. 68 plan members are not considered non-employer 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 Outflow (Inflow) of Resources due to Assumption Changes 10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments
Total Pension Liability (TPL)	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability (UAAL)	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	The valuation assets are the plan fiduciary net position used in determining the net position liability of the plan. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.