

Educational Employees' Supplementary
Retirement System of Fairfax County (ERFC)
GASB Statement Nos. 67 and 68 Accounting and
Financial Reporting for Pensions
June 30, 2017





October 10, 2017

Board of Trustees
Educational Employees' Supplementary
Retirement System of Fairfax County (ERFC)
Fairfax, Virginia

Re: GASB Statement Nos. 67 and 68 Measured at June 30, 2017

Dear Board Members:

This report contains accounting schedules prepared in connection with and required by GASB Statements No. 67 and No. 68. The information is presented in draft form for review by the Plan's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan's financial statements.

This report should not be relied on for any purpose other than compliance with GASB Statements No. 67 and No. 68. It is intended for use by the Retirement System and those designated or approved by the Board. It may be provided to other parties only in its entirety and only with the permission of the Board of Trustees. GRS is not responsible for unauthorized use of this report.

The report is based upon information furnished by the Executive Director and staff in connection with the December 31, 2016 valuation and certain supplemental information on financial activity during Fiscal 2017. Their efforts in furnishing this material are acknowledged with appreciation. We checked the information for internal and year-to-year consistency, but did not perform an audit. We are not responsible for the accuracy or completeness of such information.

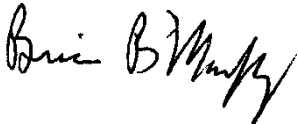
Since the measurement date for purposes of accounting (June 30, 2017) is not the same as the valuation date (December 31, 2016), we applied actuarial techniques to "Roll-Forward" the Total Pension Liability from December 31, 2016 to June 30, 2017. While we are not aware of any significant events that would affect the accuracy of the roll-forward techniques that we used, we caution users that an actuarial valuation performed as of June 30, 2017 would produce results somewhat different, and potentially materially different, from those shown herein. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 or No. 68 may produce significantly different results.

To the best of our knowledge, the information contained with this report is accurate and fairly represents the accounting position of the Educational Employees' Supplemental Retirement System of Fairfax County (ERFC) on the measurement date for purposes of GASB Statements No. 67 and No. 68. 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. Judith A. Kermans, Brian B. Murphy and Heidi G. Barry are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

This information is intended to assist in preparation of the financial statements of the ERFC. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

This communication shall not be construed to provide tax advice, legal advice, accounting advice, or investment advice.

Respectfully submitted,



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



Judith A. Kermans, EA, FCA, MAAA



Heidi G. Barry, ASA, FCA, MAAA

BBM/JAK/HGB:bd



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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of June 30, 2017

	2017
Actuarial Valuation Date	December 31, 2016
Measurement Date of the Net Pension Liability	June 30, 2017
Employer's Fiscal Year Ending Date (Reporting Date)	June 30, 2017
Membership	
Number of	
- Retirees and Beneficiaries	11,367
- Inactive, Nonretired Members	4,446
- Active Members	21,748
- Total	37,561
Covered Payroll	\$ 1,430,259,607
Net Pension Liability	
Total Pension Liability	\$ 3,094,309,317
Plan Fiduciary Net Position	2,304,281,654
Net Pension Liability	\$ 790,027,663
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	74.47%
Net Pension Liability as a Percentage of Covered Payroll	55.24%
Development of the Single Discount Rate	
Single Discount Rate	7.25%
Long-Term Expected Rate of Investment Return	7.25%
Long-Term Municipal Bond Rate*	3.56%
Last year ending June 30 in the 2018 to 2117 projection period for which projected benefit payments are fully funded	2117
Total Pension Expense	\$ 113,393,168

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	\$ 16,866,104	\$ 24,149,434
Changes in assumptions	51,706,409	-
Net difference between projected and actual earnings on pension plan investments	158,734,394	112,119,898
Total	\$ 227,306,907	\$ 136,269,332

* Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2017. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.

Discussion

Accounting Standard

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

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

Financial Statements

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

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to ERFC subsequent to the measurement date of June 30, 2017.

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

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

Notes to Financial Statements

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

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

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

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

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets;
- annual money-weighted rate of return; and
- if the plan has a Deferred Retirement Option ("DROP") a description of the terms of the plan's Deferred Retirement Option Program (DROP) and the total DROP balance for those members currently participating in the DROP.

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
- a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

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

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.25% on the actuarial value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to decrease as a percentage of payroll as new ERFC 2001 Tier 2 participants are hired.
2. The unfunded liability is expected to be paid off on June 30, 2040, which is the completion date of the unfunded liability amortization schedule.
3. The funded status of the plan is expected to reach a 100% funded ratio on June 30, 2040.

This funding policy results in the expectation that the plan's assets will be able to fully pay for promised benefits through at least 2117. The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

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 December 31, 2016 and a measurement date of June 30, 2017.

Single Discount Rate

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.25%; the municipal bond rate is 3.56% (based on the weekly rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 7.25%.

SECTION B

FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Educational Employees' Supplemental Retirement System of Fairfax County (ERFC). Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Pension Expense Under GASB Statement No. 68

Fiscal Year Ended June 30, 2017

A. Expense

1. Service Cost	\$ 78,925,763
2. Interest Cost	209,515,636
3. Current-Period Benefit Changes	(1,038,793)
4. Employee Contributions (made negative for addition here)	(43,062,632)
5. Projected Earnings on Plan Investments (made negative for addition here)	(150,832,175)
6. Pension Plan Administrative Expense	4,059,408
7. Other Changes in Plan Fiduciary Net Position	-
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	6,202,141
9. Recognition of Outflow (Inflow) of Resources due to Assets	9,623,820
10. Total Pension Expense	\$ 113,393,168

Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended June 30, 2017

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ 19,857,344
2. Assumption Changes (gains) or losses	\$ 23,334,195
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	6.6385
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability: (1)/(3)	\$ 2,991,240
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes: (2)/(3)	\$ 3,514,980
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities: 4. + 5.	\$ 6,506,220
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: 1. - 4.	\$ 16,866,104
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes: (2)-(5)	\$ 19,819,215
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities: 7. + 8.	\$ 36,685,319

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (100,149,602)
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	\$ (20,029,920)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets: 1. - 3.	\$ (80,119,682)

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended June 30

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

	<u>Outflows of Resources</u>	<u>Inflows of Resources</u>	<u>Net Outflows of Resources</u>
1. Due to Liabilities	\$ 13,438,671	\$ 7,236,530	\$ 6,202,141
2. Due to Assets	61,653,957	52,030,137	9,623,820
3. Total	\$ 75,092,628	\$ 59,266,667	\$ 15,825,961

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

	<u>Outflows of Resources</u>	<u>Inflows of Resources</u>	<u>Net Outflows of Resources</u>
1. Differences between expected and actual experience	\$ 2,991,240	\$ 7,236,530	\$ (4,245,290)
2. Assumption Changes	10,447,431	-	10,447,431
3. Net Difference between projected and actual earnings on pension plan investments	61,653,957	52,030,137	9,623,820
4. Total	\$ 75,092,628	\$ 59,266,667	\$ 15,825,961

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

	<u>Deferred Outflows of Resources</u>	<u>Deferred Inflows of Resources</u>	<u>Net Deferred Outflows of Resources</u>
1. Differences between expected and actual experience	\$ 16,866,104	\$ 24,149,434	\$ (7,283,330)
2. Assumption Changes	51,706,409	-	51,706,409
3. Net Difference between projected and actual earnings on pension plan investments	158,734,394	112,119,898	46,614,496
4. Total	\$ 227,306,907	\$ 136,269,332	\$ 91,037,575

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

<u>Year Ending June 30</u>	<u>Net Deferred Outflows of Resources</u>
2018	\$ 15,825,961
2019	\$ 47,826,177
2020	\$ 23,016,662
2021	\$ (9,448,431)
2022	\$ 9,662,985
Thereafter	\$ 4,154,221
Total	\$ 91,037,575

Numbers on this page may not match due to rounding.

Statement of Fiduciary Net Position as of June 30, 2017

	2017
Assets	
Cash and Deposits	\$ 206,189,936
Receivables	
Accounts Receivable - Sale of Investments	\$ 6,731,606
Accrued Interest and Other Dividends	2,963,524
Contributions	-
Accounts Receivable - Other	-
Total Receivables	\$ 9,695,130
Investments	
U.S. Government Obligations	\$ 18,415,390
Bonds and Mortgage Securities	107,303,732
Stocks	681,120,596
Real Estate	180,237,145
Global Asset Allocation	236,687,821
Better Beta	112,371,447
Hedge Fund of Funds	90,512,487
Private Equity	68,818,151
Commingled Fixed Income Funds	493,892,323
Commingled Equity Funds	280,770,081
Total Investments	\$ 2,270,129,173
Other	53,546
Total Assets	\$ 2,486,067,785
Liabilities	
Payables	
Accounts Payable and Securities Purchased	\$ 11,072,326
Accrued Expenses	-
Securities Lending Collateral	170,713,805
Total Liabilities	\$ 181,786,131
Net Position Restricted for Pensions	\$ 2,304,281,654

Statement of Changes in Fiduciary Net Position For Year Ended June 30, 2017

	2017
Additions	
Contributions	
Employer	\$ 80,094,538
Employee	43,062,632
Other	-
Total Contributions	\$ 123,157,170
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 223,619,057
Interest and dividends	33,416,321
Real estate income	6,580,592
Income from securities lending activities	863,823
Other	-
Less Investment Expense	(13,498,016)
Net Investment Income	\$ 250,981,777
Other	\$ -
Total Additions	\$ 374,138,947
 Deductions	
Benefit payments, including refunds of employee contributions	\$ 173,385,583
Pension Plan Administrative Expense	4,059,408
Other	-
Total Deductions	\$ 177,444,991
Net Increase in Net Position	\$ 196,693,956
 Net Position Restricted for Pensions	
Beginning of Year	\$ 2,107,587,698
End of Year	\$ 2,304,281,654

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Educational Employees' Supplemental Retirement System of Fairfax County (ERFC). Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Schedule of Roll-Forward of Total Pension Liability From December 31, 2016 to June 30, 2017

A. Prior December 31 Accrued Liability	\$ 3,032,503,491
B. Normal Cost \$	\$ 80,739,800
C. Expected Benefit Payments	\$ 171,535,245
D. Assumed Interest Rate	7.25%
Total Pension Liability June 30, 2017	
(A x(1+ D)^0.5) + (B-C) x(1+D)^0.25/2	\$ 3,094,309,317

The actuarial (funding) valuation is performed each year as of December 31. If that were the measurement date, the accrued liability as of December 31 would be the Total Pension Liability. Instead, the accrued liability from the funding valuation must be rolled-forward 6 months to the measurement date (June 30). The normal cost and expected benefit payments shown above are for the calendar year beginning on the most recent actuarial valuation date. They are necessary components of the roll-forward calculation, and are different from the service cost and actual benefit payments for the fiscal year, which are shown elsewhere in this report.

Schedule of Changes in Net Pension Liability and Related Ratios Current Reporting Period

Fiscal Year Ended June 30, 2017

A. Total Pension Liability	
1. Service Cost	\$ 78,925,763
2. Interest Cost	209,515,636
3. Changes of benefit terms	(1,038,793)
4. Difference between expected and actual experience of the Total Pension Liability	19,857,344
5. Changes of assumptions	23,334,195
6. Benefit payments, including refunds of employee contributions	(173,385,583)
7. Net change in Total Pension Liability	\$ 157,208,562
8. Total Pension Liability – Beginning	2,937,100,755
9. Total Pension Liability – Ending	<u><u>\$ 3,094,309,317</u></u>
B. Plan Fiduciary Net Position	
1. Contributions – Employer	\$ 80,094,538
2. Contributions – Employee	43,062,632
3. Net investment income	250,981,777
4. Benefit payments, including refunds of employee contributions	(173,385,583)
5. Pension Plan Administrative Expense	(4,059,408)
6. Other	-
7. Net change in Plan Fiduciary Net Position	\$ 196,693,956
8. Plan Fiduciary Net Position – Beginning	2,107,587,698
9. Plan Fiduciary Net Position – Ending	<u><u>\$ 2,304,281,654</u></u>
C. Net Pension Liability	<u><u>\$ 790,027,663</u></u>
D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability	74.47%
E. Covered-Employee payroll	\$ 1,430,259,607
F. Net Pension Liability as a percentage of Covered-Employee payroll	55.24%

Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Fiscal year ending June 30,	2017	2016	2015	2014
Total Pension Liability				
Service Cost	\$ 78,925,763	\$ 77,760,915	\$ 77,493,999	\$ 75,787,752
Interest Cost	209,515,636	205,720,047	198,938,575	192,723,577
Benefit Changes	(1,038,793)	-	-	-
Difference between Expected and Actual Experience	19,857,344	(11,011,883)	(17,051,192)	(19,051,630)
Assumption Changes	23,334,195	45,752,095	-	-
Benefit Payments	(168,783,718)	(165,721,790)	(162,145,265)	(161,276,831)
Refunds	(4,601,865)	(4,626,057)	(5,697,311)	(5,772,959)
Net Change in Total Pension Liability	157,208,562	147,873,327	91,538,806	82,409,909
Total Pension Liability - Beginning	2,937,100,755	2,789,227,428	2,697,688,622	2,615,278,713
Total Pension Liability - Ending (a)	<u>\$ 3,094,309,317</u>	<u>\$ 2,937,100,755</u>	<u>\$ 2,789,227,428</u>	<u>\$ 2,697,688,622</u>
Plan Fiduciary Net Position				
Employer Contributions	\$ 80,094,538	\$ 76,599,695	\$ 74,324,396	\$ 74,174,082
Employee Contributions	43,062,632	41,383,642	39,982,963	40,018,590
Pension Plan Net Investment Income	250,981,777	(15,766,967)	32,083,908	304,640,803
Benefit Payments	(168,783,718)	(165,721,790)	(162,145,265)	(161,276,831)
Refunds	(4,601,865)	(4,626,057)	(5,697,311)	(5,772,959)
Pension Plan Administrative Expense	(4,059,408)	(4,004,882)	(3,751,825)	(3,629,320)
Net Change in Plan Fiduciary Net Position	196,693,956	(72,136,359)	(25,203,134)	248,154,365
Plan Fiduciary Net Position - Beginning	2,107,587,698	2,179,724,057	2,204,927,191	1,956,772,826
Plan Fiduciary Net Position - Ending (b)	<u>\$ 2,304,281,654</u>	<u>\$ 2,107,587,698</u>	<u>\$ 2,179,724,057</u>	<u>\$ 2,204,927,191</u>
Net Pension Liability - Ending (a) - (b)	790,027,663	829,513,057	609,503,371	492,761,431
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	74.47 %	71.76 %	78.15 %	81.73 %
Covered-Employee Payroll	\$ 1,430,259,607	\$ 1,374,735,094	\$ 1,366,029,848	\$ 1,324,537,175
Net Pension Liability as a Percentage of Covered-Employee Payroll	55.24 %	60.34 %	44.62 %	37.20 %
Notes to Schedule:				
None				

Schedules of Required Supplementary Information

Schedule of the Net Pension Liability Multiyear

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
2014	\$ 2,697,688,622	\$ 2,204,927,191	\$ 492,761,431	81.73%	\$ 1,324,537,175	37.20%
2015	2,789,227,428	2,179,724,057	609,503,371	78.15%	1,366,029,848	44.62%
2016	2,937,100,755	2,107,587,698	829,513,057	71.76%	1,374,735,094	60.34%
2017	3,094,309,317	2,304,281,654	790,027,663	74.47%	1,430,259,607	55.24%

Schedule of Contributions Multiyear

Last 10 Fiscal Years

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2008	\$38,334,140	\$38,334,140	\$ -	\$1,137,511,573	3.37%
2009	37,281,658	40,012,480	(2,730,822)	1,187,313,947	3.37%
2010	35,146,816	37,868,623	(2,721,807)	1,183,394,469	3.20%
2011	47,118,111	47,118,111	-	1,166,289,876	4.04%
2012	50,738,815	52,934,245	(2,195,430)	1,219,683,057	4.34%
2013	68,242,010	67,734,634	507,376	1,268,438,838	5.34%
2014	72,748,999	74,174,082	(1,425,083)	1,324,537,175	5.60%
2015	74,791,177	74,324,396	466,781	1,366,029,848	5.44%
2016	76,069,503	76,599,695	(530,192)	1,374,735,094	5.57%
2017	80,305,269	80,094,538	210,731	1,430,259,607	5.60%

Covered payroll in 2016 and later is reported in accordance with GASB 82. The ratio in the last column cannot always be compared to contributions required by the ERFC Board's funding policy.

Notes to Schedule of Contributions

Valuation Date: December 31, 2013 and 2014
Notes

Actuarial valuations performed as of odd numbered years typically determine the contribution rate for the two year period beginning 18 months after the valuation date. The December 31, 2013 valuation was used to determine the funding policy contribution rates for Fiscal 2016 and 2017. Each actuarial valuation determines an ADEC for the period beginning 18 months after the valuation date. The December 31, 2014 valuation determined the ADEC for Fiscal 2017.

Methods and Assumptions Used to Determine FY 2017 Actuarially Determined Employer Contribution Rates:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	24 years from July 1, 2016
Asset Valuation Method	5-Year smoothed market; 25% corridor
Inflation	3% -- approximate; No explicit price inflation assumption is used in this valuation.
Salary Increases	3.75% to 9.05% including inflation
Investment Rate of Return	7.5%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2010 valuation pursuant to an experience study of the period 2005-09.
Mortality	1994 Group Annuity Mortality table set back 3 years for both males and females. This table appeared to have an approximate 7% margin for future improvement at the time of adoption.

Other Information:

Notes
There were no benefit changes during the year. An experience study was performed after the FY 2017 contribution rates were determined. The assumptions adopted in connection with that study will determine contribution rates beginning in FY 2018.

Schedule of Investment Returns Multiyear

FY Ending June 30,	Annual Return¹
2014	15.91 %
2015	1.49 %
2016	(0.63)%
2017	12.14 %

¹ Annual money-weighted rate of return, net of investment expenses as supplied by ERFC Staff.

SECTION D

NOTES TO FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Educational Employees' Supplemental Retirement System of Fairfax County (ERFC). Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Long–Term Expected Return on Assets

The long-term expected rate of return on plan assets is 7.25%. It was developed in conjunction with a study of experience covering the period January 1, 2010 through December 31, 2014 and dated November 10, 2015.

Estimates of arithmetic real rates of return as of the measurement date are summarized in the following table.

Asset Class	Policy Allocation	NEPC
		30-Year Assumptions Arithmetic Real Return
US Equity		
US Large Cap Equity	14.00%	5.92%
US Small/Mid Cap Equity	6.00%	6.71%
Non-US Equity		
International Equity (Unhedged)	14.00%	6.71%
Emerging International Equity	3.00%	9.70%
Fixed Income		
EMD (Local Currency)	3.00%	4.62%
Core Bonds	4.00%	1.38%
Diversified Fixed Income	16.00%	2.83%
Absolute Return Fixed Income	6.00%	1.79%
Real Estate		
Real Estate (Core)	4.00%	4.62%
REITs	3.50%	5.75%
Private Markets		
Private Equity	3.50%	8.73%
Hedge Funds		
Hedge Funds	8.00%	3.95%
GAA		
Pimco All Asset	5.00%	4.45%
Wellington Opportunistic Investment	5.00%	5.38%
Risk Parity		
BridgeWater All Weather	5.00%	4.47%
Total	100.00%	

New England Pension Consultants (NEPC) supplied the information in the above table. It is included here for convenience. Gabriel, Roeder, Smith & Company does not provide investment advice. We are not registered municipal advisors with the SEC. We did not develop the figures in the table.

Single Discount Rate

A Single Discount Rate of 7.25% 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 7.25%. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. 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 7.25%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

	Current Single Discount		
	1% Decrease 6.25%	Rate Assumption 7.25%	1% Increase 8.25%
TPL	\$3,488,740,546	\$3,094,309,317	\$2,771,054,985
PNP	2,304,281,654	2,304,281,654	2,304,281,654
NPL	\$1,184,458,892	\$ 790,027,663	\$ 466,773,331

Users of this report should be aware that in the Actuary's judgment, a discount rate of 8.25% would not be a reasonable assumption for funding purposes.

Disclosure Regarding the Deferred Retirement Option Program

This plan does not include a Deferred Retirement Option Program (“DROP”).

Summary of Population Statistics December 31, 2016

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	11,367
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	4,446
Active Plan Members	<u>21,748</u>
Total Plan Members	37,561

SECTION E

SUMMARY OF BENEFITS

Summary of Provisions as of December 31, 2016

Members Hired After July 1, 1988 but Before July 1, 2001

ERFC

1. **Service Retirement Eligibility.** A member may retire any time after reaching the service retirement date, which is either (i) age 65 with 5 years of service or (ii) age 55 with 25 years of service.
2. **Reduced Service Retirement Eligibility.** A member with 25 years of service but younger than age 55 may retire after age 45. A member with less than 25 years of service and younger than age 65 may retire after age 55.
3. **Deferred Retirement Eligibility.** An inactive member with 5 or more years of service will be entitled to a pension with payments beginning at age 55, provided she/he does not withdraw accumulated member contributions.
4. **Death-in-Service Benefit Eligibility.** An active member with 5 or more years of service who dies will have benefits payable to the surviving spouse or other eligible beneficiary. The 5-year service requirement is waived if the death is service-connected.
5. **Disability Retirement Eligibility.** An active member with 5 or more years of service who becomes totally and permanently disabled may be retired and receive a disability pension. The 5-year service requirement is waived if the disability is service-connected.
6. **Final Average Compensation (FAC).** A member's final average compensation is the average of the 3 highest consecutive years of salary during eligible employment.
7. **Service Retirement Amount.** For payment periods during the retired member's lifetime 103% times (i) minus (ii) where:
 - (i) means 1.85 percent of the FAC multiplied by years of credited service, and
 - (ii) means 1.65 percent of the portion of VRS FAC in excess of \$1,200, multiplied by applicable years of creditable Virginia service; provided if the member is younger than age 65 and if creditable Virginia service is less than 30 years, the result of such multiplication shall be reduced for each month before the earlier of:
 - (1) attainment of age 65; and
 - (2) the date when 30 years of service would have been completed.

The reduction shall be one-half of 1% for each of the first 60 months and four-tenths of one percent for each month beyond 60 months, if any.

For payment periods, if any, before the age the member becomes eligible for full Social Security benefits, an additional temporary benefit equal to 1.00 percent of the FAC multiplied by years of credited service.

Summary of Provisions as of December 31, 2016 Members Hired After July 1, 1988 but Before July 1, 2001 ERFC

8. **Reduced Service Retirement Amount after 25 Years of Service.** Service Retirement amount reduced to reflect retirement age younger than age 55.
9. **Reduced Service Retirement Amount after 5-24 Years of Service.** For payment periods during the retired member's lifetime, the Service Retirement amount payable at age 65 reduced to reflect retirement age younger than age 65. For payment periods before the age the member becomes eligible for full Social Security benefits, an additional temporary benefit equal to the Service Retirement temporary benefit reduced to reflect retirement age younger than age 65.
10. **Deferred Retirement Amount.** Calculated in the same manner as reduced service retirement.
11. **Death-in-Service Benefit Amount.** If the member is eligible for a service or reduced service retirement then an eligible named beneficiary will receive such benefits reduced based upon an Option A (in the case of a spouse or an ex-spouse subject to a DRO) or Option B (in case of another eligible beneficiary) election. If not, the eligible named beneficiary will receive an amount equal to 103% times a lifetime pension equal of 0.25% of the FAC multiplied by years of credited service, and also reduced in connection with an Option A or Option B election. Credited service shall be increased by the time period from the date of death to the date when the member would have reached service retirement with a minimum of 10 years of service used, provided the death was service-connected. If a named beneficiary is not eligible for either of these types of benefits, the named beneficiary will receive a refund of the member's accumulated contributions.
12. **Disability Retirement Amount.** The amount is 103% times a lifetime pension equal to 0.25 percent of the FAC multiplied by years of credited service. Credited service shall be increased by the time period from disability retirement to the date when the member would have reached the service retirement date. The minimum pension payable is 2.5 percent of FAC.
13. **Post-Retirement Increases.** The amount of the monthly benefit is adjusted each March 31st, by 3% compounded annually, beginning with the March 31st which is more than three full months after the member's effective retirement date. Pensions of members that retire in the immediately preceding calendar year are increased by 1.489% (one-half a year's increase).
14. **Member Contributions.** Effective July 1, 2012, members contribute 3% of their salaries. Interest credits are 5% annually through June 30, 2017, and 4% annually thereafter. If a member leaves covered employment before becoming eligible to retire, accumulated contributions are returned upon request. Members who receive a refund of contributions and are later rehired become members of ERFC 2001 Tier 2.

Summary of Provisions as of December 31, 2016 Members Hired After July 1, 1988 but Before July 1, 2001 ERFC

15. **Lifetime Level Benefit (for Retirements after July 1, 2004).** Members are eligible for a Lifetime Level Benefit (LLB) that is calculated by determining the annuitized value of the greater of their accumulated contribution balance or the present value of the currently provided benefit.
16. **Optional Forms of Payment.**
- Option A: 100% Joint and Survivor benefit. Benefit is 85% of the straight life amount adjusted for the difference in age between the retiree and beneficiary. The maximum benefit is 94% of the straight life amount.
 - Option B: 50% Joint and Survivor benefit. Benefit is 91% of the straight life amount adjusted for the difference in age between the retiree and beneficiary. The maximum benefit is 97% of the straight life amount.
 - Option C: 10 years Certain and Life. Benefit is 96% of the straight life amount.
 - Option D: Single sum payment not exceeding member's accumulated contribution balance, plus a single life annuity actuarially reduced from the pension amount otherwise payable. Actuarial equivalent factors are described on page 42.

Summary of Provisions as of December 31, 2016

Alternate Benefits Available to Members with Some Service Before July 1, 1988

Service Retirement: Alternate Amount After Full Social Security Age. A member with service before 7/1/1988 may elect, at time of retirement, to receive an alternate benefit amount for payment periods after full Social Security age. The Alternative Guarantee amount is the amount that would have been received after the individual reached eligibility for full Social Security benefits under the Old Plan (pre – July 1, 1988) formulas. The amount is 103% of the total of:

- (i) the amount payable under June 30, 1987 benefit provisions,
- (ii) plus, if the retiring member is younger than full Social Security age and if creditable Virginia service is less than 30 years, 1.65 percent of VRS average final compensation in excess of \$1,200, multiplied by years of creditable Virginia service, and further multiplied by a certain percent based upon the number of months that retirement occurs before reaching the earlier of the above two conditions; such percent is one half of one percent for each of the first 60 such months and four-tenths of one percent for each of the next 60 such months, if any.

Reduced Service Retirement: Alternate Amount with 25 Years or more Years of Service. By election at time of retirement, such a member may elect to receive 103% of the following combination of benefits:

To age 55, 2.85 percent of the 3-year average annual salary multiplied by years of credited service, then actuarially reduced to reflect retirement age younger than age 55;

From age 55 to 65, the amount to age 55 reduced by: 1.65 percent of the portion of VRS average final compensation in excess of \$1,200, multiplied by applicable years of creditable Virginia service; provided if creditable Virginia service is less than 30 years, the result of such multiplication shall be actuarially reduced for each month before the earlier of (1) attainment of age 65; and (2) the date when 30 years' service would have been completed; and

From age 65 for life, the amount payable at age 65 according to June 30, 1987 provisions or the amount payable at age 65 according to July 1, 1988 provisions.

Summary of Provisions as of December 31, 2016

Members Hired On/After July 1, 2001 but Before July 1, 2017

ERFC 2001 Tier 1

1. **Service Retirement Eligibility.** A member may retire at age 60 with 5 or more years of credited service, or after 30 years of credited service regardless of age.
2. **Deferred Retirement Eligibility.** Any member with 5 or more years of credited service who terminates employment prior to the service retirement date, will be eligible to receive a deferred vested pension commencing at age 60, provided accumulated contributions are left on deposit with the Plan.
3. **Death Benefit Eligibility.** Any member with 5 or more years of credited service who dies before beginning to receive a pension will have benefits payable to the named beneficiary.
4. **Final Average Compensation (FAC).** A member's Final Average Compensation is the average of the 3 highest years of salary during eligible employment.
5. **Service Retirement Pension.** The amount is a lifetime pension equal to 0.8% (eight-tenths of one percent) of FAC at retirement multiplied by years of credited service. If necessary, the pension will be increased to make the reserve value of the pension equal to the member's accumulated contributions as of the retirement effective date.
6. **Deferred Retirement Pension.** The amount is a lifetime pension equal to 0.8% (eight-tenths of one percent) of FAC at termination multiplied by years of credited service. If necessary, the pension will be increased to make the reserve value of the pension equal to the member's accumulated contributions as of the effective retirement date.
7. **Survivor Death Benefit.** The amount is a lifetime pension equal to 0.8% (eight-tenths of one percent) of FAC multiplied by years of credited service at the date of death. If necessary, the pension will be increased to make the reserve value of the pension equal to the member's accumulated contributions as of the date of death. The pension will be adjusted in accordance with an Option A (in the case of a spouse or an ex-spouse subject to a DRO) or Option B (in case of another eligible beneficiary) election payable immediately unless the member did not reach the service retirement eligibility prior to death, in which case the pension is reduced for each month that the member was younger than age 60 on the date of death in the following manner:
 - a. One-half of 1% for each of the first 60 months and four-tenths of one percent for each month beyond 60 months (the number of months used for reduction is not to exceed the difference between the member's credited service at death and 30 years).

Summary of Provisions as of December 31, 2016

Members Hired On/After July 1, 2001 but Before July 1, 2017

ERFC 2001 Tier 1

8. **Cost-of-Living Adjustments.** The amount of the monthly benefit is adjusted each March 31st, by 3% compounded annually, beginning with the March 31st which is more than three full months after the member's effective retirement date. Pensions of members that retire in the immediately preceding calendar year are increased by 1.489% (one-half a year's increase).
9. **Members' Contributions.** Effective July 1, 2012, members contribute 3% of their salaries. Interest credits are 5% annually through June 30, 2017, and 4% annually thereafter. If a member leaves covered employment before becoming eligible to retire, accumulated contributions are returned upon request. Members who receive a refund of contributions and are later rehired become members of ERFC 2001 Tier 2.
10. **Optional Methods of Payment.** Before the effective retirement date, a retiring member may elect one of the following options:
 - Option A: 100% Joint and Survivor benefit. Benefit is 85% of the straight life amount adjusted for the difference in age between the retiree and beneficiary. The maximum benefit is 94% of the straight life amount.
 - Option B: 50% Joint and Survivor benefit. Benefit is 91% of the straight life amount adjusted for the difference in age between the retiree and beneficiary. The maximum benefit is 97% of the straight life amount.
 - Option C: 10 years Certain and Life. Benefit is 96% of the straight life amount.

Summary of Provisions as of December 31, 2016

Members Hired On/After July 1, 2017

ERFC 2001 Tier 2

1. **Service Retirement Eligibility.** A member may retire at Full Social Security Age (FSSA) with 5 or more years of credited service, or when the sum of age plus service is greater than or equal to 90 (i.e., “Rule of 90”).
2. **Deferred Retirement Eligibility.** Any member with 5 or more years of credited service who terminates employment prior to the service retirement date, will be eligible to receive a deferred vested pension commencing at FSSA, provided accumulated contributions are left on deposit with the Plan.
3. **Death Benefit Eligibility.** Any member with 5 or more years of credited service who dies before beginning to receive a pension will have benefits payable to the named beneficiary.
4. **Final Average Compensation (FAC).** A member’s Final Average Compensation is the average of the 5 highest years of salary during eligible employment.
5. **Service Retirement Pension.** The amount is a lifetime pension equal to 0.8% (eight-tenths of one percent) of FAC at retirement multiplied by years of credited service. If necessary, the pension will be increased to make the reserve value of the pension equal to the member’s accumulated contributions as of the retirement effective date.
6. **Deferred Retirement Pension.** The amount is a lifetime pension equal to 0.8% (eight-tenths of one percent) of FAC at termination multiplied by years of credited service. If necessary, the pension will be increased to make the reserve value of the pension equal to the member’s accumulated contributions as of the effective retirement date.
7. **Survivor Death Benefit.** The amount is a lifetime pension equal to 0.8% (eight-tenths of one percent) of FAC multiplied by years of credited service at the date of death. If necessary, the pension will be increased to make the reserve value of the pension equal to the member’s accumulated contributions as of the date of death. The pension will be adjusted in accordance with an Option A (in the case of a spouse or an ex-spouse subject to a DRO) or Option B (in case of another eligible beneficiary) election payable immediately unless the member did not reach the service retirement eligibility prior to death, in which case the pension is reduced for each month that the member was younger than service retirement eligibility on the date of death in the following manner:
 - a. One-half of 1% for each of the first 60 months and four-tenths of one percent for each month beyond 60 months (the number of months used for reduction is based on the lesser of FSSA or the age the member would have attained “Rule of 90”).

Summary of Provisions as of December 31, 2016 Members Hired On/After July 1, 2017 ERFC 2001 Tier 2

8. **Cost-of-Living Adjustments.** The amount of the monthly benefit is adjusted each March 31st, by 100% of the Consumer Price Index (CPI-U) (with a cap of 4%) compounded annually, beginning with the March 31st which is more than three full months after the member's effective retirement date. Pensions of members that retire in the immediately preceding calendar year are increased by one-half a year's increase.
9. **Members' Contributions.** Members contribute 3% of their salaries. Interest credits are 4% annually. If a member leaves covered employment before becoming eligible to retire, accumulated contributions are returned upon request.
10. **Optional Methods of Payment.** Before the effective retirement date, a retiring member may elect one of the following options:
 - Option A: 100% Joint and Survivor benefit. Benefit is 85% of the straight life amount adjusted for the difference in age between the retiree and beneficiary. The maximum benefit is 94% of the straight life amount.
 - Option B: 50% Joint and Survivor benefit. Benefit is 91% of the straight life amount adjusted for the difference in age between the retiree and beneficiary. The maximum benefit is 97% of the straight life amount.
 - Option C: 10 years Certain and Life. Benefit is 96% of the straight life amount.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Summary of Assumptions Used for Total Pension Liability and Service Cost Determinations

The actuarial assumptions used in the accounting valuation are shown in this section of the report. Except as otherwise noted, the rationale for the assumptions for the December 31, 2016 accounting valuation is based upon a study of experience during the period January 1, 2010 to December 31, 2014.

Economic Assumptions

The investment return rate used in the valuation was 7.25% per year, compounded annually (net of investment expenses). The real rate of return over wages or the “spread” is defined to be the portion of total investment return which is more than the wage inflation rate. Based upon an assumed wage inflation rate of 3.25%, the 7.25% investment return rate translates to an assumed real rate of return over wages of 4.00%. The assumed real return over prices would be higher.

Pay increase assumptions for individual active members are shown by years of service on page 41. Part of the pay increase assumption is for merit and/or seniority increase, and the other 3.25% recognizes price inflation and real wage growth.

Price Inflation: No explicit price inflation assumption is needed for this valuation. However, the above assumptions would be consistent with a price inflation assumption around 2.75%.

The number of active members is assumed to continue at the present number.

Total active member payroll is assumed to increase 3.25% annually in the long term, which is the portion of the individual pay increase assumptions attributable to wage inflation. This assumed increase is recognized in the funding of unfunded actuarial accrued liabilities.

Non-Economic Assumptions

The mortality table used to measure retired life mortality was 90% of the male rates and 79% of the female rates of the RP-2014 mortality Total Data Set Healthy Annuitant Mortality tables, adjusted for mortality improvement back to the base year of 2006. Mortality rates for a particular calendar year are determined by applying the fully generational MP-2016 Mortality Improvement scale to the above-described tables. Tables were extended below age 50 with a cubic spline to the published Juvenile rates. Related values are shown on page 37. The corresponding Disabled and Employee tables were used for disability and pre-retirement mortality, respectively; related values are shown on page 39. These tables were first used in the December 31, 2016 valuation. The rationale for the mortality assumption is based on the 2010-2014 Experience Study issued November 10, 2015 and further analysis done in July 2017.

The probabilities of retirement for members eligible to retire are shown on page 38.

The probabilities of withdrawal from service, **death-in-service** and **disability** are shown for sample ages on pages 39 and 40.

The individual entry age actuarial cost method of valuation was used for determining total pension liabilities and service cost. The method determines separate service costs for *ERFC* and for *ERFC 2001* and adds them together to produce the service costs shown on page 7.

Present assets (cash and investments) are valued at market.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA).

Single Life Retirement Values

Mortality

Future Life Expectancy (Years)		
Sample Ages in 2016	Males	Females
55	30.67	34.35
60	26.07	29.50
65	21.69	24.82
70	17.54	20.34
75	13.67	16.13
80	10.21	12.32
Ref:	2135	2136

The corresponding Disabled and Employee tables were used for disability and pre-retirement mortality, respectively; related values are shown on page 39.

Probabilities of Retirement for Members Eligible to Retire

Ages	ERFC (Hired Before 7/1/2001)		ERFC 2001 Tier 1 (Hired 7/1/2001-6/30/2017)			ERFC 2001 Tier 2 (Hired On/After 7/1/2017)	
	Type of Retirement		Age Based	Service	Service Based	Age Based	
	Service	Reduced Service				Rule of 90 Met?	
			Yes	No			
45		2.0%					
46		2.0%					
47		2.0%					
48		2.0%					
49		2.0%					
50		2.0%					
51		3.0%					
52		6.0%					
53		7.0%					
54		8.0%					
55	35.0%	6.0%	17.5%	30	17.5%		
56	35.0%	4.0%	17.5%	31	17.5%	35.0%	0.0%
57	25.0%	4.0%	12.5%	32	12.5%	35.0%	0.0%
58	25.0%	4.0%	12.5%	33	12.5%	35.0%	0.0%
59	25.0%	4.0%	12.5%	34	12.5%	35.0%	0.0%
60	25.0%	7.0%	10.0%	35	10.0%	35.0% *	0.0%
61	30.0%	8.0%	10.0%	36	10.0%	35.0%	0.0%
62	30.0%	13.0%	10.0%	37	10.0%	35.0%	0.0%
63	30.0%	13.0%	10.0%	38	25.0%	35.0%	0.0%
64	30.0%	13.0%	20.0%	39	40.0%	35.0%	0.0%
65	30.0%		25.0%	40 & Up	100.0%	35.0%	0.0%
66	30.0%		30.0%			35.0%	0.0%
67	25.0%		25.0%			35.0%	30.0%
68	25.0%		15.0%			35.0%	15.0%
69	20.0%		15.0%			35.0%	15.0%
70	20.0%		15.0%			35.0%	15.0%
71	20.0%		15.0%			35.0%	15.0%
72	20.0%		15.0%			35.0%	15.0%
73	30.0%		15.0%			35.0%	15.0%
74	30.0%		15.0%			35.0%	15.0%
75 & Over	100.0%		100.0%			100.0%	100.0%
Ref:	2891	2893	2892		2894	999	999

* The probability is 60% at age 60 for people who first meet the Rule of 90 at age 60.

The age column index does not apply to the service based retirements. In ERFC 2001 Tier 1, an individual can retire at 30 years of service regardless of age. In ERFC 2001 Tier 2, an individual would be able to retire at FSSA with 5 years of service or when the sum of age and service is greater than or equal to 90. FSSA is assumed to be age 67 for members hired on/after July 1, 2017.

Sample Rates of Separation from Active Employment Before Retirement

Ages	% of Active Members Dying or Becoming Disabled within Next Year							
	Death*				Disability			
	Ordinary		Duty		Ordinary		Duty	
	Men	Women	Men	Women	Men	Women	Men	Women
25	0.0232%	0.0072%	0.0023%	0.0007%	0.0146%	0.0082%	0.0036%	0.0020%
30	0.0219%	0.0093%	0.0022%	0.0009%	0.0158%	0.0122%	0.0040%	0.0031%
35	0.0255%	0.0122%	0.0026%	0.0011%	0.0234%	0.0214%	0.0059%	0.0054%
40	0.0303%	0.0165%	0.0030%	0.0015%	0.0339%	0.0308%	0.0085%	0.0077%
45	0.0465%	0.0272%	0.0046%	0.0025%	0.0520%	0.0456%	0.0130%	0.0114%
50	0.0805%	0.0461%	0.0081%	0.0043%	0.0842%	0.0726%	0.0210%	0.0181%
55	0.1353%	0.0710%	0.0135%	0.0066%	0.1469%	0.1228%	0.0367%	0.0307%
60	0.2303%	0.1027%	0.0230%	0.0096%	0.2447%	0.1770%	0.0612%	0.0443%
Ref:	0.50 x 2133	0.43 x 2134	0.05 x 2133	0.04 x 2134				
	sb 0	sb 0	sb 0	sb 0	0.08 x 16	0.08 x 17	0.02 x 16	0.02 x 17

* Applicable to calendar year 2016 . Rates in future years are determined by the MP-2016 projection scale.

Sample Rates of Separation from Active Employment Before Retirement

Service	% of Active Participants Withdrawing	
	Males	Females
0 - 1	13%	15%
1 - 2	12%	14%
2 - 3	11%	13%
3 - 4	9%	11%
4 - 5	7%	9%
5 - 6	6%	9%
6 - 7	5%	9%
7 - 8	4%	9%
8 - 9	4%	6%
9 - 10	4%	5%
10 - 11	4%	5%
11 - 12	3%	4%
12 - 13	3%	4%
13 - 14	3%	3%
14 - 15	2%	3%
15 - 16	2%	3%
16 - 17	1%	3%
17 - 18	1%	2%
18 - 19	1%	2%
19 - 20	1%	2%
20 - 21	1%	2%
21 - 22	1%	2%
22 - 23	1%	2%
23 - 24	1%	2%
24 - 25	1%	2%
Ref:	1671	1672

In addition, forfeiture occurs when a vested person separates from service and withdraws contributions thereby forfeiting future rights to an employer financed benefit. The total probability of forfeiture is obtained by multiplying the probability of withdrawal above by 10%. Forfeiture rates do not apply to individuals who are eligible for retirement at time of termination.

Sample Pay Increase Assumptions for an Individual Member

Pay Increase Assumption			
Service Index	Merit & Seniority	Base (Economy)	Increase Next Year
1	5.80%	3.25%	9.05%
2	4.00%	3.25%	7.25%
3	3.30%	3.25%	6.55%
4	3.10%	3.25%	6.35%
5	2.50%	3.25%	5.75%
6	2.40%	3.25%	5.65%
7	2.30%	3.25%	5.55%
8	1.70%	3.25%	4.95%
9	1.60%	3.25%	4.85%
10	1.40%	3.25%	4.65%
11	1.40%	3.25%	4.65%
12	1.40%	3.25%	4.65%
13	1.40%	3.25%	4.65%
14	1.40%	3.25%	4.65%
15	0.90%	3.25%	4.15%
16	0.80%	3.25%	4.05%
17	0.70%	3.25%	3.95%
18	0.50%	3.25%	3.75%
19	0.50%	3.25%	3.75%
20	0.40%	3.25%	3.65%
21	0.30%	3.25%	3.55%
22	0.20%	3.25%	3.45%
23	0.20%	3.25%	3.45%
24	0.20%	3.25%	3.45%
25	0.00%	3.25%	3.25%
Ref:	739	3.25%	

These rates were first used in the December 31, 2016 valuation. The rationale for the salary assumption is based on the 2010-2014 Experience Study issued November 10, 2015 and further analysis in July 2017.

Miscellaneous and Technical Assumptions

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	Nine months after the valuation date (October 1 st).
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
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.
COLA Assumption:	Members hired prior to July 1, 2017: 3% (actual COLA). Members hired on/after July 1, 2017: 2.59% (long-term estimate of provision of 100% of CPI-U capped at 4%; see GRS letter dated November 22, 2016).
Benefit Commencement for Terminated Vested Members:	At plan commencement age provided in terminated vested member data.
Adjustments:	For members hired prior to July 1, 2001 computed liabilities and service costs are increased by 3.25% to reflect service credit for unused sick leave that may be granted at retirement. Computed liabilities and service costs for Normal and Early retirement are reduced by 1% to reflect a “negative subsidy” in the Plan Document option factors. To account for administrative expenses, 0.27% of pay was added to the otherwise computed service cost. This amount will be adjusted each year based on actual administrative expenses during the year and pay as of the valuation date.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability, mortality and turnover do not operate during retirement eligibility.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
Normal Form of Benefit:	The assumed normal form of benefit is the straight life form.
Benefit Service:	Exact Fractional Service is used to determine the amount of benefit payable.
Actuarial Equivalent Factors (as of the date of this report):	The interest rate is 7.25% for the Option D form of payment. For Small Pension payouts the interest rate is the lesser of 7.25% or the rate for 20-year Treasury Notes raised to the next highest integer from the December 1 st preceding the Calendar year of retirement. Mortality is based upon a 20% unisex blend of the RP-2014 Total Data Set Healthy Annuitant Mortality Table.

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 valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.25%; the municipal bond rate is 3.56%; and the resulting SDR is 7.25%.

The tables in this section provide background for the development of the SDR.

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 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

Fiscal Year	Payroll for Current Employees	Contributions from Current Employees	Service Cost and Expense Contributions	UAL Contributions	Total Contributions
2017	\$1,430,259,607				
2018	1,361,430,510	\$ 40,842,915	\$ 41,955,505	\$ 47,881,725	\$ 130,680,144
2019	1,305,595,259	39,167,858	40,197,105	52,289,397	131,654,360
2020	1,256,424,630	37,692,739	38,588,376	55,084,563	131,365,678
2021	1,211,048,087	36,331,443	37,143,798	59,518,747	132,993,987
2022	1,169,459,605	35,083,788	35,745,982	63,310,944	134,140,713
2023	1,128,997,047	33,869,911	34,367,321	64,010,757	132,247,989
2024	1,089,220,740	32,676,622	32,956,472	64,260,063	129,893,158
2025	1,048,808,697	31,464,261	31,501,744	66,237,070	129,203,074
2026	1,009,514,272	30,285,428	29,987,464	68,239,192	128,512,084
2027	971,003,182	29,130,095	28,531,626	70,308,419	127,970,140
2028	935,231,394	28,056,942	27,155,830	72,487,230	127,700,001
2029	901,815,950	27,054,479	25,874,353	74,763,184	127,692,015
2030	870,714,417	26,121,433	24,664,062	77,109,701	127,895,195
2031	839,437,744	25,183,132	23,525,891	79,527,375	128,236,398
2032	808,567,585	24,257,028	22,358,530	82,015,491	128,631,049
2033	776,632,796	23,298,984	21,200,574	84,572,359	129,071,917
2034	743,814,593	22,314,438	20,077,982	87,195,758	129,588,178
2035	710,608,644	21,318,259	18,958,440	89,882,068	130,158,767
2036	676,752,001	20,302,560	17,840,490	92,624,211	130,767,261
2037	642,440,989	19,273,230	16,739,422	95,408,189	131,420,841
2038	608,360,710	18,250,821	15,666,817	98,203,875	132,121,514
2039	574,308,223	17,229,247	14,647,830	100,933,109	132,810,186
2040	539,608,392	16,188,252	13,662,894	103,280,038	133,131,184
2041	501,893,649	15,056,809	12,655,806	-	27,712,615
2042	462,334,594	13,870,038	11,515,501	-	25,385,538
2043	418,756,006	12,562,680	10,363,023	-	22,925,704
2044	374,430,063	11,232,902	9,188,403	-	20,421,305
2045	328,881,996	9,866,460	8,036,294	-	17,902,754
2046	283,521,981	8,505,659	6,882,350	-	15,388,009
2047	241,631,010	7,248,930	5,741,448	-	12,990,378
2048	203,208,834	6,096,265	4,801,503	-	10,897,768
2049	170,072,028	5,102,161	4,040,386	-	9,142,547
2050	140,820,957	4,224,629	3,357,659	-	7,582,287
2051	113,869,013	3,416,070	2,696,306	-	6,112,377
2052	89,045,322	2,671,360	2,074,403	-	4,745,762
2053	66,255,571	1,987,667	1,541,459	-	3,529,126
2054	46,652,090	1,399,563	1,070,881	-	2,470,443
2055	29,516,760	885,503	671,017	-	1,556,519
2056	16,377,653	491,330	323,871	-	815,201
2057	8,340,865	250,226	95,612	-	345,838
2058	2,927,526	87,826	66,154	-	153,980
2059	1,793,291	53,799	36,232	-	90,031
2060	919,075	27,572	18,248	-	45,820
2061	403,002	12,090	5,924	-	18,014
2062	138,149	4,144	(335)	-	3,810
2063	-	-	-	-	-
2064	-	-	-	-	-
2065	-	-	-	-	-
2066	-	-	-	-	-
2067	-	-	-	-	-

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

Single Discount Rate Development

Projection of Plan Fiduciary Net Position Ending June 30, 2117

Fiscal Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.25%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2018	\$ 2,304,281,654	\$ 130,680,144	\$ 174,666,304	\$ 3,675,862	\$ 165,362,901	\$ 2,421,982,533
2019	2,421,982,533	131,654,360	180,268,747	3,525,107	173,736,746	2,543,579,785
2020	2,543,579,785	131,365,678	185,563,727	3,392,347	182,358,409	2,668,347,798
2021	2,668,347,798	132,993,987	190,711,086	3,269,830	191,283,120	2,798,643,989
2022	2,798,643,989	134,140,713	197,180,556	3,157,541	200,544,019	2,932,990,624
2023	2,932,990,624	132,247,989	205,144,035	3,048,292	209,937,005	3,066,983,292
2024	3,066,983,292	129,893,158	214,625,254	2,940,896	219,233,749	3,198,544,049
2025	3,198,544,049	129,203,074	226,237,399	2,831,783	228,337,636	3,327,015,577
2026	3,327,015,577	128,512,084	238,241,791	2,725,689	237,203,445	3,451,763,626
2027	3,451,763,626	127,970,140	249,401,614	2,621,709	245,834,615	3,573,545,058
2028	3,573,545,058	127,700,001	259,596,151	2,525,125	254,294,501	3,693,418,284
2029	3,693,418,284	127,692,015	268,605,562	2,434,903	262,667,362	3,812,737,197
2030	3,812,737,197	127,895,195	276,668,535	2,350,929	271,041,041	3,932,653,969
2031	3,932,653,969	128,236,398	284,124,295	2,266,482	279,484,625	4,053,984,216
2032	4,053,984,216	128,631,049	291,381,332	2,183,132	288,039,627	4,177,090,428
2033	4,177,090,428	129,071,917	298,554,805	2,096,909	296,728,111	4,302,238,743
2034	4,302,238,743	129,588,178	305,173,116	2,008,299	305,587,191	4,430,232,696
2035	4,430,232,696	130,158,767	310,882,046	1,918,643	314,686,940	4,562,277,714
2036	4,562,277,714	130,767,261	315,530,180	1,827,230	324,119,585	4,699,807,151
2037	4,699,807,151	131,420,841	319,100,607	1,734,591	333,989,882	4,844,382,676
2038	4,844,382,676	132,121,514	322,153,405	1,642,574	344,391,112	4,997,099,323
2039	4,997,099,323	132,810,186	325,843,942	1,550,632	355,359,430	5,157,874,366
2040	5,157,874,366	133,131,184	330,874,448	1,456,943	366,851,225	5,325,525,384
2041	5,325,525,384	27,712,615	337,551,624	1,355,113	375,017,176	5,389,348,438
2042	5,389,348,438	25,385,538	345,865,043	1,248,303	379,269,182	5,446,889,813
2043	5,446,889,813	22,925,704	355,226,768	1,130,641	383,024,088	5,496,482,195
2044	5,496,482,195	20,421,305	365,387,239	1,010,961	386,172,729	5,536,678,029
2045	5,536,678,029	17,902,754	376,481,157	887,981	388,606,489	5,565,818,134
2046	5,565,818,134	15,388,009	388,825,802	765,509	390,194,280	5,581,809,112
2047	5,581,809,112	12,990,378	402,097,079	652,404	390,799,594	5,582,849,600
2048	5,582,849,600	10,897,768	414,562,589	548,664	390,360,226	5,568,996,342
2049	5,568,996,342	9,142,547	425,273,349	459,194	388,915,066	5,541,321,412
2050	5,541,321,412	7,582,287	434,850,457	380,217	386,514,781	5,500,187,805
2051	5,500,187,805	6,112,377	443,633,416	307,446	383,170,022	5,445,529,342
2052	5,445,529,342	4,745,762	451,314,859	240,422	378,887,417	5,377,607,240
2053	5,377,607,240	3,529,126	457,558,218	178,890	373,699,563	5,297,098,821
2054	5,297,098,821	2,470,443	462,308,806	125,961	367,657,686	5,204,792,183
2055	5,204,792,183	1,556,519	465,587,639	79,695	360,817,774	5,101,499,143
2056	5,101,499,143	815,201	467,347,296	44,220	353,241,218	4,988,164,045
2057	4,988,164,045	345,838	467,151,926	22,520	345,015,438	4,866,350,876
2058	4,866,350,876	153,980	464,921,498	7,904	336,257,109	4,737,832,562
2059	4,737,832,562	90,031	461,532,490	4,842	327,058,065	4,603,443,326
2060	4,603,443,326	45,820	457,504,846	2,482	317,456,802	4,463,438,621
2061	4,463,438,621	18,014	452,809,620	1,088	307,472,745	4,318,118,672
2062	4,318,118,672	3,810	447,408,440	373	297,128,935	4,167,842,604
2063	4,167,842,604	-	441,295,638	-	286,451,510	4,012,998,475
2064	4,012,998,475	-	434,524,114	-	275,466,483	3,853,940,844
2065	3,853,940,844	-	427,074,473	-	264,200,130	3,691,066,500
2066	3,691,066,500	-	418,884,863	-	252,683,419	3,524,865,056
2067	3,524,865,056	-	409,968,784	-	240,951,367	3,355,847,639

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

Single Discount Rate Development

Projection of Plan Fiduciary Net Position Ending June 30, 2117 (Concluded)

Fiscal Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.25%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2068	\$ 3,355,847,639	\$ -	\$ 400,308,087	\$ -	\$ 229,041,678	\$ 3,184,581,229
2069	3,184,581,229	-	389,853,244	-	216,997,220	3,011,725,205
2070	3,011,725,205	-	378,636,420	-	204,864,654	2,837,953,439
2071	2,837,953,439	-	366,658,445	-	192,692,806	2,663,987,799
2072	2,663,987,799	-	353,950,714	-	180,532,892	2,490,569,977
2073	2,490,569,977	-	340,556,699	-	168,437,138	2,318,450,417
2074	2,318,450,417	-	326,452,350	-	156,460,807	2,148,458,874
2075	2,148,458,874	-	311,726,551	-	144,660,891	1,981,393,214
2076	1,981,393,214	-	296,467,114	-	133,092,107	1,818,018,207
2077	1,818,018,207	-	280,704,153	-	121,808,829	1,659,122,882
2078	1,659,122,882	-	264,514,450	-	110,865,526	1,505,473,959
2079	1,505,473,959	-	247,986,678	-	100,314,628	1,357,801,909
2080	1,357,801,909	-	231,221,549	-	90,205,508	1,216,785,868
2081	1,216,785,868	-	214,331,741	-	80,583,388	1,083,037,515
2082	1,083,037,515	-	197,440,564	-	71,488,224	957,085,175
2083	957,085,175	-	180,678,492	-	62,953,674	839,360,357
2084	839,360,357	-	164,177,695	-	55,006,313	730,188,974
2085	730,188,974	-	148,067,289	-	47,665,172	629,786,858
2086	629,786,858	-	132,470,282	-	40,941,518	538,258,093
2087	538,258,093	-	117,501,635	-	34,838,802	455,595,261
2088	455,595,261	-	103,267,656	-	29,352,700	381,680,305
2089	381,680,305	-	89,864,298	-	24,471,237	316,287,244
2090	316,287,244	-	77,375,105	-	20,175,052	259,087,191
2091	259,087,191	-	65,869,637	-	16,437,824	209,655,379
2092	209,655,379	-	55,400,509	-	13,226,884	167,481,753
2093	167,481,753	-	45,999,880	-	10,504,106	131,985,979
2094	131,985,979	-	37,676,739	-	8,227,098	102,536,338
2095	102,536,338	-	30,416,421	-	6,350,581	78,470,497
2096	78,470,497	-	24,182,339	-	4,827,839	59,115,997
2097	59,115,997	-	18,918,186	-	3,612,124	43,809,936
2098	43,809,936	-	14,550,417	-	2,657,996	31,917,515
2099	31,917,515	-	10,992,740	-	1,922,505	22,847,280
2100	22,847,280	-	8,151,264	-	1,366,114	16,062,131
2101	16,062,131	-	5,928,463	-	953,358	11,087,026
2102	11,087,026	-	4,227,487	-	653,244	7,512,783
2103	7,512,783	-	2,955,252	-	439,423	4,996,955
2104	4,996,955	-	2,025,529	-	290,138	3,261,564
2105	3,261,564	-	1,362,037	-	187,953	2,087,480
2106	2,087,480	-	899,102	-	119,320	1,307,698
2107	1,307,698	-	582,428	-	74,065	799,335
2108	799,335	-	369,717	-	44,784	474,402
2109	474,402	-	229,178	-	26,232	271,456
2110	271,456	-	137,420	-	14,786	148,822
2111	148,822	-	78,854	-	7,981	77,949
2112	77,949	-	43,141	-	4,115	38,923
2113	38,923	-	22,127	-	2,034	18,831
2114	18,831	-	10,580	-	988	9,239
2115	9,239	-	5,349	-	479	4,369
2116	4,369	-	3,266	-	200	1,304
2117	1,304	-	1,303	-	48	48

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

Single Discount Rate Development

Present Values of Projected Benefits Ending June 30, 2117

Fiscal 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}
2018	\$ 2,304,281,654	\$ 174,666,304	\$ 174,666,304	\$ -	\$ 168,659,373	\$ -	\$ 168,659,373
2019	2,421,982,533	180,268,747	180,268,747	-	162,302,231	-	162,302,231
2020	2,543,579,785	185,563,727	185,563,727	-	155,775,744	-	155,775,744
2021	2,668,347,798	190,711,086	190,711,086	-	149,274,417	-	149,274,418
2022	2,798,643,989	197,180,556	197,180,556	-	143,905,116	-	143,905,116
2023	2,932,990,624	205,144,035	205,144,035	-	139,596,246	-	139,596,246
2024	3,066,983,292	214,625,254	214,625,254	-	136,175,308	-	136,175,308
2025	3,198,544,049	226,237,399	226,237,399	-	133,839,604	-	133,839,604
2026	3,327,015,577	238,241,791	238,241,791	-	131,413,774	-	131,413,774
2027	3,451,763,626	249,401,614	249,401,614	-	128,269,943	-	128,269,943
2028	3,573,545,058	259,596,151	259,596,151	-	124,487,742	-	124,487,742
2029	3,693,418,284	268,605,562	268,605,562	-	120,100,839	-	120,100,839
2030	3,812,737,197	276,668,535	276,668,535	-	115,343,602	-	115,343,602
2031	3,932,653,969	284,124,295	284,124,295	-	110,444,682	-	110,444,682
2032	4,053,984,216	291,381,332	291,381,332	-	105,608,983	-	105,608,983
2033	4,177,090,428	298,554,805	298,554,805	-	100,894,130	-	100,894,130
2034	4,302,238,743	305,173,116	305,173,116	-	96,159,193	-	96,159,193
2035	4,430,232,696	310,882,046	310,882,046	-	91,336,187	-	91,336,187
2036	4,562,277,714	315,530,180	315,530,180	-	86,435,239	-	86,435,239
2037	4,699,807,151	319,100,607	319,100,607	-	81,504,252	-	81,504,252
2038	4,844,382,676	322,153,405	322,153,405	-	76,721,672	-	76,721,672
2039	4,997,099,323	325,843,942	325,843,942	-	72,354,856	-	72,354,856
2040	5,157,874,366	330,874,448	330,874,448	-	68,505,266	-	68,505,267
2041	5,325,525,384	337,551,624	337,551,624	-	65,163,384	-	65,163,384
2042	5,389,348,438	345,865,043	345,865,043	-	62,254,794	-	62,254,794
2043	5,446,889,813	355,226,768	355,226,768	-	59,617,603	-	59,617,603
2044	5,496,482,195	365,387,239	365,387,239	-	57,177,466	-	57,177,466
2045	5,536,678,029	376,481,157	376,481,157	-	54,930,996	-	54,930,996
2046	5,565,818,134	388,825,802	388,825,802	-	52,897,117	-	52,897,117
2047	5,581,809,112	402,097,079	402,097,079	-	51,004,741	-	51,004,741
2048	5,582,849,600	414,562,589	414,562,589	-	49,031,190	-	49,031,190
2049	5,568,996,342	425,273,349	425,273,349	-	46,897,878	-	46,897,878
2050	5,541,321,412	434,850,457	434,850,457	-	44,712,366	-	44,712,366
2051	5,500,187,805	443,633,416	443,633,416	-	42,531,889	-	42,531,889
2052	5,445,529,342	451,314,859	451,314,859	-	40,343,424	-	40,343,424
2053	5,377,607,240	457,558,218	457,558,218	-	38,136,618	-	38,136,618
2054	5,297,098,821	462,308,806	462,308,806	-	35,927,805	-	35,927,805
2055	5,204,792,183	465,587,639	465,587,639	-	33,736,705	-	33,736,705
2056	5,101,499,143	467,347,296	467,347,296	-	31,575,021	-	31,575,021
2057	4,988,164,045	467,151,926	467,151,926	-	29,428,272	-	29,428,272
2058	4,866,350,876	464,921,498	464,921,498	-	27,307,940	-	27,307,940
2059	4,737,832,562	461,532,490	461,532,490	-	25,276,346	-	25,276,346
2060	4,603,443,326	457,504,846	457,504,846	-	23,362,021	-	23,362,021
2061	4,463,438,621	452,809,620	452,809,620	-	21,559,221	-	21,559,221
2062	4,318,118,672	447,408,440	447,408,440	-	19,862,060	-	19,862,060
2063	4,167,842,604	441,295,638	441,295,638	-	18,266,378	-	18,266,378
2064	4,012,998,475	434,524,114	434,524,114	-	16,770,244	-	16,770,244
2065	3,853,940,844	427,074,473	427,074,473	-	15,368,512	-	15,368,512
2066	3,691,066,500	418,884,863	418,884,863	-	14,054,829	-	14,054,829
2067	3,524,865,056	409,968,784	409,968,784	-	12,825,798	-	12,825,798

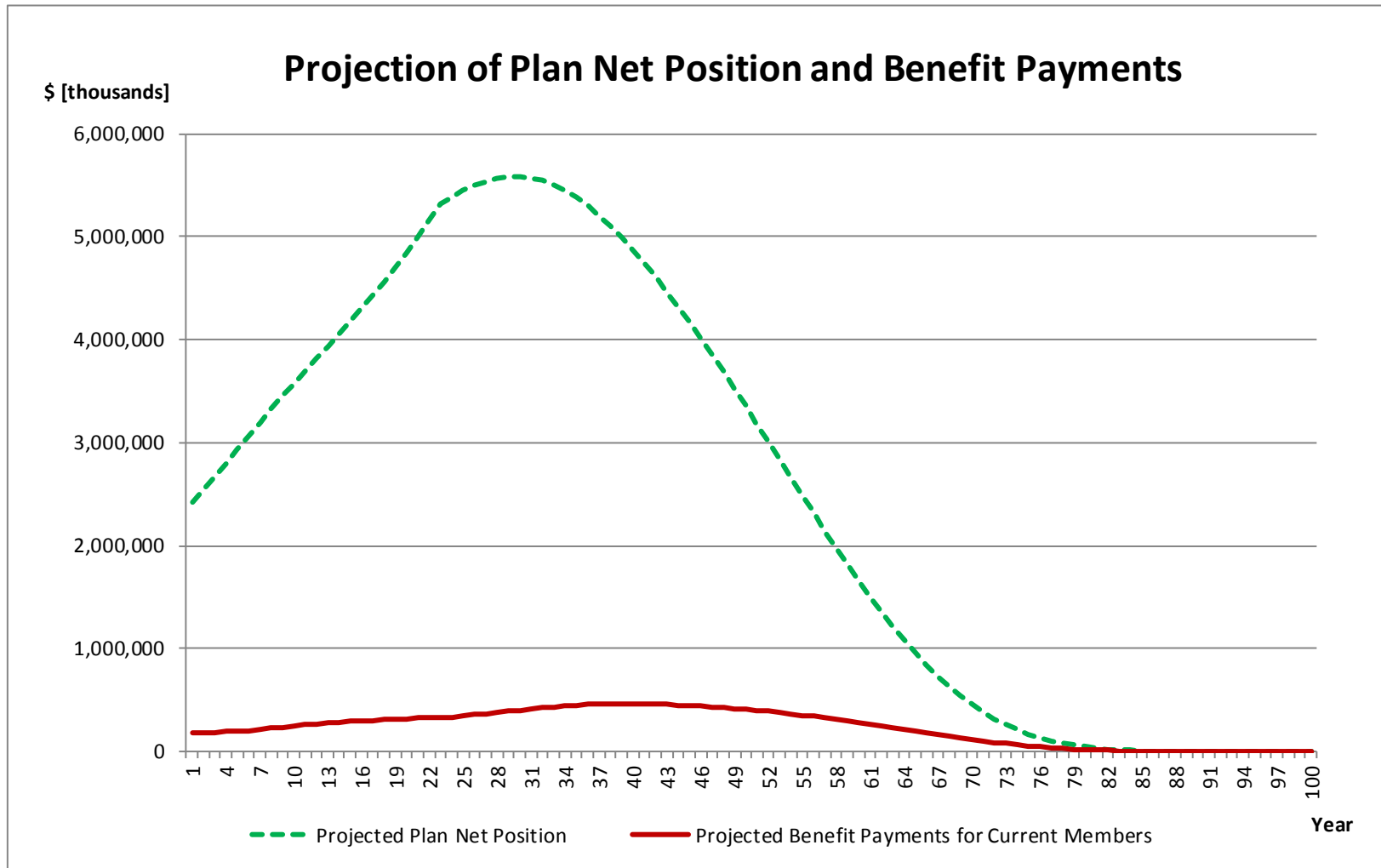
The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

Single Discount Rate Development

Present Values of Projected Benefits Ending June 30, 2117 (Concluded)

Fiscal 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 /(a)-.5)	(g)=(e)*vf ^a /(a)-.5)	(h)=(c)/(1+sdr) ^a /(a)-.5)
2068	\$ 3,355,847,639	\$ 400,308,087	\$ 400,308,087	\$ -	\$ 11,676,984	\$ -	\$ 11,676,984
2069	3,184,581,229	389,853,244	389,853,244	-	10,603,278	-	10,603,278
2070	3,011,725,205	378,636,420	378,636,420	-	9,602,053	-	9,602,053
2071	2,837,953,439	366,658,445	366,658,445	-	8,669,740	-	8,669,740
2072	2,663,987,799	353,950,714	353,950,714	-	7,803,508	-	7,803,508
2073	2,490,569,977	340,556,699	340,556,699	-	7,000,664	-	7,000,664
2074	2,318,450,417	326,452,350	326,452,350	-	6,257,089	-	6,257,089
2075	2,148,458,874	311,726,551	311,726,551	-	5,570,947	-	5,570,947
2076	1,981,393,214	296,467,114	296,467,114	-	4,940,085	-	4,940,085
2077	1,818,018,207	280,704,153	280,704,153	-	4,361,234	-	4,361,234
2078	1,659,122,882	264,514,450	264,514,450	-	3,831,887	-	3,831,887
2079	1,505,473,959	247,986,678	247,986,678	-	3,349,611	-	3,349,611
2080	1,357,801,909	231,221,549	231,221,549	-	2,912,038	-	2,912,038
2081	1,216,785,868	214,331,741	214,331,741	-	2,516,853	-	2,516,853
2082	1,083,037,515	197,440,564	197,440,564	-	2,161,775	-	2,161,775
2083	957,085,175	180,678,492	180,678,492	-	1,844,519	-	1,844,519
2084	839,360,357	164,177,695	164,177,695	-	1,562,765	-	1,562,765
2085	730,188,974	148,067,289	148,067,289	-	1,314,139	-	1,314,139
2086	629,786,858	132,470,282	132,470,282	-	1,096,234	-	1,096,234
2087	538,258,093	117,501,635	117,501,635	-	906,633	-	906,633
2088	455,595,261	103,267,656	103,267,656	-	742,941	-	742,941
2089	381,680,305	89,864,298	89,864,298	-	602,810	-	602,810
2090	316,287,244	77,375,105	77,375,105	-	483,946	-	483,946
2091	259,087,191	65,869,637	65,869,637	-	384,135	-	384,135
2092	209,655,379	55,400,509	55,400,509	-	301,242	-	301,242
2093	167,481,753	45,999,880	45,999,880	-	233,217	-	233,217
2094	131,985,979	37,676,739	37,676,739	-	178,107	-	178,107
2095	102,536,338	30,416,421	30,416,421	-	134,066	-	134,066
2096	78,470,497	24,182,339	24,182,339	-	99,383	-	99,383
2097	59,115,997	18,918,186	18,918,186	-	72,493	-	72,493
2098	43,809,936	14,550,417	14,550,417	-	51,987	-	51,987
2099	31,917,515	10,992,740	10,992,740	-	36,621	-	36,621
2100	22,847,280	8,151,264	8,151,264	-	25,319	-	25,319
2101	16,062,131	5,928,463	5,928,463	-	17,170	-	17,170
2102	11,087,026	4,227,487	4,227,487	-	11,416	-	11,416
2103	7,512,783	2,955,252	2,955,252	-	7,441	-	7,441
2104	4,996,955	2,025,529	2,025,529	-	4,755	-	4,755
2105	3,261,564	1,362,037	1,362,037	-	2,981	-	2,981
2106	2,087,480	899,102	899,102	-	1,835	-	1,835
2107	1,307,698	582,428	582,428	-	1,108	-	1,108
2108	799,335	369,717	369,717	-	656	-	656
2109	474,402	229,178	229,178	-	379	-	379
2110	271,456	137,420	137,420	-	212	-	212
2111	148,822	78,854	78,854	-	113	-	113
2112	77,949	43,141	43,141	-	58	-	58
2113	38,923	22,127	22,127	-	28	-	28
2114	18,831	10,580	10,580	-	12	-	12
2115	9,239	5,349	5,349	-	6	-	6
2116	4,369	3,266	3,266	-	3	-	3
2117	1,304	1,303	1,303	-	1	-	1
Totals					\$ 3,790,505,493	\$ -	\$ 3,790,505,493

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



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SECTION H

GLOSSARY OF TERMS

Glossary of Terms

<i>Accrued Service</i>	Service credited under the system that was rendered before the date of the actuarial valuation.
<i>Actuarial Accrued Liability (AAL)</i>	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."
<i>Actuarial Assumptions</i>	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.
<i>Actuarial Cost Method</i>	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.
<i>Actuarial Equivalent</i>	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.
<i>Actuarial Gain (Loss)</i>	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.
<i>Actuarial Present Value (APV)</i>	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
<i>Actuarial Valuation</i>	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.
<i>Actuarial Valuation Date</i>	The date as of which an actuarial valuation is performed.
<i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i>	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

<i>Amortization Method</i>	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).
<i>Amortization Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<i>Cost-of-Living Adjustments</i>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i>	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.
<i>Covered-Employee Payroll</i>	The payroll of employees that are provided with pensions through the pension plan.
<i>Deferred Inflows and Outflows</i>	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.
<i>Deferred Retirement Option Program (DROP)</i>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
<i>Discount Rate</i>	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: <ol style="list-style-type: none">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; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

Entry Age Actuarial Cost Method (EAN)

The EAN is a cost 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.

Fiduciary Net Position

The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.

GASB

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Long-Term Expected Rate of Return

The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.

Money-Weighted Rate of Return

The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

Municipal Bond Rate

The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.

Net Pension Liability (NPL)

The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.

Non-Employer Contributing Entities

Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contributing entities.

Normal Cost

The portion of the actuarial present value allocated to a valuation year is called the normal cost. For purposes of application to the requirements of this Statement, the term normal cost is the equivalent of service cost.

Glossary of Terms

<i>Other Postemployment Benefits (OPEB)</i>	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.
<i>Real Rate of Return</i>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<i>Service Cost</i>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<i>Total Pension Expense</i>	The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year: <ol style="list-style-type: none">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
<i>Total Pension Liability (TPL)</i>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<i>Unfunded Actuarial Accrued Liability (UAAL)</i>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<i>Valuation Assets</i>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.