

New Hampshire Retirement System

CAFR Schedules, GASB Statement Nos. 67 and 74

Plan Reporting and Accounting Schedules

June 30, 2019





October 31, 2019

Board of Trustees
New Hampshire Retirement System
54 Regional Drive
Concord, New Hampshire 03301-8509

Attention: Mr. George Lagos

Dear Board Members:

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report. This report should not be relied on for any purpose other than the purposes described below.

The purposes of this report are:

- To provide information in connection with Governmental Accounting Standards Board (GASB) Statement No. 67 "Financial Reporting for Pension Plans" as of June 30, 2019.
- To provide information in connection with Governmental Accounting Standards Board (GASB) Statement No. 74 "Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans" as of June 30, 2019.
- To provide supporting schedules for the Comprehensive Annual Financial Report (CAFR) for the System's use in the Actuarial Section, the Statistical Section, Notes to the Financial Statements, and Required Supplementary Information.

The report was based upon information, furnished by New Hampshire Retirement System (NHRS) staff, concerning Retirement System benefits, financial transactions, and active members, terminated members, retirees and beneficiaries as of June 30, 2019. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the data provided by NHRS.

We prepared the following supporting schedules for the Comprehensive Annual Financial Report for the System's use in the Actuarial Section, the Statistical Section, Notes to the Financial Statements and Required Supplementary Information:

- Summary of Actuarial Assumptions and Methods
 - Percent Retiring Within Next Year
 - Probabilities of Becoming Disabled Within Next Year
 - Percent Separating Within Next Year
 - Individual Employee Pay Increases
- Retirees and Beneficiaries Age Distribution
- Active Members by Valuation Division

- Active Members Age and Service Distribution
- Historical Membership Data – Active and Retired
- Summary of Membership Data by Category
- Schedule of Average Benefit Payment Amounts
- Schedule of Retired and Vested Members by Type of Benefit
- Solvency Test
- Schedule of Employer Contributions – Pension and OPEB
- Schedule of Changes in the Employers’ Net Pension Liability, Net OPEB Liability and Related Ratios
- Sensitivity of Net Pension Liability and Net OPEB Liability to the Single Discount Rate Assumption

The schedules include information regarding pension plan funding under the New Hampshire Statute RSA 100-A:16. The basic financial objective of the New Hampshire Retirement System (NHRS) is to establish and receive pension contributions which:

- When expressed in terms of percents of active member payroll will remain approximately level from generation to generation; and
- When combined with present assets and future investment return will be sufficient to meet the financial obligations of NHRS to present and future retirees and beneficiaries.

The financial objective for medical subsidy benefits under RSA 100-A:53, 53-b, 53-c and 53-d is to contribute the lesser of 25 percent of the total employer contribution or the minimum amount necessary to maintain the benefit. RSA 100-A:16 requires biennial actuarial valuations on June 30 of odd years. The Board has adopted an Actuarial Funding Policy which requires annual actuarial valuations. The financial objectives are addressed within the statutory biennial actuarial valuation. The valuation process develops pension contribution rates that are sufficient to fund the plan’s current pension cost (i.e., the costs assigned by the valuation method to the year of service about to be rendered), as well as to fund pension unfunded actuarial accrued liabilities as a level percent of active member payroll over a closed 30-year period beginning with the fiscal year ending June 30, 2010. Legislation was enacted in 2018 which requires the unfunded liability as of June 30, 2017 to be amortized through 2039. Each subsequent change in liability as calculated in odd-numbered years shall be separately amortized over a fixed period of no longer than 20 years.

The actuarial calculations for funding purposes as of June 30, 2019 in this report are based on the assumptions adopted by the Board pursuant to the June 30, 2015 experience study and the census information as of June 30, 2019. The actuarial accrued liability as of June 30, 2019 differs from the total pension (OPEB) liability as of June 30, 2019 under GASB Nos. 67 and 74 because the total pension (OPEB) liability is based on a roll-forward of the June 30, 2018 actuarial valuation under the System’s accounting procedures.



For funding purposes, assets are valued on a market related basis that recognizes each year's difference between actual and assumed investment return over a closed five-year period. For GASB Nos. 67 and 74 purposes, assets are reported and used on a market basis.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The actuarial assumptions are established by the Board after consulting with the actuary under New Hampshire Statute RSA 100-A:14 IX. We believe that the assumptions and methods used in this report are reasonable and appropriate for the purposes for which they have been used. However, other assumptions and methods could also be reasonable and could result in materially different results. In addition, because it is not possible or practical to consider every possible contingency, we may use summary information, estimates or simplifications of calculations to facilitate the modeling of future events. We may also exclude factors or data that are deemed to be immaterial. The actuarial funding method is the Individual Entry Age Actuarial Cost Method, in compliance with NHRS State Statutes. The assumptions and the methods comply with the requirements of Statement Nos. 67 and No. 74 of the Governmental Accounting Standards Board. Each actuarial valuation takes into account all prior differences between actual and assumed experience in each risk area and adjusts the contribution rates as needed. Actuarial methods and assumptions were adopted by the Board pursuant to the June 30, 2015 Experience Study.

We certify that the information contained in this June 30, 2019 accounting report of the NHRS is accurate and fairly presents the actuarial position of the New Hampshire Retirement System as of June 30, 2019 under the current actuarial assumptions. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes RSA 100-A:16, 100-A:53, 100-A:53-b, 100-A:53-c, and 100-A:53-d.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.



The actuaries submitting this report are independent of the plan sponsor, are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



David T. Kausch, FSA, EA, FCA, MAAA, PhD



Heidi G. Barry, ASA, FCA, MAAA

DTK/HGB:sc

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SECTION A

INTRODUCTION

Executive Summary

Pension

Covered Group	Employees	Teachers	Police	Fire	Total
I. Number of Participants as of June 30, 2019					
a. Actives	24,654	17,730	4,216	1,688	48,288
b. Retirees, Disabilities, and Beneficiaries ¹	18,824	13,740	4,082	1,706	38,352
c. Vested Terminations	1,366	1,034	125	27	2,552
d. Non-Vested Inactive Terminations	8,332	3,476	669	53	12,530
e. Total	53,176	35,980	9,092	3,474	101,722
f. Total Covered Annual Payroll	\$ 1,244,930,212	\$ 1,135,606,524	\$ 313,016,249	\$ 131,453,037	\$ 2,825,006,022
II. GASB No. 67 Information					
a. Total Pension Liability (TPL) ²					\$ 13,982,427,200
b. Plan Fiduciary Net Position (PFNP)					9,170,772,530
c. Net Pension Liability (NPL): a. – b.					4,811,654,670
d. PFNP as a Percentage of TPL: b. / a.					65.6%
III. Statutory Funding Information					
a. Actuarial Present Value of Projected Benefits	\$ 5,315,154,372	\$ 6,293,599,412	\$ 3,098,466,867	\$ 1,452,953,582	\$ 16,160,174,233
b. Actuarial Present Value of Future Normal Costs	702,818,631	789,112,822	391,092,067	201,806,708	2,084,830,228
c. Actuarial Accrued Liability (AAL): a. – b.	4,612,335,741	5,504,486,590	2,707,374,800	1,251,146,874	14,075,344,005
d. Actuarial Value of Assets	3,063,967,170	3,326,087,948	1,838,867,763	893,010,033	9,121,932,914
e. Unfunded Actuarial Accrued Liability (UAAL): c. – d.	\$ 1,548,368,571	\$ 2,178,398,642	\$ 868,507,037	\$ 358,136,841	\$ 4,953,411,091
f. Funded Status: d. / c.	66.4%	60.4%	67.9%	71.4%	64.8%
IV. Additional Information on Payroll					
State	\$ 567,292,108	\$ -	\$ 85,189,248	\$ 4,292,320	\$ 656,773,676
Political Subdivisions	677,638,104	1,135,606,524	227,827,001	127,160,717	2,168,232,346
Total	\$ 1,244,930,212	\$ 1,135,606,524	\$ 313,016,249	\$ 131,453,037	\$ 2,825,006,022

¹ Number counts for inactive plan members or beneficiaries currently receiving benefits include 2,371 additional data records which have resulted from additional annuities, survivor benefits, or members having benefits in more than one valuation group.

² GASB No. 67 TPL is based on a roll-forward of the June 30, 2018 valuation. Statutory Funding information is based on data/information provided as of June 30, 2019.

Executive Summary Medical Subsidy

Covered Group	State Employees	Political Subdivision Employees	Teachers	Police and Fire	Grand Total
I. Number of Participants Covered by Post Retirement Medical Subsidy as of June 30, 2019					
a. Actives	-	-	-	2,222	2,222
b. Retirees, Disabilities, and Beneficiaries	1,542	1,125	4,138	2,871	9,676
c. Vested Terminations	-	-	-	-	-
d. Total	1,542	1,125	4,138	5,093	11,898
e. Total NHRS Covered Annual Payroll	\$ 567,292,108	\$ 677,638,104	\$ 1,135,606,524	\$ 444,469,286	\$ 2,825,006,022
II. GASB No. 74 Information					
a. Total OPEB Liability (TOL)					\$ 475,253,737
b. Plan Fiduciary Net Position (PFNP)					36,842,621
c. Net OPEB Liability (NOL): a. – b.					438,411,116
d. PFNP as a Percentage of TOL: b. / a.					7.8%
III. Statutory Funding Information					
a. Actuarial Present Value of Projected Benefits	\$ 57,798,266	\$ 49,643,318	\$ 229,855,951	\$ 328,148,211	\$ 665,445,746
b. Actuarial Present Value of Future Normal Costs	-	-	-	7,848,302	7,848,302
c. Actuarial Accrued Liability (AAL): a. – b.	57,798,266	49,643,318	229,855,951	320,299,909	657,597,444
d. Valuation Assets	2,075,732	14,555,216	4,219,363	15,796,102	36,646,413
e. Unfunded Actuarial Accrued Liability (UAAL): c. – d.	55,722,534	35,088,102	225,636,588	304,503,807	620,951,031
f. Funded Status: d. / c.	3.6%	29.3%	1.8%	4.9%	5.6%

NOTE: GASB No. 74 TOL is based on a roll-forward of the June 30, 2018 valuation. Statutory Funding information is based on data/information provided as of June 30, 2019.

Discussion and Comments

Comment 1:

In total, plan experience between June 30, 2018 and June 30, 2019 was unfavorable for pension on the basis of statutory funding and GASB No. 67 and favorable for the medical subsidy on the basis of statutory funding.

Total covered payroll increased by 2.6% versus the assumed increase of 3.25% (2.75% for Teachers). Between the 2018 and 2019 valuation, the pension funded ratio increased by 1.2 percentage points from 63.6% to 64.8%.

The impact on GASB No. 67 was an increase in the ratio of plan fiduciary net position to total pension liability from 64.7% to 65.6%. See pages 7 and 8 for additional plan fiduciary net position information and page 9 for the impact on the net pension liability.

The dollar weighted rate of return for the year ending June 30, 2019 was 5.58% on the market value of assets (Note: This dollar weighted measure may differ from investment manager calculations and should not be used as a measure of investment performance). Please see pages 36 and 37 for additional asset information for statutory funding purposes.

On the basis of statutory funding, the rate of return was 6.55% on the actuarial value of assets, resulting in a recognized asset loss of approximately \$60 million (pension and medical subsidy combined). The return on the actuarial value of assets exceeds the return on the market value of assets because some of this year's market loss is deferred and prior years' returns are recognized this year.

The Market Value of Assets of the System of \$9.21 billion is greater than the Actuarial Value of Assets of \$9.16 billion by \$49 million as of the valuation date (see page 36). This difference will be gradually recognized over the next four years in the absence of future gains/losses.

Overall, the System had a loss of \$78 million comprised of an asset loss of \$60 million and a liability loss of \$18 million. See page 40 for additional information on gains and losses.

Discussion and Comments (Concluded)

Comment 2:

NHRS is supported by member contributions, employer contributions, and net earnings on the investments of the fund. The member contribution rate is set by statute at 7.00% of member compensation for Group I Members (Employees and Teachers), 11.55% of member compensation for Police Members and 11.80% of member compensation for Fire Members. The employer contributions are determined in accordance with statute by an actuarial valuation. Legislation was enacted in 2007 which requires the use of the entry-age actuarial cost method and a closed 30-year amortization of unfunded actuarial accrued liability in the determination of the employer contributions. Legislation was enacted in 2018 which requires the unfunded liability as of June 30, 2017 to be amortized through 2039. Each subsequent change in liability as calculated in odd-numbered years shall be separately amortized over a fixed period of no longer than 20 years. In particular, the June 30, 2019 actuarial valuation determines employer contribution rates for the 2022-23 biennium. The amortization periods are determined as of the beginning of that period based on the projected unfunded actuarial accrued liability as of June 30, 2021.

The closed amortization period means that the initial unfunded actuarial accrued liability is expected to be fully paid off by June 30, 2039 and the remainder by June 30, 2041 if all assumptions are met.

Comment 3:

Audit

The Segal Consulting firm recently completed an audit of the June 30, 2017 actuarial valuation and 2010-2015 experience study of the NHRS. We are pleased that Segal found our work to be reasonable and performed in accordance with generally accepted actuarial practices. As is typical with most actuarial audits, Segal provided several suggestions for improvement/clarification and we have reviewed and made some changes. In particular, NHRS has provided additional data for retiree contribution account balances as of the valuation date in order for us to better model the “cash refund” lump sum. We have also incorporated the Group I and Group II vesting tiers in the calculation of the deferred liabilities and reflected the time elapsed since date of termination.

The impact of these changes was a decrease in actuarial accrued liabilities and total pension liabilities of approximately \$166 million and an increase in the funded status of 0.7%.

Benefit Changes

House Bill No. 616 grants a one-time 1.5% COLA on the first \$50,000 of an annual pension benefit to members who retired on or before July 1, 2014, or any beneficiaries of such member, who is receiving a survivorship pension benefit. The COLA will take effect on the retired member’s first anniversary date of retirement occurring after July 1, 2020.

The impact of this change was an increase in actuarial accrued liabilities of approximately \$65 million and a decrease in the funded status of 0.2%. Please see pages 35 and 40 for further details.

Results of the Valuation

This report provides information in connection with Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 74, and it provides summaries of the member data, financial data, plan provisions, and actuarial assumptions and methods.

Calculations required for compliance with the GASB Statement Nos. 68 and 75 will be issued in separate reports.

Valuations for certifying contribution rates are prepared biennially, as of June 30 on the odd numbered years (2019, 2021, etc.). The June 30, 2017 actuarial valuation was the basis for the Fiscal Year 2020 and Fiscal Year 2021 employer contribution rates. The June 30, 2019 actuarial valuation will establish the fiscal year 2022 and 2023 employer contribution rates.

SECTION B

FINANCIAL SECTION

Measurement of the Net Pension Liability

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

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2018 rolled forward to the measurement date of June 30, 2019. The roll forward procedure increases the June 30, 2018 actuarial accrued liability with normal cost and interest and decreases it with actual benefit payments and administrative expenses paid.

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, shown on pages 15-20, used to determine this single discount rate assumed that employer contributions will be made under the current statute RSA 100-A:16 and that plan member contributions will be made under RSA 100-A:16. Based on these assumptions, the pension plan's fiduciary net position was projected to be sufficient to make all projected future benefit payments due to 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.

Below is a table providing the sensitivity of the net pension liability to changes in the discount rate. In particular, the table presents the plan's net pension liability calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher than the current single discount rate:

Sensitivity of the Net Pension Liability to the Single Discount Rate Assumption

Measurement Date	Net Pension Liability			Single Discount Rate Assumption
	1% Decrease	Current Single Discount Rate	1% Increase	
2013	\$5,517,542,052	\$4,303,784,472	\$3,283,507,050	7.75%
2014	\$4,944,083,125	\$3,753,585,752	\$2,749,222,899	7.75%
2015	\$5,214,835,524	\$3,961,527,090	\$2,893,074,359	7.75%
2016	\$6,832,747,755	\$5,317,595,337	\$4,061,016,509	7.25%
2017	\$6,479,208,704	\$4,917,992,831	\$3,638,638,217	7.25%
2018	\$6,406,666,255	\$4,815,202,417	\$3,481,507,071	7.25%
2019	\$6,443,003,824	\$4,811,654,670	\$3,463,357,380	7.25%

Statement of Fiduciary Net Position as of June 30, 2019 Pension

	2019*
Assets	
Cash and Deposits	\$ 233,768,535
Receivables	
Accounts Receivable - Sale of Investments	\$ 25,653,644
Interest and Dividend Receivables	16,454,715
Contributions	67,655,519
Accounts Receivable - Other	5,790,136
Total Receivables	\$ 115,554,014
Investments	
Fixed Income	\$ 2,096,908,486
Domestic Equities	3,475,269,284
International Equities	711,200,539
Real Estate	920,468,992
Other	1,660,508,134
Total Investments	\$ 8,864,355,435
Total Assets	\$ 9,213,677,984
 Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ 33,105,365
Accrued Expenses	9,800,089
Total Liabilities	\$ 42,905,454
Net Position Restricted for Pensions	\$ 9,170,772,530

* Reported amounts provided by the System as of June 30, 2019 do not include the 401(h) medical subsidy account.

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2019 Pension

	Total
Additions	
Contributions	
Employer	\$ 434,407,178
Member	223,995,134
Total Contributions	\$ 658,402,312
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 328,302,603
Interest and Dividends	187,145,184
Less Investment Expense	(27,177,949)
Net Investment Income	\$ 488,269,838
Total Additions	\$ 1,146,672,150
 Deductions	
Benefit Payments and Refunds	\$ 804,371,207
Pension Plan Administrative Expense	7,436,447
Other custodial, professional and non-investment expenses	958,942
Total Deductions	\$ 812,766,596
Net Increase in Net Position	\$ 333,905,554
 Net Position Restricted for Pensions	
Beginning of Year	\$ 8,836,866,976
End of Year	\$ 9,170,772,530

Schedules of Required Supplementary Information

Schedule of Changes in the Employers' Net Pension Liability and Related Ratios

Ultimately 10 Fiscal Years Will Be Displayed

Fiscal Year Ending	June 30, 2019	June 30, 2018	June 30, 2017	June 30, 2016	June 30, 2015	June 30, 2014	June 30, 2013
Total Pension Liability							
Service Cost	\$ 275,380,260	\$ 269,751,007	\$ 262,626,490	\$ 266,379,101	\$ 243,964,955	\$ 245,827,165	\$ 255,178,452
Interest on the Total Pension Liability	970,599,109	936,988,169	906,200,904	875,246,755	847,646,050	815,213,536	789,791,575
Benefit Changes	-	-	-	-	-	-	-
Difference between expected and actual experience of the Total Pension Liability	(111,250,355)	39,112,535	(19,046,986)	18,403,928	(106,715,500)	-	(101,140,741)
Assumption Changes	-	-	-	815,022,527	-	-	-
Benefit Payments	(780,906,714)	(741,752,669)	(706,303,846)	(670,359,868)	(631,310,997)	(599,475,606)	(573,470,316)
Refunds	(23,464,493)	(24,010,459)	(23,408,460)	(24,233,277)	(26,344,739)	(26,119,759)	(23,190,984)
Net Change in Total Pension Liability	\$ 330,357,807	\$480,088,583	\$ 420,068,102	\$ 1,280,459,166	\$ 327,239,769	\$ 435,445,336	\$ 347,167,986
Total Pension Liability - Beginning	\$ 13,652,069,393	\$13,171,980,810	\$ 12,751,912,708	\$ 11,471,453,542	\$ 11,144,213,773	\$ 10,708,768,437	\$ 10,361,600,451
Total Pension Liability - Ending (a)	\$ 13,982,427,200	\$ 13,652,069,393	\$ 13,171,980,810	\$ 12,751,912,708	\$ 11,471,453,542	\$ 11,144,213,773	\$ 10,708,768,437
Plan Fiduciary Net Position							
Contributions - Employer	\$ 434,407,178	\$ 422,659,079	\$ 366,653,014	\$ 357,481,725	\$ 332,294,226	\$ 328,444,256	\$ 249,835,597
Contributions - Member	223,995,134	217,571,830	213,060,827	207,949,398	204,063,168	199,032,996	196,488,619
Pension Plan Net Investment Income	488,269,838	717,090,294	978,594,418	61,877,808	249,804,954	1,092,585,321	813,797,720
Benefit Payments	(780,906,714)	(741,752,669)	(706,303,846)	(670,359,868)	(631,310,997)	(599,475,606)	(573,470,316)
Refunds	(23,464,493)	(24,010,459)	(23,408,460)	(24,233,277)	(26,344,739)	(26,119,759)	(23,190,984)
Pension Plan Administrative Expense	(7,436,447)	(7,767,254)	(7,670,827)	(7,061,317)	(7,581,315)	(7,376,270)	(6,998,526)
Other custodial, professional and non-investment expenses, and contributions other than for contribution effort	(958,942)	(911,824)	(1,254,518)	(1,263,550)	(1,626,866)	(1,446,882)	(1,804,939)
Net Change in Plan Fiduciary Net Position	\$ 333,905,554	\$582,878,997	\$ 819,670,608	\$ (75,609,081)	\$ 119,298,431	\$ 985,644,056	\$ 654,657,171
Plan Fiduciary Net Position - Beginning	\$ 8,836,866,976	\$8,253,987,979	\$ 7,434,317,371	\$ 7,509,926,452	\$ 7,390,628,021	\$ 6,404,983,965	\$ 5,750,326,794
Plan Fiduciary Net Position - Ending (b)	\$ 9,170,772,530	\$ 8,836,866,976	\$ 8,253,987,979	\$ 7,434,317,371	\$ 7,509,926,452	\$ 7,390,628,021	\$ 6,404,983,965
Net Pension Liability - Ending (a) - (b)	\$ 4,811,654,670	\$4,815,202,417	\$ 4,917,992,831	\$ 5,317,595,337	\$ 3,961,527,090	\$ 3,753,585,752	\$ 4,303,784,472
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	65.59 %	64.73 %	62.66 %	58.30 %	65.47 %	66.32 %	59.81 %
Covered Employee Payroll*	\$2,825,006,022	\$ 2,752,235,069	\$2,667,611,532	\$2,601,403,606	\$2,575,031,210	\$ 2,507,898,809	\$ 2,501,741,708
Net Pension Liability as a Percentage of Covered Employee Payroll	170.32 %	174.96 %	184.36 %	204.41 %	153.84 %	149.67 %	172.03 %

Notes to Schedule:

* Based on the June 30 census data for the applicable fiscal year. Covered employee payroll for employer's disclosure may differ.

Schedules of Required Supplementary Information Schedule of the Employers' Net Pension Liability Ultimately 10 Fiscal Years Will Be Displayed

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
2013	\$ 10,708,768,437	\$ 6,404,983,965	\$ 4,303,784,472	59.81%	\$ 2,501,741,708	172.03%
2014	11,144,213,773	7,390,628,021	3,753,585,752	66.32%	2,507,898,809	149.67%
2015	11,471,453,542	7,509,926,452	3,961,527,090	65.47%	2,575,031,210	153.84%
2016	12,751,912,708	7,434,317,371	5,317,595,337	58.30%	2,601,403,606	204.41%
2017	13,171,980,810	8,253,987,979	4,917,992,831	62.66%	2,667,611,532	184.36%
2018	13,652,069,393	8,836,866,976	4,815,202,417	64.73%	2,752,235,069	174.96%
2019	13,982,427,200	9,170,772,530	4,811,654,670	65.59%	2,825,006,022	170.32%

* Based on the June 30 census data. Covered-employee payroll for employer's disclosure may differ.

Schedule of Employer Pension Contributions Ultimately 10 Fiscal Years Will Be Displayed

FY Ending June 30,	Actuarially Determined Contribution*	Actual Contribution*	Contribution Deficiency (Excess)	Covered Payroll**	Actual Contribution as a % of Covered Payroll
2013	\$ 249,835,597	\$ 249,835,597	\$ -	\$ 2,501,741,708	9.99%
2014	328,444,256	328,444,256	-	2,507,898,809	13.10%
2015	332,294,226	332,294,226	-	2,575,031,210	12.90%
2016	357,481,725	357,481,725	-	2,601,403,606	13.74%
2017	366,653,014	366,653,014	-	2,667,611,532	13.74%
2018	422,659,079	422,659,079	-	2,752,235,069	15.36%
2019	434,407,178	434,407,178	-	2,825,006,022	15.38%

* We do not compute a dollar amount for the Actuarial Determined Contribution. It is our understanding that employers contribute the Actuarially Determined Contribution. The amount shown in this column, therefore, matches the actual contributions. Contributions other than the Actuarial Determined Contributions are accounted for separately.

** Based on the June 30 census data. Covered employee payroll for employer's disclosure may differ.

Notes to Schedule of Pension Contributions

Valuation Date:	Actuarially determined contribution rates for the 2018-2019 biennium were determined based on the June 30, 2015 actuarial valuation. Actuarially determined contribution rates for the 2020-2021 biennium were determined based on the June 30, 2017 actuarial valuation. Future employer contribution rates for the purposes of the projection in this report are based on the closed statutory amortization period.
Notes	<p>The roll-forward of total pension liability from June 30, 2018 to June 30, 2019 reflects expected service cost and interest reduced by actual benefit payments.</p> <p>The Total Pension Liability as of June 30, 2019 has been adjusted to reflect changes in actuarial methods based on the actuarial audit. The impact has been estimated based on the June 30, 2019 actuarial valuation and included in the difference between expected and actual experience of the Total Pension Liability on page 9. House Bill No. 616 grants a one-time adhoc COLA to certain retired members. The COLA will take effect on the retired member's first anniversary date of retirement occurring after July 1, 2020. This bill was adopted September 6, 2019 (after the measurement date) and therefore is not reflected in the development of the TPL.</p>
Methods and Assumptions:	
Actuarial Cost Method	Entry-Age Normal
Amortization Method	Level Percentage-of-Payroll, Closed
Remaining Amortization Period	21 years beginning July 1, 2018 (30 years beginning July 1, 2009)
Asset Valuation Method	5-year smoothed market for funding purposes; 20% corridor
Price Inflation	2.5% per year
Wage Inflation	3.25% per year (3.00% for Teachers)
Salary Increases	5.6% average, including inflation
Municipal Bond Rate	3.13% per year
Investment Rate of Return	7.25% per year, net of investment expenses, including inflation
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2015 valuation pursuant to an experience study of the period 2010 - 2015.
Mortality	RP-2014 Healthy Annuitant and Employee generational mortality tables for males and females with credibility adjustments, adjusted for fully generational mortality improvements using Scale MP-2015, based on the last experience study.

NOTE: A full list of actuarial assumptions and the summary of benefit provisions can be found starting on page 55. Actuarial assumptions for contributions made in the year ending June 30, 2019 can be found in the June 30, 2015 actuarial valuation report.

Summary of Pension Population Statistics as of June 30, 2018

For purposes of GASB No. 67 disclosures, the System has adopted a roll-forward methodology for accounting purposes. This means that the June 30, 2019 Total Pension Liability is based on a roll-forward of the June 30, 2018 valuation. A brief summary of the June 30, 2018 census data is shown below.

Inactive Plan Members or Beneficiaries Currently Receiving Benefits*	37,012
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	2,420
Active Plan Members	48,121
Non-Vested Inactive Members	<u>11,454</u>
Total Plan Members	99,007

**Number counts for inactive plan members or beneficiaries receiving benefits as of June 30, 2018 include 2,229 additional data records which have resulted from additional annuities, survivor benefits, or members having benefits in more than one valuation group.*

Additional information regarding the covered population as of June 30, 2018 may be found in the actuarial valuation report issued October 31, 2018.

Calculation of the Single Discount Rate for Pension

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 plan fiduciary net position is not projected to be sufficient to pay benefits).

The determination of the discount rate is done at the plan level. Our understanding is that all pension assets are available to pay the pension benefits of the four member classifications so there is one plan for the discount rate calculation. For the purpose of this valuation, the expected rate of return on pension plan investments is 7.25%; the municipal bond rate is 3.13% (based on the June 2019 20-Bond GO Index); and the resulting single discount rate is 7.25%.

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. Service Cost contributions for future hires after June 30, 2019 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 after June 30, 2019.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

Single Discount Rate Development

Projection of Pension Contributions Beginning July 1, 2019 (Years 1-50 only)

Year	Payroll for Current Employees	Contributions from Current Employees	Employer Service Cost and Expense Contributions	UAL Contributions	Total Contributions
0	\$ 2,825,006,022				
1	2,789,254,647	\$ 197,519,333	\$ 67,586,900	\$ 374,193,142	\$ 639,299,375
2	2,641,590,129	187,245,048	61,914,507	385,599,991	634,759,546
3	2,507,239,387	177,856,181	56,615,606	387,396,969	621,868,756
4	2,382,047,265	169,110,799	51,736,246	378,227,369	599,074,414
5	2,263,063,294	160,771,980	47,228,219	390,519,759	598,519,958
6	2,147,353,345	152,642,363	42,985,203	403,211,651	598,839,217
7	2,034,788,352	144,751,467	39,019,430	416,316,030	600,086,927
8	1,926,156,559	137,134,026	35,344,296	429,846,301	602,324,623
9	1,820,651,238	129,728,857	31,915,126	443,816,305	605,460,289
10	1,718,672,480	122,575,351	28,750,738	458,240,335	609,566,425
11	1,618,127,958	115,506,724	25,741,035	473,133,146	614,380,905
12	1,520,565,976	108,610,004	22,931,870	488,509,974	620,051,847
13	1,427,146,013	101,996,520	20,381,719	504,386,548	626,764,787
14	1,337,239,531	95,629,471	18,051,039	520,779,111	634,459,620
15	1,248,454,209	89,342,545	15,875,759	537,704,432	642,922,735
16	1,162,258,950	83,221,528	13,867,425	555,179,826	652,268,779
17	1,078,782,931	77,309,446	12,048,408	573,223,170	662,581,024
18	998,392,001	71,619,833	10,411,571	591,852,923	673,884,327
19	921,372,113	66,118,082	8,939,081	611,088,143	686,145,306
20	846,700,024	60,738,905	7,585,091	630,948,508	699,272,504
21	773,438,118	55,401,902	6,323,233	-	61,725,136
22	701,867,607	50,113,290	5,154,020	-	55,267,309
23	632,567,553	44,893,395	4,074,663	-	48,968,058
24	565,232,432	39,754,453	3,084,161	-	42,838,614
25	501,044,354	34,878,841	2,211,324	-	37,090,166
26	441,350,292	30,398,849	1,487,590	-	31,886,439
27	386,109,457	26,285,361	924,548	-	27,209,909
28	336,529,295	22,468,209	690,752	-	23,158,960
29	290,388,639	19,052,069	484,115	-	19,536,184
30	248,701,908	16,066,136	318,363	-	16,384,499
31	211,248,749	13,455,721	205,107	-	13,660,828
32	177,174,791	11,136,431	129,312	-	11,265,743
33	146,226,153	9,074,259	80,744	-	9,155,003
34	117,747,966	7,215,808	53,564	-	7,269,372
35	92,245,219	5,583,986	37,319	-	5,621,304
36	70,016,072	4,184,327	32,307	-	4,216,634
37	51,486,003	3,034,066	30,748	-	3,064,813
38	36,782,359	2,131,840	32,479	-	2,164,319
39	25,368,581	1,444,139	32,871	-	1,477,010
40	16,772,387	935,040	31,941	-	966,981
41	10,692,791	582,860	28,155	-	611,015
42	6,727,872	354,829	25,970	-	380,799
43	4,218,899	212,996	23,515	-	236,511
44	2,524,997	124,661	15,553	-	140,214
45	1,375,326	66,101	9,394	-	75,496
46	686,071	32,419	4,638	-	37,058
47	327,110	15,309	1,926	-	17,235
48	165,813	7,721	866	-	8,587
49	71,876	3,397	252	-	3,649
50	21,641	1,045	27	-	1,072

Single Discount Rate Development

Projection of Pension Plan Fiduciary Net Position

Beginning July 1, 2019

(Years 1-50)

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)
1	\$ 9,170,772,530	\$ 639,299,375	\$ 873,675,480	\$ 9,762,391	\$ 656,185,831	\$ 9,582,819,864
2	9,582,819,864	634,759,546	913,750,359	9,245,565	684,488,683	9,979,072,170
3	9,979,072,170	621,868,756	953,626,988	8,775,338	711,354,371	10,349,892,970
4	10,349,892,970	599,074,414	992,882,904	8,337,165	736,044,518	10,683,791,833
5	10,683,791,833	598,519,958	1,031,015,830	7,920,722	758,889,137	11,002,264,376
6	11,002,264,376	598,839,217	1,067,089,179	7,515,737	780,719,411	11,307,218,088
7	11,307,218,088	600,086,927	1,101,365,317	7,121,759	801,666,254	11,600,484,192
8	11,600,484,192	602,324,623	1,133,281,771	6,741,548	821,884,557	11,884,670,054
9	11,884,670,054	605,460,289	1,163,687,155	6,372,279	841,529,952	12,161,600,860
10	12,161,600,860	609,566,425	1,193,475,830	6,015,354	860,705,444	12,432,381,545
11	12,432,381,545	614,380,905	1,222,137,044	5,663,448	879,500,258	12,698,462,216
12	12,698,462,216	620,051,847	1,249,030,821	5,321,981	898,047,401	12,962,208,662
13	12,962,208,662	626,764,787	1,272,900,837	4,995,011	916,569,601	13,227,647,203
14	13,227,647,203	634,459,620	1,294,041,818	4,680,338	935,346,208	13,498,730,875
15	13,498,730,875	642,922,735	1,312,828,010	4,369,590	954,643,177	13,779,099,188
16	13,779,099,188	652,268,779	1,329,459,753	4,067,906	974,721,139	14,072,561,446
17	14,072,561,446	662,581,024	1,344,037,794	3,775,740	995,855,629	14,383,184,566
18	14,383,184,566	673,884,327	1,355,851,021	3,494,372	1,018,367,665	14,716,091,164
19	14,716,091,164	686,145,306	1,365,983,137	3,224,802	1,042,588,815	15,075,617,347
20	15,075,617,347	699,272,504	1,373,915,632	2,963,450	1,068,848,785	15,466,859,553
21	15,466,859,553	61,725,136	1,379,582,316	2,707,033	1,074,314,421	15,220,609,761
22	15,220,609,761	55,267,309	1,383,095,448	2,456,537	1,056,115,109	14,946,440,195
23	14,946,440,195	48,968,058	1,384,053,372	2,213,986	1,035,987,985	14,645,128,879
24	14,645,128,879	42,838,614	1,382,511,388	1,978,314	1,013,987,922	14,317,465,713
25	14,317,465,713	37,090,166	1,377,413,547	1,753,655	990,217,172	13,965,605,849
26	13,965,605,849	31,886,439	1,368,749,367	1,544,726	964,838,020	13,592,036,214
27	13,592,036,214	27,209,909	1,356,281,965	1,351,383	938,038,585	13,199,651,360
28	13,199,651,360	23,158,960	1,339,162,312	1,177,853	910,062,315	12,792,532,470
29	12,792,532,470	19,536,184	1,318,324,476	1,016,360	881,165,075	12,373,892,894
30	12,373,892,894	16,384,499	1,293,702,503	870,457	851,583,583	11,947,288,015
31	11,947,288,015	13,660,828	1,266,602,686	739,371	821,527,573	11,515,134,359
32	11,515,134,359	11,265,743	1,238,086,165	620,112	791,131,015	11,078,824,841
33	11,078,824,841	9,155,003	1,209,095,736	511,792	760,459,773	10,638,832,089
34	10,638,832,089	7,269,372	1,180,133,153	412,118	729,528,215	10,195,084,405
35	10,195,084,405	5,621,304	1,151,081,829	322,858	698,335,675	9,747,636,698
36	9,747,636,698	4,216,634	1,121,582,747	245,056	666,899,091	9,296,924,620
37	9,296,924,620	3,064,813	1,090,399,482	180,201	635,294,368	8,844,704,117
38	8,844,704,117	2,164,319	1,057,227,327	128,738	603,659,594	8,393,171,965
39	8,393,171,965	1,477,010	1,022,540,673	88,790	572,135,848	7,944,155,360
40	7,944,155,360	966,981	986,119,502	58,703	540,862,218	7,499,806,354
41	7,499,806,354	611,015	947,802,130	37,425	509,999,697	7,062,577,511
42	7,062,577,511	380,799	907,828,510	23,548	479,716,592	6,634,822,845
43	6,634,822,845	236,511	866,873,335	14,766	450,158,202	6,218,329,457
44	6,218,329,457	140,214	825,882,163	8,837	421,419,145	5,813,997,815
45	5,813,997,815	75,496	785,113,204	4,814	393,554,956	5,422,510,249
46	5,422,510,249	37,058	744,661,372	2,401	366,611,547	5,044,495,081
47	5,044,495,081	17,235	704,708,076	1,145	340,627,754	4,680,430,849
48	4,680,430,849	8,587	665,450,146	580	315,631,010	4,330,619,720
49	4,330,619,720	3,649	626,999,629	252	291,638,983	3,995,262,470
50	3,995,262,470	1,072	589,394,383	76	268,664,836	3,674,533,920

Single Discount Rate Development

Projection of Pension Plan Fiduciary Net Position

Beginning July 1, 2019

(Years 51-100)

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)
51	\$ 3,674,533,920	\$ 139	\$ 552,671,540	\$ 10	\$ 246,719,898	\$ 3,368,582,407
52	3,368,582,407	-	516,874,977	-	225,813,330	3,077,520,759
53	3,077,520,759	-	482,050,815	-	205,951,649	2,801,421,594
54	2,801,421,594	-	448,242,031	-	187,138,586	2,540,318,149
55	2,540,318,149	-	415,489,945	-	169,375,076	2,294,203,280
56	2,294,203,280	-	383,834,265	-	152,659,189	2,063,028,205
57	2,063,028,205	-	353,313,293	-	136,986,024	1,846,700,936
58	1,846,700,936	-	323,965,955	-	122,347,525	1,645,082,506
59	1,645,082,506	-	295,832,100	-	108,732,197	1,457,982,603
60	1,457,982,603	-	268,951,727	-	96,124,819	1,285,155,694
61	1,285,155,694	-	243,362,982	-	84,506,231	1,126,298,943
62	1,126,298,943	-	219,101,130	-	73,853,220	981,051,032
63	981,051,032	-	196,197,340	-	64,138,483	848,992,176
64	848,992,176	-	174,678,504	-	55,330,625	729,644,297
65	729,644,297	-	154,565,265	-	47,394,252	622,473,284
66	622,473,284	-	135,871,174	-	40,290,158	526,892,268
67	526,892,268	-	118,600,525	-	33,975,642	442,267,385
68	442,267,385	-	102,747,277	-	28,404,963	367,925,071
69	367,925,071	-	88,294,655	-	23,529,886	303,160,302
70	303,160,302	-	75,215,110	-	19,300,279	247,245,471
71	247,245,471	-	63,471,072	-	15,664,726	199,439,125
72	199,439,125	-	53,015,786	-	12,571,139	158,994,479
73	158,994,479	-	43,794,600	-	9,967,322	125,167,201
74	125,167,201	-	35,746,500	-	7,801,483	97,222,184
75	97,222,184	-	28,802,961	-	6,022,769	74,441,992
76	74,441,992	-	22,887,805	-	4,581,878	56,136,065
77	56,136,065	-	17,917,896	-	3,431,705	41,649,874
78	41,649,874	-	13,804,393	-	2,527,962	30,373,443
79	30,373,443	-	10,455,018	-	1,829,711	21,748,136
80	21,748,136	-	7,775,507	-	1,299,809	15,272,438
81	15,272,438	-	5,671,933	-	905,242	10,505,746
82	10,505,746	-	4,053,027	-	617,315	7,070,034
83	7,070,034	-	2,832,578	-	411,693	4,649,149
84	4,649,149	-	1,932,921	-	268,221	2,984,449
85	2,984,449	-	1,286,270	-	170,561	1,868,741
86	1,868,741	-	833,948	-	105,782	1,140,575
87	1,140,575	-	526,341	-	63,946	678,180
88	678,180	-	323,356	-	37,651	392,476
89	392,476	-	193,246	-	21,572	220,802
90	220,802	-	112,306	-	12,008	120,505
91	120,505	-	63,357	-	6,480	63,628
92	63,628	-	34,660	-	3,379	32,346
93	32,346	-	18,358	-	1,691	15,679
94	15,679	-	9,270	-	807	7,216
95	7,216	-	4,391	-	367	3,192
96	3,192	-	1,981	-	161	1,372
97	1,372	-	866	-	69	575
98	575	-	391	-	28	213
99	213	-	220	-	8	0
100	0	-	-	-	0	0

Single Discount Rate Development

Present Values of Projected Pension Benefit Payments

Beginning July 1, 2019

(Years 1-50)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^(a)-.5	(g)=(e)*vf^(a)-.5	(h)=(c)/(1+sdr)^(a)-.5
1	\$ 9,170,772,530	\$ 873,675,480	\$ 873,675,480	\$ -	\$ 843,628,993	\$ -	\$ 843,628,993
2	9,582,819,864	913,750,359	913,750,359	-	822,681,269	-	822,681,269
3	9,979,072,170	953,626,988	953,626,988	-	800,544,137	-	800,544,137
4	10,349,892,970	992,882,904	992,882,904	-	777,154,704	-	777,154,704
5	10,683,791,833	1,031,015,830	1,031,015,830	-	752,449,711	-	752,449,711
6	11,002,264,376	1,067,089,179	1,067,089,179	-	726,131,975	-	726,131,975
7	11,307,218,088	1,101,365,317	1,101,365,317	-	698,793,635	-	698,793,635
8	11,600,484,192	1,133,281,771	1,133,281,771	-	670,437,266	-	670,437,266
9	11,884,670,054	1,163,687,155	1,163,687,155	-	641,887,892	-	641,887,892
10	12,161,600,860	1,193,475,830	1,193,475,830	-	613,817,506	-	613,817,506
11	12,432,381,545	1,222,137,044	1,222,137,044	-	586,068,324	-	586,068,324
12	12,698,462,216	1,249,030,821	1,249,030,821	-	558,475,590	-	558,475,590
13	12,962,208,662	1,272,900,837	1,272,900,837	-	530,674,612	-	530,674,612
14	13,227,647,203	1,294,041,818	1,294,041,818	-	503,019,417	-	503,019,417
15	13,498,730,875	1,312,828,010	1,312,828,010	-	475,824,688	-	475,824,688
16	13,779,099,188	1,329,459,753	1,329,459,753	-	449,279,943	-	449,279,943
17	14,072,561,446	1,344,037,794	1,344,037,794	-	423,502,538	-	423,502,538
18	14,383,184,566	1,355,851,021	1,355,851,021	-	398,344,851	-	398,344,851
19	14,716,091,164	1,365,983,137	1,365,983,137	-	374,192,667	-	374,192,667
20	15,075,617,347	1,373,915,632	1,373,915,632	-	350,923,699	-	350,923,699
21	15,466,859,553	1,379,582,316	1,379,582,316	-	328,551,120	-	328,551,120
22	15,220,609,761	1,383,095,448	1,383,095,448	-	307,121,474	-	307,121,474
23	14,946,440,195	1,384,053,372	1,384,053,372	-	286,558,680	-	286,558,680
24	14,645,128,879	1,382,511,388	1,382,511,388	-	266,889,905	-	266,889,905
25	14,317,465,713	1,377,413,547	1,377,413,547	-	247,930,798	-	247,930,798
26	13,965,605,849	1,368,749,367	1,368,749,367	-	229,716,801	-	229,716,801
27	13,592,036,214	1,356,281,965	1,356,281,965	-	212,237,203	-	212,237,203
28	13,199,651,360	1,339,162,312	1,339,162,312	-	195,392,300	-	195,392,300
29	12,792,532,470	1,318,324,476	1,318,324,476	-	179,349,116	-	179,349,116
30	12,373,892,894	1,293,702,503	1,293,702,503	-	164,102,064	-	164,102,064
31	11,947,288,015	1,266,602,686	1,266,602,686	-	149,803,765	-	149,803,765
32	11,515,134,359	1,238,086,165	1,238,086,165	-	136,532,453	-	136,532,453
33	11,078,824,841	1,209,095,736	1,209,095,736	-	124,322,121	-	124,322,121
34	10,638,832,089	1,180,133,153	1,180,133,153	-	113,141,370	-	113,141,370
35	10,195,084,405	1,151,081,829	1,151,081,829	-	102,896,196	-	102,896,196
36	9,747,636,698	1,121,582,747	1,121,582,747	-	93,481,816	-	93,481,816
37	9,296,924,620	1,090,399,482	1,090,399,482	-	84,739,160	-	84,739,160
38	8,844,704,117	1,057,227,327	1,057,227,327	-	76,607,202	-	76,607,202
39	8,393,171,965	1,022,540,673	1,022,540,673	-	69,085,119	-	69,085,119
40	7,944,155,360	986,119,502	986,119,502	-	62,120,675	-	62,120,675
41	7,499,806,354	947,802,130	947,802,130	-	55,670,740	-	55,670,740
42	7,062,577,511	907,828,510	907,828,510	-	49,718,250	-	49,718,250
43	6,634,822,845	866,873,335	866,873,335	-	44,266,008	-	44,266,008
44	6,218,329,457	825,882,163	825,882,163	-	39,321,991	-	39,321,991
45	5,813,997,815	785,113,204	785,113,204	-	34,853,981	-	34,853,981
46	5,422,510,249	744,661,372	744,661,372	-	30,823,478	-	30,823,478
47	5,044,495,081	704,708,076	704,708,076	-	27,197,862	-	27,197,862
48	4,680,430,849	665,450,146	665,450,146	-	23,946,593	-	23,946,593
49	4,330,619,720	626,999,629	626,999,629	-	21,037,697	-	21,037,697
50	3,995,262,470	589,394,383	589,394,383	-	18,439,095	-	18,439,095

Single Discount Rate Development

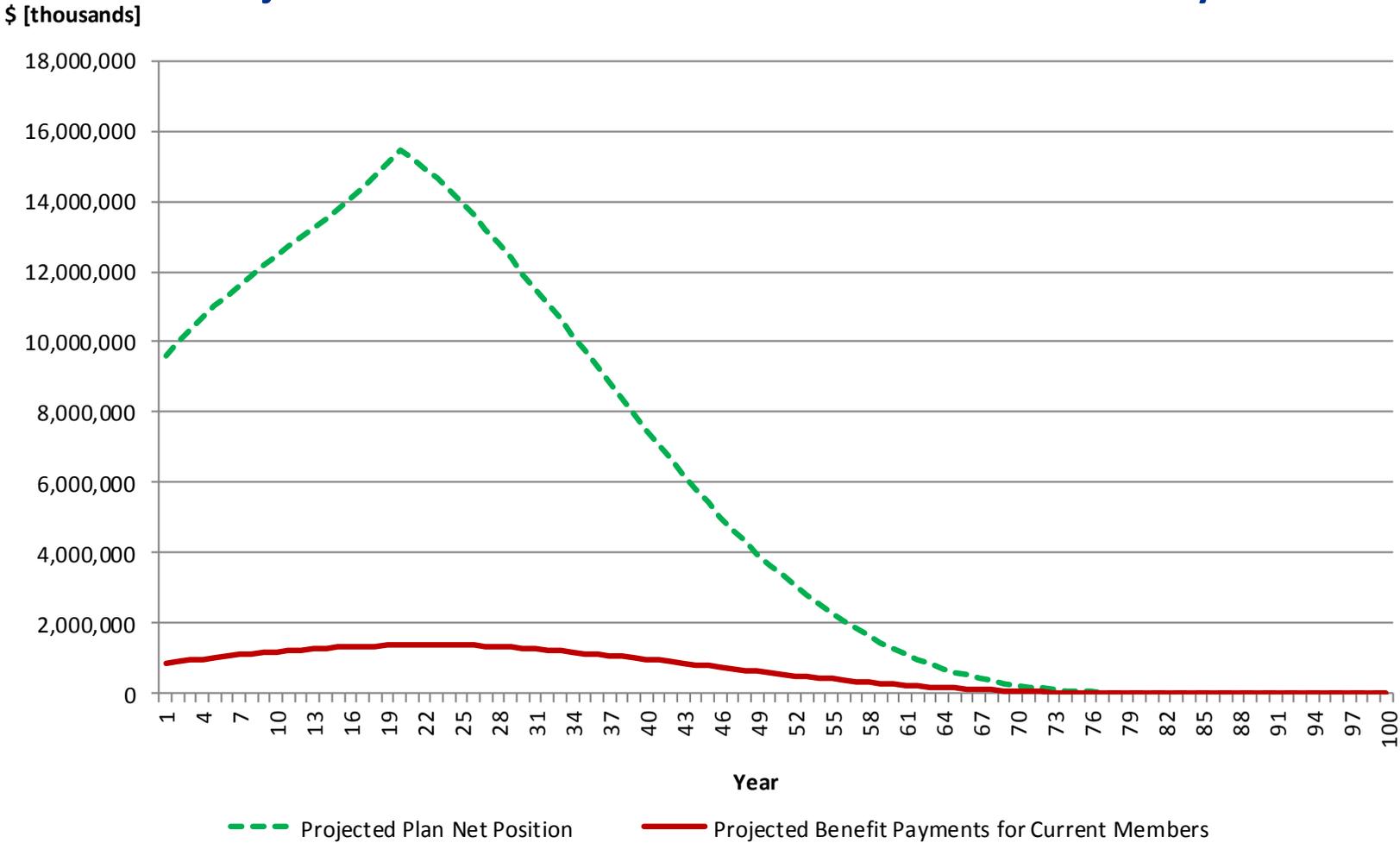
Present Values of Projected Pension Benefit Payments

Beginning July 1, 2019 (Concluded)

(Years 51-100)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^{-(a)-.5}	(g)=(e)*vf ^{-(a)-.5}	(h)=(c)/(1+sdr) ^{-(a)-.5}
51	\$ 3,674,533,920	\$552,671,540	\$ 552,671,540	\$ -	\$ 16,121,424	\$ -	\$ 16,121,424
52	3,368,582,407	516,874,977	516,874,977	-	14,058,032	-	14,058,032
53	3,077,520,759	482,050,815	482,050,815	-	12,224,596	-	12,224,596
54	2,801,421,594	448,242,031	448,242,031	-	10,598,807	-	10,598,807
55	2,540,318,149	415,489,945	415,489,945	-	9,160,256	-	9,160,256
56	2,294,203,280	383,834,265	383,834,265	-	7,890,301	-	7,890,301
57	2,063,028,205	353,313,293	353,313,293	-	6,771,930	-	6,771,930
58	1,846,700,936	323,965,955	323,965,955	-	5,789,680	-	5,789,680
59	1,645,082,506	295,832,100	295,832,100	-	4,929,504	-	4,929,504
60	1,457,982,603	268,951,727	268,951,727	-	4,178,640	-	4,178,640
61	1,285,155,694	243,362,982	243,362,982	-	3,525,476	-	3,525,476
62	1,126,298,943	219,101,130	219,101,130	-	2,959,447	-	2,959,447
63	981,051,032	196,197,340	196,197,340	-	2,470,938	-	2,470,938
64	848,992,176	174,678,504	174,678,504	-	2,051,213	-	2,051,213
65	729,644,297	154,565,265	154,565,265	-	1,692,334	-	1,692,334
66	622,473,284	135,871,174	135,871,174	-	1,387,088	-	1,387,088
67	526,892,268	118,600,525	118,600,525	-	1,128,928	-	1,128,928
68	442,267,385	102,747,277	102,747,277	-	911,911	-	911,911
69	367,925,071	88,294,655	88,294,655	-	730,667	-	730,667
70	303,160,302	75,215,110	75,215,110	-	580,354	-	580,354
71	247,245,471	63,471,072	63,471,072	-	456,632	-	456,632
72	199,439,125	53,015,786	53,015,786	-	355,630	-	355,630
73	158,994,479	43,794,600	43,794,600	-	273,915	-	273,915
74	125,167,201	35,746,500	35,746,500	-	208,464	-	208,464
75	97,222,184	28,802,961	28,802,961	-	156,617	-	156,617
76	74,441,992	22,887,805	22,887,805	-	116,040	-	116,040
77	56,136,065	17,917,896	17,917,896	-	84,702	-	84,702
78	41,649,874	13,804,393	13,804,393	-	60,845	-	60,845
79	30,373,443	10,455,018	10,455,018	-	42,967	-	42,967
80	21,748,136	7,775,507	7,775,507	-	29,795	-	29,795
81	15,272,438	5,671,933	5,671,933	-	20,265	-	20,265
82	10,505,746	4,053,027	4,053,027	-	13,502	-	13,502
83	7,070,034	2,832,578	2,832,578	-	8,798	-	8,798
84	4,649,149	1,932,921	1,932,921	-	5,598	-	5,598
85	2,984,449	1,286,270	1,286,270	-	3,473	-	3,473
86	1,868,741	833,948	833,948	-	2,100	-	2,100
87	1,140,575	526,341	526,341	-	1,236	-	1,236
88	678,180	323,356	323,356	-	708	-	708
89	392,476	193,246	193,246	-	394	-	394
90	220,802	112,306	112,306	-	214	-	214
91	120,505	63,357	63,357	-	112	-	112
92	63,628	34,660	34,660	-	57	-	57
93	32,346	18,358	18,358	-	28	-	28
94	15,679	9,270	9,270	-	13	-	13
95	7,216	4,391	4,391	-	6	-	6
96	3,192	1,981	1,981	-	2	-	2
97	1,372	866	866	-	1	-	1
98	575	391	391	-	-	-	-
99	213	220	220	-	-	-	-
100	-	-	-	-	-	-	-
Totals					\$ 15,884,692,090	\$ -	\$ 15,884,692,090

Projection of Pension Plan Net Position and Benefit Payments



Measurement of the Net OPEB Liability

Regarding the sensitivity of the net OPEB liability to changes in the Single Discount Rate, the following presents the plan's net OPEB liability, calculated using a Single Discount Rate of 7.25%, as well as what the plan's net OPEB liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

Sensitivity of Net OPEB Liability to the Single Discount Rate Assumption

Measurement Date June 30	Net OPEB Liability			Single Discount Rate Assumption
	1% Decrease	Current Single Discount Rate	1% Increase	
2016	\$ 526,463,381	\$ 484,105,215	\$ 447,486,556	7.25%
2017	497,606,504	457,233,955	422,254,184	7.25%
2018	476,527,879	457,845,765	405,513,854	7.25%
2019	475,523,490	438,411,116	406,162,814	7.25%

GASB No. 74 requires the sensitivity of the Net OPEB Liability to the healthcare cost trend assumption. Since the medical subsidy benefits are a fixed stipend, there is no sensitivity to change in the healthcare cost trend assumption.

Statement of Fiduciary Net Position as of June 30, 2019 OPEB

Assets

Cash and Deposits	\$	823,698
Receivables		
Accounts Receivable - Sale of Investments	\$	90,392
Accrued Interest and Other Dividends		57,979
Contributions		4,767,206
Accounts Receivable - Other		20,402
Total Receivables	\$	4,935,979
Investments		
Fixed Income	\$	7,388,591
Domestic Equities		12,245,334
International Equities		2,505,961
Real Estate		3,243,331
Other		5,850,907
Total Investments	\$	31,234,124
Total Assets		\$ 36,993,801

Liabilities

Payables		
Accounts Payable - Purchase of Investments	\$	116,649
Accrued Expenses		-
Accounts Payable - Other		34,531
Total Liabilities	\$	151,180
Net Position Restricted for OPEB		\$ 36,842,621

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2019 OPEB

Additions

Contributions	
Employer	\$ 45,509,112
Nonemployer contributing entities	0
Active Employees	0
Other	0
Total Contributions	<u>\$ 45,509,112</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 1,352,522
Interest and Dividends	735,553
Less Investment Expense	<u>(107,270)</u>
Net Investment Income	<u>\$ 1,980,805</u>
Other	<u>\$ 0</u>
Total Additions	<u>\$ 47,489,917</u>

Deductions

Benefit Payments	\$ 47,797,941
OPEB Plan Administrative Expense	151,772
Other	<u>5,842</u>
Total Deductions	<u>\$ 47,955,555</u>
Net Increase in Net Position	\$ (465,638)

Net Position Restricted for OPEB

Beginning of Year	<u>\$ 37,308,259</u>
End of Year	<u><u>\$ 36,842,621</u></u>

Schedules of Required Supplementary Information

Schedule of Changes in Net OPEB Liability and Related Ratios

Ultimately 10 Fiscal Years Will Be Displayed

Fiscal year ending June 30,	2019	2018	2017	2016
Total OPEB liability				
Service cost	\$ 856,820	\$ 983,597	\$ 1,099,249	\$ 1,217,827
Interest on the total OPEB liability	34,197,051	34,247,087	35,235,164	36,541,607
Changes of benefit terms	0	0	-	-
Difference between expected and actual experience	(7,156,217)	12,666,860	-	(4,537,602)
Changes of assumptions	0	0	-	-
Benefit payments, including refunds of employee contributions	(47,797,941)	(49,250,676)	(50,559,778)	(51,805,133)
Net change in total OPEB liability	(19,900,287)	(1,353,132)	(14,225,365)	(18,583,301)
Total OPEB liability - beginning	495,154,024	496,507,156	510,732,521	529,315,822
Total OPEB liability - ending (a)	<u>\$ 475,253,737</u>	<u>\$ 495,154,024</u>	<u>\$ 496,507,156</u>	<u>\$ 510,732,521</u>
Plan fiduciary net position				
Contributions - Employer	\$ 45,509,112	\$ 44,194,281	\$ 59,196,827	\$ 58,174,145
Nonemployer contributing entities contributions	0	0	0	0
Contributions - Member	0	0	0	0
OPEB plan net investment income	1,980,805	3,128,478	4,045,745	148,536
Benefit payments, including refunds of employee contributions	(47,797,941)	(49,250,676)	(50,559,778)	(51,805,133)
OPEB plan administrative expense	(151,772)	(33,144)	(31,713)	(16,951)
Other custodial, professional and non-investment expenses, and contributions other than for contribution effort	(5,842)	(3,881)	(5,186)	(3,030)
Net change in plan fiduciary net position	(465,638)	(1,964,942)	12,645,895	6,497,567
Plan fiduciary net position - beginning	37,308,259	39,273,201	26,627,306	20,129,739
Plan fiduciary net position - ending (b)	<u>\$ 36,842,621</u>	<u>\$ 37,308,259</u>	<u>\$ 39,273,201</u>	<u>\$ 26,627,306</u>
Net OPEB liability - ending (a) - (b)	<u>\$ 438,411,116</u>	<u>\$ 457,845,765</u>	<u>\$ 457,233,955</u>	<u>\$ 484,105,215</u>
Plan fiduciary net position as a percentage of total OPEB liability	7.75 %	7.53 %	7.91 %	5.21 %
Covered-Employee Payroll*	\$ 2,825,006,022	\$ 2,752,235,069	\$ 2,667,611,532	\$ 2,601,403,606
Net OPEB liability as a percentage of covered-employee payroll	15.52 %	16.64 %	17.14 %	18.61 %

Notes to Schedule:

* Based on the June 30 census data for the applicable fiscal year.

Covered-Employee payroll for employer's disclosure may differ.

Schedules of Required Supplementary Information

Schedule of the Employers' Net OPEB Liability

Ultimately 10 Fiscal Years Will Be Displayed

FY Ending June 30,	Total OPEB Liability	Plan Net Position	Net OPEB Liability	Plan Net Position as a % of Total OPEB Liability	Covered Payroll*	Net OPEB Liability as a % of Covered Payroll
2016	\$ 510,732,521	\$ 26,627,306	\$ 484,105,215	5.21 %	\$ 2,601,403,606	18.61 %
2017	496,507,156	39,273,201	457,233,955	7.91 %	2,667,611,532	17.14 %
2018	495,154,024	37,308,259	457,845,765	7.53 %	2,752,235,069	16.64 %
2019	475,253,737	36,842,621	438,411,116	7.75 %	2,825,006,022	15.52 %

* Based on the June 30 census data. Covered-employee payroll for employer's disclosure may differ.

Schedule of OPEB Contributions

Ultimately 10 Fiscal Years Will Be Displayed

FY Ending June 30,	Actuarially Determined Contribution*	Actual Contribution*	Contribution Deficiency (Excess)	Covered Payroll**	Actual Contribution as a % of Covered Payroll
2016	\$ 58,174,145	\$ 58,174,145	\$ -	\$ 2,601,403,606	2.24 %
2017	59,196,827	59,196,827	-	2,667,611,532	2.22 %
2018	44,194,281	44,194,281	-	2,752,235,069	1.61 %
2019	45,509,112	45,509,112	-	2,825,006,022	1.61 %

* We do not compute a dollar amount for the Actuarial Determined Contribution. It is our understanding that employers contribute the Actuarially Determined Contribution. The amount shown in this column, therefore, matches the actual contributions. Contributions other than the Actuarially Determined Contributions are accounted for separately.

** Based on the June 30 census data. Covered employee payroll for employer's disclosure may differ.

Notes to Schedule of OPEB Contributions

Valuation Date: Actuarially determined contribution rates for the 2018-2019 biennium were determined based on the June 30, 2015 actuarial valuation. Actuarially determined contribution rates for the 2020-2021 biennium were determined based on the June 30, 2017 actuarial valuation. Future employer contribution rates for the purposes of the projection in this report are based on the statutory requirement of solvency funding with the Board's funding policy to maintain a 20% margin.

Methods and Assumptions:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Closed
Remaining Amortization Period	Not applicable under statutory funding
Asset Valuation Method	5-Year smoothed market; 20% corridor
Price Inflation	2.5% per year
Wage Inflation	3.25% per year (3.00% for Teachers)
Salary Increases	5.6% average, including inflation
Municipal Bond Rate	3.13% per year
Investment Rate of Return	7.25% per year, net of OPEB plan investment expense, including inflation for determining solvency contributions
Funding Discount Rate	3.25% per year
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2015 valuation pursuant to an experience study of the period 2010 - 2015.
Mortality	RP-2014 Healthy Annuitant and Employee generational mortality tables for males and females with credibility adjustments, adjusted for fully generational mortality improvements using Scale MP-2015, based on the last experience study.
Health Care Trend Rates	Not applicable, given that the benefits are fixed stipends.
Aging Factors	Not applicable, given that the benefits are fixed stipends.

NOTE: A full list of actuarial assumptions and the summary of benefit provisions can be found starting on page 55.

Summary of OPEB Participant Data As of June 30, 2018

For purposes of GASB No. 74 disclosures, the System has adopted a roll-forward methodology for accounting purposes. This means that the June 30, 2019 Total OPEB Liability is based on a roll-forward of the June 30, 2018 valuation. A brief summary of the June 30, 2018 census data is shown below.

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	9,869
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	-
Active Plan Members	<u>2,427</u>
Total Plan Members	12,296

Additional information regarding the covered population as of June 30, 2018 may be found in the actuarial valuation report issued October 31, 2018.

Calculation of the Single Discount Rate for OPEB

GASB Statement No. 74 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total OPEB 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 OPEB 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 OPEB plan investments is 7.25%; the municipal bond rate is 3.13%; and the resulting Single Discount Rate is 7.25%.

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. Since the medical subsidy plan is closed to new hires, normal cost contributions for future hires are not included.

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.

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 OPEB Plan Net Position Beginning July 1, 2019 (Years 1-50)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.250%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	\$ 36,842,621	\$ 46,486,094	\$ 48,930,533	\$ 36,321	\$ 2,582,736	\$ 36,944,597
2	36,944,597	47,892,923	48,650,600	34,720	2,650,261	38,802,461
3	38,802,461	17,381,359	48,248,049	33,202	1,712,655	9,615,226
4	9,615,226	46,848,796	47,611,631	31,706	668,806	9,489,491
5	9,489,491	45,962,638	46,759,773	30,215	658,521	9,320,663
6	9,320,663	44,874,711	45,701,399	28,698	645,283	9,110,560
7	9,110,560	43,624,988	44,471,592	27,175	629,395	8,866,176
8	8,866,176	42,225,457	43,086,471	25,669	611,218	8,590,711
9	8,590,711	40,767,229	41,625,174	24,185	591,409	8,299,988
10	8,299,988	39,218,107	40,074,455	22,690	570,442	7,991,393
11	7,991,393	37,584,213	38,437,169	21,209	548,242	7,665,470
12	7,665,470	35,868,178	36,715,999	19,790	524,846	7,322,705
13	7,322,705	34,114,419	34,948,592	18,429	500,530	6,970,633
14	6,970,633	32,341,339	33,156,913	17,099	475,715	6,613,674
15	6,613,674	30,547,428	31,343,533	15,779	450,576	6,252,366
16	6,252,366	28,762,216	29,533,669	14,462	425,306	5,891,757
17	5,891,757	26,987,069	27,732,848	13,128	400,123	5,532,974
18	5,532,974	25,230,401	25,949,098	11,753	375,125	5,177,648
19	5,177,648	23,499,813	24,190,210	10,315	350,423	4,827,360
20	4,827,360	21,831,542	22,487,924	8,830	326,292	4,488,440
21	4,488,440	20,195,655	20,822,646	7,414	302,817	4,156,851
22	4,156,851	18,651,949	19,240,994	6,144	280,174	3,841,836
23	3,841,836	17,200,429	17,750,991	5,028	258,745	3,544,991
24	3,544,991	15,816,396	16,333,323	4,081	238,456	3,262,438
25	3,262,438	14,538,888	15,017,344	3,288	219,369	3,000,063
26	3,000,063	13,360,063	13,801,588	2,638	201,685	2,757,586
27	2,757,586	12,270,308	12,677,756	2,107	185,338	2,533,369
28	2,533,369	11,265,887	11,641,296	1,672	170,239	2,326,527
29	2,326,527	10,338,139	10,684,179	1,321	156,302	2,135,468
30	2,135,468	9,483,707	9,802,211	1,036	143,441	1,959,369
31	1,959,369	8,700,036	8,992,535	808	131,608	1,797,670
32	1,797,670	7,978,604	8,247,523	626	120,731	1,648,857
33	1,648,857	7,314,025	7,561,346	479	110,717	1,511,773
34	1,511,773	6,702,861	6,930,120	365	101,497	1,385,646
35	1,385,646	6,140,525	6,349,328	275	93,013	1,269,581
36	1,269,581	5,622,479	5,814,391	205	85,202	1,162,666
37	1,162,666	5,144,233	5,320,755	151	78,001	1,063,994
38	1,063,994	4,701,513	4,864,048	110	71,347	972,696
39	972,696	4,290,510	4,440,325	79	65,182	887,984
40	887,984	3,907,843	4,046,068	55	59,454	809,156
41	809,156	3,550,684	3,678,299	38	54,117	735,620
42	735,620	3,216,710	3,334,554	26	49,134	666,884
43	666,884	2,904,067	3,012,855	17	44,474	602,554
44	602,554	2,611,345	2,711,675	11	40,111	542,324
45	542,324	2,337,524	2,429,897	6	36,028	485,973
46	485,973	2,081,897	2,166,735	4	32,211	433,343
47	433,343	1,843,981	1,921,646	2	28,651	384,327
48	384,327	1,623,432	1,694,251	1	25,341	338,849
49	338,849	1,419,977	1,484,253	0	22,277	296,850
50	296,850	1,233,344	1,291,374	0	19,455	258,275

Single Discount Rate Development

Projection of OPEB Plan Net Position Beginning July 1, 2019

(Years 51-100)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.250%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	\$ 258,275	\$ 1,063,241	\$ 1,115,321	\$ 0	\$ 16,870	\$ 223,064
52	223,064	909,266	955,707	0	14,518	191,141
53	191,141	770,942	812,064	0	12,393	162,413
54	162,413	647,725	683,855	0	10,488	136,771
55	136,771	538,961	570,439	0	8,795	114,088
56	114,088	443,895	471,072	0	7,303	94,214
57	94,214	361,675	384,910	0	6,003	76,982
58	76,982	291,365	311,024	0	4,881	62,205
59	62,205	231,976	248,421	0	3,924	49,684
60	49,684	182,473	196,063	0	3,118	39,213
61	39,213	141,784	152,870	0	2,448	30,574
62	30,574	108,829	117,752	0	1,899	23,550
63	23,550	82,555	89,634	0	1,455	17,927
64	17,927	61,951	67,484	0	1,103	13,497
65	13,497	46,066	50,325	0	827	10,065
66	10,065	34,034	37,262	0	615	7,452
67	7,452	25,083	27,492	0	455	5,498
68	5,498	18,545	20,316	0	336	4,063
69	4,063	13,856	15,140	0	249	3,028
70	3,028	10,551	11,471	0	187	2,294
71	2,294	8,258	8,912	0	143	1,782
72	1,782	6,687	7,152	0	113	1,430
73	1,430	5,621	5,952	0	92	1,190
74	1,190	4,894	5,135	0	78	1,027
75	1,027	4,392	4,573	0	68	915
76	915	4,033	4,174	0	61	835
77	835	3,762	3,877	0	56	775
78	775	3,544	3,643	0	53	729
79	729	3,356	3,446	0	50	689
80	689	3,186	3,268	0	47	654
81	654	3,024	3,102	0	45	620
82	620	2,866	2,941	0	42	588
83	588	2,709	2,781	0	40	556
84	556	2,549	2,619	0	38	524
85	524	2,386	2,454	0	36	491
86	491	2,221	2,288	0	33	458
87	458	2,057	2,122	0	31	424
88	424	1,894	1,956	0	29	391
89	391	1,734	1,793	0	26	359
90	359	1,578	1,634	0	24	327
91	327	1,427	1,480	0	22	296
92	296	1,283	1,332	0	20	266
93	266	1,145	1,191	0	18	238
94	238	1,012	1,055	0	16	211
95	211	883	924	0	14	185
96	185	760	798	0	12	160
97	160	643	678	0	10	136
98	136	535	566	0	9	113
99	113	435	463	0	7	93
100	93	346	370	0	6	74

Single Discount Rate Development

Present Values of Projected OPEB Benefits Beginning July 1, 2019

(Years 1-50)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected 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 All 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	\$ 36,842,621	\$ 48,930,533	\$ 48,930,533	\$ 0	\$ 47,247,768	\$ 0	\$ 47,247,768
2	36,944,597	48,650,600	48,650,600	0	43,801,829	0	43,801,829
3	38,802,461	48,248,049	48,248,049	0	40,502,936	0	40,502,936
4	9,615,226	47,611,631	47,611,631	0	37,266,834	0	37,266,834
5	9,489,491	46,759,773	46,759,773	0	34,125,933	0	34,125,933
6	9,320,663	45,701,399	45,701,399	0	31,098,851	0	31,098,851
7	9,110,560	44,471,592	44,471,592	0	28,216,310	0	28,216,310
8	8,866,176	43,086,471	43,086,471	0	25,489,491	0	25,489,491
9	8,590,711	41,625,174	41,625,174	0	22,960,377	0	22,960,377
10	8,299,988	40,074,455	40,074,455	0	20,610,725	0	20,610,725
11	7,991,393	38,437,169	38,437,169	0	18,432,309	0	18,432,309
12	7,665,470	36,715,999	36,715,999	0	16,416,720	0	16,416,720
13	7,322,705	34,948,592	34,948,592	0	14,570,130	0	14,570,130
14	6,970,633	33,156,913	33,156,913	0	12,888,742	0	12,888,742
15	6,613,674	31,343,533	31,343,533	0	11,360,229	0	11,360,229
16	6,252,366	29,533,669	29,533,669	0	9,980,660	0	9,980,660
17	5,891,757	27,732,848	27,732,848	0	8,738,542	0	8,738,542
18	5,532,974	25,949,098	25,949,098	0	7,623,765	0	7,623,765
19	5,177,648	24,190,210	24,190,210	0	6,626,582	0	6,626,582
20	4,827,360	22,487,924	22,487,924	0	5,743,835	0	5,743,835
21	4,488,440	20,822,646	20,822,646	0	4,958,967	0	4,958,967
22	4,156,851	19,240,994	19,240,994	0	4,272,534	0	4,272,534
23	3,841,836	17,750,991	17,750,991	0	3,675,220	0	3,675,220
24	3,544,991	16,333,323	16,333,323	0	3,153,102	0	3,153,102
25	3,262,438	15,017,344	15,017,344	0	2,703,082	0	2,703,082
26	3,000,063	13,801,588	13,801,588	0	2,316,316	0	2,316,316
27	2,757,586	12,677,756	12,677,756	0	1,983,873	0	1,983,873
28	2,533,369	11,641,296	11,641,296	0	1,698,539	0	1,698,539
29	2,326,527	10,684,179	10,684,179	0	1,453,510	0	1,453,510
30	2,135,468	9,802,211	9,802,211	0	1,243,379	0	1,243,379
31	1,959,369	8,992,535	8,992,535	0	1,063,566	0	1,063,566
32	1,797,670	8,247,523	8,247,523	0	909,512	0	909,512
33	1,648,857	7,561,346	7,561,346	0	777,476	0	777,476
34	1,511,773	6,930,120	6,930,120	0	664,402	0	664,402
35	1,385,646	6,349,328	6,349,328	0	567,572	0	567,572
36	1,269,581	5,814,391	5,814,391	0	484,619	0	484,619
37	1,162,666	5,320,755	5,320,755	0	413,496	0	413,496
38	1,063,994	4,864,048	4,864,048	0	352,451	0	352,451
39	972,696	4,440,325	4,440,325	0	299,998	0	299,998
40	887,984	4,046,068	4,046,068	0	254,882	0	254,882
41	809,156	3,678,299	3,678,299	0	216,051	0	216,051
42	735,620	3,334,554	3,334,554	0	182,621	0	182,621
43	666,884	3,012,855	3,012,855	0	153,848	0	153,848
44	602,554	2,711,675	2,711,675	0	129,109	0	129,109
45	542,324	2,429,897	2,429,897	0	107,872	0	107,872
46	485,973	2,166,735	2,166,735	0	89,687	0	89,687
47	433,343	1,921,646	1,921,646	0	74,165	0	74,165
48	384,327	1,694,251	1,694,251	0	60,969	0	60,969
49	338,849	1,484,253	1,484,253	0	49,801	0	49,801
50	296,850	1,291,374	1,291,374	0	40,400	0	40,400

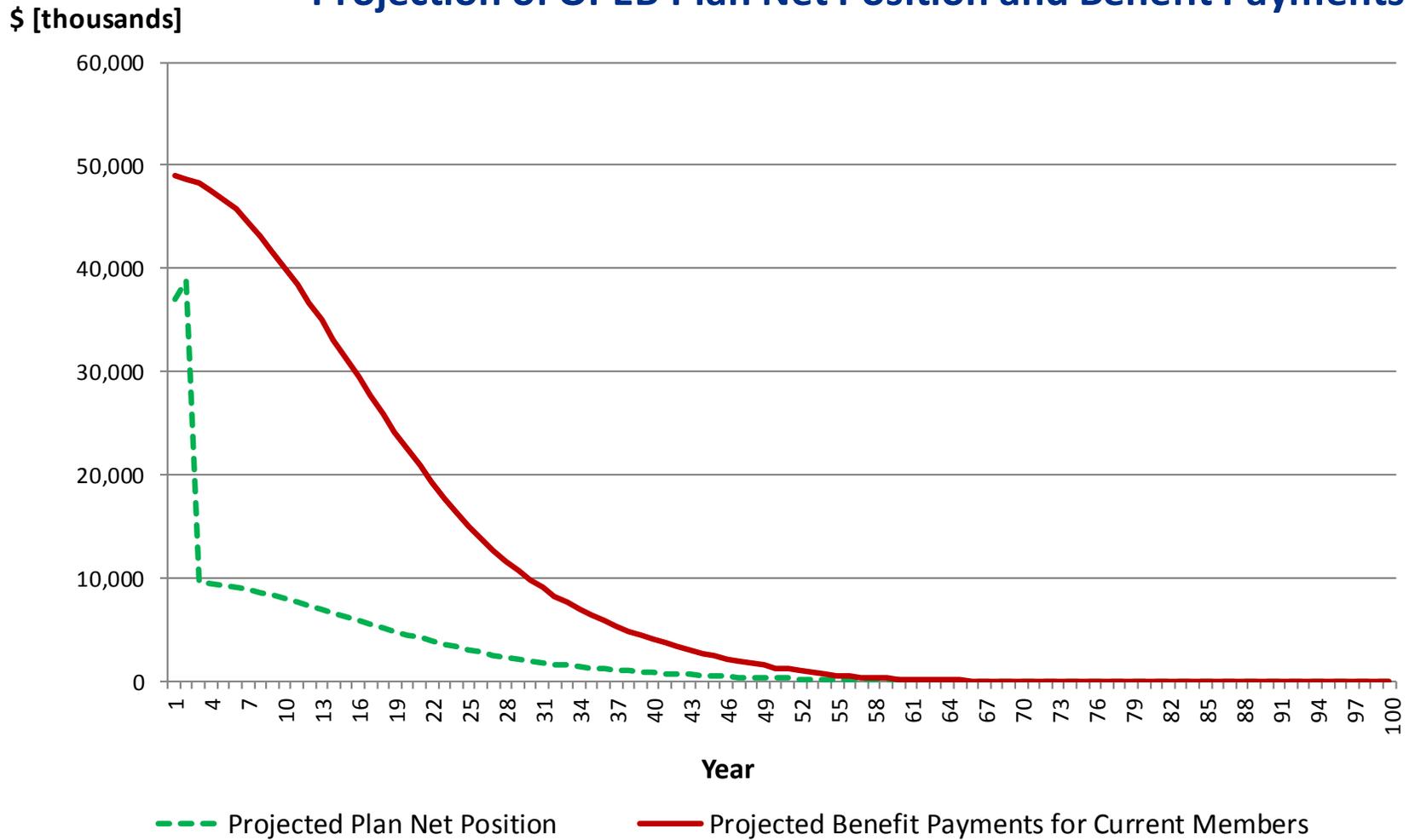
Single Discount Rate Development

Present Values of Projected OPEB Benefits Beginning July 1, 2019

(Years 50-100)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected 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 All 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	\$ 258,275	\$ 1,115,321	\$ 1,115,321	\$ 0	\$ 32,534	\$ 0	\$ 32,534
52	223,064	955,707	955,707	0	25,993	0	25,993
53	191,141	812,064	812,064	0	20,594	0	20,594
54	162,413	683,855	683,855	0	16,170	0	16,170
55	136,771	570,439	570,439	0	12,576	0	12,576
56	114,088	471,072	471,072	0	9,684	0	9,684
57	94,214	384,910	384,910	0	7,378	0	7,378
58	76,982	311,024	311,024	0	5,558	0	5,558
59	62,205	248,421	248,421	0	4,139	0	4,139
60	49,684	196,063	196,063	0	3,046	0	3,046
61	39,213	152,870	152,870	0	2,215	0	2,215
62	30,574	117,752	117,752	0	1,591	0	1,591
63	23,550	89,634	89,634	0	1,129	0	1,129
64	17,927	67,484	67,484	0	792	0	792
65	13,497	50,325	50,325	0	551	0	551
66	10,065	37,262	37,262	0	380	0	380
67	7,452	27,492	27,492	0	262	0	262
68	5,498	20,316	20,316	0	180	0	180
69	4,063	15,140	15,140	0	125	0	125
70	3,028	11,471	11,471	0	89	0	89
71	2,294	8,912	8,912	0	64	0	64
72	1,782	7,152	7,152	0	48	0	48
73	1,430	5,952	5,952	0	37	0	37
74	1,190	5,135	5,135	0	30	0	30
75	1,027	4,573	4,573	0	25	0	25
76	915	4,174	4,174	0	21	0	21
77	835	3,877	3,877	0	18	0	18
78	775	3,643	3,643	0	16	0	16
79	729	3,446	3,446	0	14	0	14
80	689	3,268	3,268	0	13	0	13
81	654	3,102	3,102	0	11	0	11
82	620	2,941	2,941	0	10	0	10
83	588	2,781	2,781	0	9	0	9
84	556	2,619	2,619	0	8	0	8
85	524	2,454	2,454	0	7	0	7
86	491	2,288	2,288	0	6	0	6
87	458	2,122	2,122	0	5	0	5
88	424	1,956	1,956	0	4	0	4
89	391	1,793	1,793	0	4	0	4
90	359	1,634	1,634	0	3	0	3
91	327	1,480	1,480	0	3	0	3
92	296	1,332	1,332	0	2	0	2
93	266	1,191	1,191	0	2	0	2
94	238	1,055	1,055	0	2	0	2
95	211	924	924	0	1	0	1
96	185	798	798	0	1	0	1
97	160	678	678	0	1	0	1
98	136	566	566	0	1	0	1
99	113	463	463	0	0	0	0
100	93	0	0	0	0	0	0
Totals	\$ 478,198,937	\$ 478,198,937	\$ 478,198,937	\$ 0	\$ 478,198,937	\$ 0	\$ 478,198,937

Projection of OPEB Plan Net Position and Benefit Payments



SECTION C

ACTUARIAL SECTION

Summary of Changes from June 30, 2018 to June 30, 2019 (\$ in Millions)

	Pension				
	Employees	Teachers	Police	Fire	Total
Reconciliation of UAAL					
Expected	\$1,562.9	\$2,185.6	\$851.0	\$368.0	\$4,967.5
Impact of (Gain)Loss	42.8	22.6	26.4	(4.6)	87.2
Impact of Method Change	(76.1)	(56.7)	(22.0)	(11.2)	(166.0)
Impact of Plan Change	<u>18.8</u>	<u>26.9</u>	<u>13.1</u>	<u>5.9</u>	<u>64.7</u>
Total	\$1,548.4	\$2,178.4	\$868.5	\$358.1	\$4,953.4
Funded %					
Prior Valuation	65.0 %	59.2 %	67.2 %	69.7 %	63.6 %
Expected Change	1.2 %	1.1 %	1.2 %	1.1 %	1.1 %
Impact of Gain(Loss)	(0.6)%	(0.2)%	(0.7)%	0.3 %	(0.4)%
Impact of Method Change	1.0 %	0.6 %	0.5 %	0.7 %	0.7 %
Impact of Plan Change	<u>(0.2)%</u>	<u>(0.3)%</u>	<u>(0.3)%</u>	<u>(0.4)%</u>	<u>(0.2)%</u>
Total	66.4 %	60.4 %	67.9 %	71.4 %	64.8 %

	Medical Subsidy				
	State Employees	Political Subdivision Employees	Teachers	Police & Fire	Total
Reconciliation of UAAL					
Expected	\$56.8	\$35.9	\$224.3	\$312.8	\$629.8
Impact of (Gain)Loss	(1.1)	(0.8)	1.3	(8.3)	(8.9)
Impact of Method Change	0.0	0.0	0.0	0.0	0.0
Impact of Plan Change	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total	\$55.7	\$35.1	\$225.6	\$304.5	\$620.9

Reconciliation of contribution rates will be provided in the funding report.

The pension funded percent of 64.8% is the ratio of the actuarial value of assets to the actuarial accrued liability for NHRS in total. That ratio is 65.2% based on market value of assets.

The funded percent is appropriate for assessing the need for future contributions, but does not give an indication for the amount of such contributions. The funded percent is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the Plan's benefit obligations.

Development of Actuarial Value of Assets

Year Ended June 30:	2017	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	\$ 7,663,416,136	\$ 8,204,537,196	\$ 8,747,715,939				
B. Market Value End of Year	8,293,261,180	8,874,175,235	9,207,615,151				
C. Market Value Beginning of Year	7,460,944,677	8,293,261,180	8,874,175,235				
D. Non-Investment Net Cash Flow*	(150,426,632)	(139,877,807)	(157,374,111)				
E. Investment Income							
E1. Market Total: B - C - D	982,743,135	720,791,862	490,814,027				
E2. Assumed Rate	7.25%	7.25%	7.25%				
E3. Amount for Immediate Recognition	550,144,704	589,758,376	628,504,594				
E4. Amount for Phased-In Recognition: E1-E3	432,598,431	131,033,486	(137,690,567)				
F. Phased-In Recognition of Investment Income							
F1. Current Year: 0.20 x E4	86,519,686	26,206,697	(27,538,113)				
F2. First Prior Year	(92,471,186)	86,519,686	26,206,697	\$ (27,538,113)			
F3. Second Prior Year	(52,984,178)	(92,471,186)	86,519,686	26,206,697	\$ (27,538,113)		
F4. Third Prior Year	126,027,156	(52,984,178)	(92,471,186)	86,519,686	26,206,697	\$ (27,538,113)	
F5. Fourth Prior Year	74,311,510	126,027,155	(52,984,179)	(92,471,187)	86,519,687	26,206,698	\$ (27,538,115)
F6. Total Recognized Investment Gain	141,402,988	93,298,174	(60,267,095)	(7,282,917)	85,188,271	(1,331,415)	(27,538,115)
G. Preliminary Funding Value End of Year: A + D + E3 + F6	\$ 8,204,537,196	\$ 8,747,715,939	\$ 9,158,579,327				
H. Additional Recognized G/L due to Corridor	-	-	-				
I. Final Funding Value after 20% Corridor	\$ 8,204,537,196	\$ 8,747,715,939	\$ 9,158,579,327				
J. Difference between Market & Funding Value: B-I	\$ 88,723,984	\$ 126,459,296	\$ 49,035,824				
K. Recognized Rate of Return	9.11%	8.40%	6.55%				
L. Market Rate of Return	13.31%	8.77%	5.58%				
M. Ratio of Funding Value to Market Value	98.93%	98.57%	99.47%				

The Funding Value of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. The Funding Value of Assets is unbiased with respect to Market Value. At any time it may be either greater or less than Market Value. If assumed rates are exactly realized for 4 consecutive years, it will become equal to Market Value. Final Funding Value of Assets may not be less than 80% nor more than 120% of Market Value of Assets.

**Information regarding net cash flows for funding purposes is provided separately from the GASB Nos. 67 and 74 information and may differ. Total non-investment net cash flow includes \$3,850 in employer contributions and \$559,534 in administrative expenses that were unallocated in the GASB accounting statements.*

Allocation of Assets

	Employees	Teachers	Police	Fire	Total
Allocated Fund Assets (Actuarial Value)	\$3,080,598,118	\$3,330,307,311	\$1,851,735,492	\$895,938,406	\$9,158,579,327
Less Reserve for TSAs	\$0	\$0	\$0	\$0	\$0
Less 401(h) Account	\$16,630,948	\$4,219,363	\$12,867,729	\$2,928,373	\$36,646,413
Net Pension Valuation Assets	\$3,063,967,170	\$ 3,326,087,948	\$1,838,867,763	\$893,010,033	\$9,121,932,914

The Actuarial Value of Assets was allocated to the pension and medical subsidy plans based on the Market Value of those plans. The Actuarial Value of Assets was then further allocated to each fund (either pension or medical subsidy) based on the Market Value of those funds. The 401(h) account for Police and Fire is combined. The allocation between Police and Fire is based on the percentage of the medical subsidy market value of assets.

Development of Pension Actuarial Liabilities

June 30, 2019

Actuarial Present Value of	Total Present Value (1)	Portion Covered by Future Normal Cost Contributions (2)	Actuarial Accrued Liabilities (1) - (2)
Age and service allowances based on total service likely to be rendered by present active members	\$ 6,395,960,456	\$ 1,194,261,173	\$ 5,201,699,283
Disability benefits likely to be paid to present active members	262,190,624	135,421,846	126,768,778
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	78,789,652	36,618,577	42,171,075
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	1,147,886,058	718,528,632	429,357,426
Benefits likely to be paid to current inactive and vested deferred members	329,629,994	-	329,629,994
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	7,945,717,449	-	7,945,717,449
Total	\$ 16,160,174,233	\$ 2,084,830,228	\$ 14,075,344,005
Actuarial Value of Assets	\$ 9,121,932,914	-	\$ 9,121,932,914
Liabilities to be Covered by Future Contributions	\$ 7,038,241,319	\$ 2,084,830,228	\$ 4,953,411,091
Funded Ratio			64.8%

Actuarial Balance Sheet as of June 30, 2019

Assets and Present Value of Expected Future Contributions

	Pension	Medical Subsidy
A. Present valuation assets		
1. Net assets from system financial statements	\$ 9,170,772,530	\$ 36,842,621
2. Funding value adjustment	(48,839,616)	(196,208)
3. Valuation assets	9,121,932,914	36,646,413
B. Actuarial present value of expected future employer contributions		
1. For normal costs	371,018,001	7,848,302
2. For unfunded actuarial accrued liability	4,953,411,091	620,951,031
3. Total	5,324,429,092	628,799,333
C. Actuarial present value of expected future member contributions	1,713,812,227	-
D. Total Present and Expected Future Resources	\$ 16,160,174,233	\$ 665,445,746

Present Value of Expected Future Benefit Payments

	Pension	Medical Subsidy
A. To retirees and beneficiaries	\$ 7,945,717,449	\$ 558,945,039
B. To vested terminated members	234,946,322	-
C. To non-vested terminated members (outstanding refunds)	94,683,672	-
D. To present active members		
1. Allocated to service rendered prior to valuation date - actuarial accrued liability	5,799,996,562	98,652,405
2. Allocated to service likely to be rendered after valuation date	2,084,830,228	7,848,302
3. Total	7,884,826,790	106,500,707
E. Total Actuarial Present Value of Expected Future Benefit Payments	\$ 16,160,174,233	\$ 665,445,746

Experience Gain/(Loss) -- June 30, 2019

	Pension	Medical Subsidy
(1) Actual UAAL* as of June 30, 2017	\$ 5,042,765,222	\$ 657,695,295
(2) Normal cost from 2017 valuation	279,372,304	2,311,860
(3) Actual contributions (employer and employee)	640,229,409	44,194,281
(4) Interest accrual: $[(1)+1/2 [(2)-(3)]] \times \{.0725 \text{ for pension};$.0325 for medical subsidy}	352,519,409	20,694,508
(5) Expected UAAL end of year: (1)+(2)-(3)+(4)	5,034,427,526	636,507,382
(6) Change from legislation	-	-
(7) Change from revised actuarial assumptions	-	-
(8) Expected UAAL after changes: (5)+(6)+(7)	5,034,427,526	636,507,382
(9) Actual UAAL* as of June 30, 2018	4,992,209,359	652,800,203
(10) Gain/(loss) for year: (8)-(9)	42,218,167	(16,292,821)
(11) Gain/(loss) as percent of actuarial accrued liabilities at start of year	0.3 %	(2.3)%
(12) Normal cost from 2018 valuation	285,306,615	2,046,540
(13) Actual contributions (employer and employee)	658,398,461	45,509,112
(14) Interest accrual: $[(9)+1/2 [(12)-(13)]] \times \{.0725 \text{ for pension};$.0325 for medical subsidy}	348,410,599	20,509,740
(15) Expected UAAL end of year: (9)+(12)-(13)+(14)	4,967,528,112	629,847,371
(16) Change from legislation	64,666,472	-
(17) Change from revised actuarial methodology	(166,032,902)	-
(18) Expected UAAL after changes: (15)+(16)+(17)	4,866,161,682	629,847,371
(19) Actual UAAL as of June 30, 2019	4,953,411,091	620,951,031
(20) Gain/(loss) for year: (18)-(19)	(87,249,409)	8,896,340
(21) Gain/(loss) as percent of actuarial accrued liabilities at start of year	(0.6)%	1.3 %

* *Unfunded Actuarial Accrued Liabilities.*

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures are discussed in the following pages. A historical summary of these plan maturity measures can be found on page 44.

Funded Ratio

The ratio of actuarial value of assets to actuarial accrued liabilities is expected to trend toward 100% by June 30, 2041. Each subsequent change in liability as calculated in odd-numbered years shall be separately amortized over a fixed period of no longer than 20 years.

Ratio of Actual Total Payroll to Expected Total Payroll

This ratio is expected to remain near 100% each year.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Unfunded Actuarial Accrued Liability to Payroll

The ratio of the unfunded actuarial accrued liability to payroll is expected to trend toward 0% by June 30, 2041.

Ratio of Actuarial Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the actuarial value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Plan Maturity Measures (Concluded)

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time. Total AAL / Total Payroll is expected to grow as the System matures. The rate of growth may slow down as members hired on or after July 1, 2011 replace current members.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

Standard Deviation of Investment Return to Payroll

This measure illustrates the impact of a one standard deviation change in investment return as a percent of payroll. Investment return experience other than expected ultimately affects the employer contribution rates. The higher the ratio of this risk metric, the greater the expected volatility in employer contribution rates. Absent changes in investment policy, this metric is expected to increase as the assets grow to 100% of the AAL.

Standard Deviation of Contribution Rate

This measure illustrates the impact of a one standard deviation change in investment return on the annual contribution rate. Absent a change in amortization policy, this rate is expected to increase substantially as the amortization period decreases.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

Summary of Risk Measures Pension

Valuation Year	Funded Ratio				Actual Total Payroll / Expected Total Payroll	Net Cash Flow as a Percent of MVA	Ratio of Actives to Retirees ¹	Initial UAAL Amortization Period	Ratio to Payroll				
	Percentage of AAL Covered by Net Funding Value of Assets Available								UAAL	AVA	AAL	Standard Deviation of Investment Return	Standard Deviation of Contribution Rate
	NHRS in Total	Aggregate Member Contributions	Current Retirees & Beneficiaries	Active & Inactive Members									
June 30, 2008	67.8%	100%	83%	0%	101%	(1.2)%	2.2	30	109%	230%	339%	***	***
June 30, 2009*	58.3	100	63	0	103	(2.3)	2.1	30	145	202	346	23%	0.3%
June 30, 2010	58.5	100	61	0	98	(2.8)	2.0	30	150	211	361	23	0.3%
June 30, 2011#*	57.4	100	63	0	98	(3.1)	1.8	29	169	228	397	26	0.3%
June 30, 2012	56.1	100	58	0	96	(2.3)	1.7	28	183	234	417	28	0.3%
June 30, 2013	56.7	100	59	0	97	(2.9)	1.6	27	185	243	428	29	0.3%
June 30, 2014	60.7	100	67	0	97	(1.7)	1.6	26	173	267	440	32	0.4%
June 30, 2015#^	59.2	100	66	0	99	(1.8)	1.5	25	195	283	478	33	0.4%
June 30, 2016	60.0	100	67	0	98	(1.7)	1.5	24	196	294	489	34	0.4%
June 30, 2017#	61.8	100	72	0	99	(2.0)	1.3	23	189	306	495	36	0.5%
June 30, 2018	63.6	100	75	0	100	(1.7)	1.3	22	181	317	498	37	0.5%
June 30, 2019* @	64.8	100	77	0	100	(1.8)	1.3	21	175	323	498	39	0.5%

After reflection of changes in assumptions.

* After reflection of changes in legislation.

@ After reflection of changes in methodology.

*** Unavailable.

^ The standard deviation of investment return as of June 30, 2015 was updated in the 7/1/2010-6/30/2015 experience study.

¹ Beginning with the valuation year ended June 30, 2019, the ratio of actives to retirees excludes additional data records which have resulted from additional annuities, survivor benefits, or members having benefits in more than one valuation group. There were 2,371 such records in 2019).

These risk measures are provided in accordance with the System's Actuarial Funding Policy. Short term fluctuations will occur due to experience, plan changes, and assumption and method changes. Long term expectations are described on the prior pages.

UAAL Amortization Period: The unfunded liability as of June 30, 2017 shall be amortized through 2039 (a 20-year period beginning on July 1, 2019). Each subsequent change in liability as calculated in odd-numbered years shall be separately amortized over a fixed period of no longer than 20 years.

Pension Solvency Test

The New Hampshire Retirement System funding objective is to meet long-term benefit promises through contributions that remain approximately level from year-to-year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will pay all promised benefits when due -- the ultimate test of financial soundness.

A solvency test is one means of checking a system's progress under its funding program. In a solvency test, the plan's present assets (cash and investments) are compared with:

- 1) Active member contributions on deposit;
- 2) The liabilities for future benefits to present retired lives;
- 3) The liabilities for service already rendered by active and inactive members.

In a System that has been following the discipline of level percent-of-payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the System.

Total of all Groups (\$ in Thousands)

Fiscal Year	Projected Pension Liabilities for				Net Assets Available for Benefits	Percentage of Accrued Liabilities Covered by Net Assets Available		
	(1) Aggregate Member Contributions	(2) Current Retirees & Beneficiaries	(3) Active & Inactive Members (Employer Financed Portion)			(1)	(2)	(3)
2010	\$2,553,612	\$4,378,205	\$2,022,115		\$5,233,838	100%	61%	0%
2011	#* 2,631,430	4,959,865	2,406,956		5,740,516	100%	63%	0%
2012	2,773,081	5,246,672	2,341,847		5,817,882	100%	58%	0%
2013	2,808,526	5,519,814	2,380,428		6,070,681	100%	59%	0%
2014	2,842,340	5,789,052	2,413,782		6,700,553	100%	67%	0%
2015	# 2,949,169	6,565,522	2,788,945		7,280,761	100%	66%	0%
2016	2,978,817	6,964,227	2,789,822		7,636,066	100%	67%	0%
2017	# 2,915,811	7,315,440	2,977,198		8,165,684	100%	72%	0%
2018	2,927,793	7,667,448	3,107,908		8,710,939	100%	75%	0%
2019	*@ 3,019,358	7,945,717	3,110,269		9,121,933	100%	77%	0%

After reflection of changes in assumptions.

* After reflection of changes in legislation.

@ After reflection of changes in methodology.

Pension Solvency Test -- Comparative Statement

(\$ in Thousands)

Group	Fiscal Year	Projected Pension Liabilities for				Net Assets Available for Benefits	Percentage of Accrued Liabilities Covered by Net Assets Available		
		(1)	(2)	(3)	(1)		(2)	(3)	
		Aggregate Member Contributions	Current Retirees & Beneficiaries	Active & Inactive Members (Employer Financed Portion)					
Employees	2010	\$ 955,735	\$ 1,344,902	\$ 680,958	\$ 1,721,002	100%	57%	0%	
Teachers	2010	998,775	1,770,635	783,710	2,049,650	100%	59%	0%	
Police	2010	397,440	851,136	386,621	997,325	100%	70%	0%	
Fire	2010	201,661	411,532	170,827	465,861	100%	64%	0%	
Employees	2011	** 995,389	1,548,109	810,983	1,834,609	100%	54%	0%	
Teachers	2011	** 1,041,699	1,893,862	973,407	2,153,182	100%	59%	0%	
Police	2011	** 396,344	1,030,900	432,256	1,179,798	100%	76%	0%	
Fire	2011	** 197,998	486,994	190,310	572,927	100%	77%	0%	
Employees	2012	1,052,106	1,641,026	756,255	1,877,395	100%	50%	0%	
Teachers	2012	1,101,262	1,999,152	949,670	2,173,315	100%	54%	0%	
Police	2012	411,672	1,092,005	432,116	1,189,308	100%	71%	0%	
Fire	2012	208,041	514,489	203,805	577,864	100%	72%	0%	
Employees	2013	1,069,628	1,729,855	755,482	1,977,479	100%	52%	0%	
Teachers	2013	1,107,192	2,087,926	977,937	2,255,011	100%	55%	0%	
Police	2013	417,630	1,160,173	438,580	1,236,579	100%	71%	0%	
Fire	2013	214,076	541,860	208,430	601,612	100%	72%	0%	
Employees	2014	1,083,878	1,823,517	784,437	2,195,284	100%	61%	0%	
Teachers	2014	1,113,650	2,198,892	966,511	2,482,496	100%	62%	0%	
Police	2014	422,972	1,209,741	454,133	1,361,280	100%	78%	0%	
Fire	2014	221,840	556,902	208,701	661,493	100%	79%	0%	
Employees	2015	# 1,137,601	2,007,299	863,247	2,403,294	100%	63%	0%	
Teachers	2015	# 1,155,922	2,555,611	1,141,245	2,682,083	100%	60%	0%	
Police	2015	# 433,215	1,364,908	543,229	1,477,517	100%	77%	0%	
Fire	2015	# 222,431	637,704	241,223	717,867	100%	78%	0%	
Employees	2016	1,152,928	2,139,549	857,347	2,538,563	100%	65%	0%	
Teachers	2016	1,171,831	2,692,037	1,156,821	2,799,863	100%	60%	0%	
Police	2016	430,490	1,460,840	535,225	1,546,665	100%	76%	0%	
Fire	2016	223,568	671,801	240,428	750,975	100%	79%	0%	
Employees	2017	1,133,071	2,272,436	934,564	2,734,558	100%	70%	0%	
Teachers	2017	# 1,132,876	2,819,228	1,211,560	2,979,005	100%	65%	0%	
Police	2017	426,606	1,526,761	570,755	1,650,908	100%	80%	0%	
Fire	2017	223,258	697,015	260,320	801,214	100%	83%	0%	
Employees	2018	1,128,180	2,391,404	974,131	2,922,358	100%	75%	0%	
Teachers	2018	1,142,455	2,956,675	1,268,903	3,176,932	100%	69%	0%	
Police	2018	428,859	1,596,512	591,281	1,758,301	100%	83%	0%	
Fire	2018	228,299	722,857	273,593	853,348	100%	86%	0%	
Employees	2019	*@ 1,160,917	2,468,647	982,771	3,063,967	100%	77%	0%	
Teachers	2019	*@ 1,181,186	3,059,089	1,264,212	3,326,088	100%	70%	0%	
Police	2019	*@ 441,940	1,672,002	593,433	1,838,868	100%	84%	0%	
Fire	2019	*@ 235,315	745,979	269,853	893,010	100%	88%	0%	

After reflection of changes in assumptions.

* After reflection of changes in legislation.

@ After reflection of changes in methodology.

Development of Pension Actuarial Liabilities

June 30, 2019

Employees

Actuarial Present Value of	Total Present Value (1)	Portion Covered by Future Normal Cost Contributions (2)	Actuarial Accrued Liabilities (1) - (2)
Age and service allowances based on total service likely to be rendered by present active members	\$ 2,160,195,560	\$ 354,441,660	\$ 1,805,753,900
Disability benefits likely to be paid to present active members	84,632,847	50,254,864	34,377,983
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	38,312,637	17,128,156	21,184,481
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	410,948,568	280,993,951	129,954,617
Benefits likely to be paid to current inactive and vested deferred members	152,417,765	-	152,417,765
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	2,468,646,995	-	2,468,646,995
Total	\$ 5,315,154,372	\$ 702,818,631	\$ 4,612,335,741
Actuarial Value of Assets	\$ 3,063,967,170	-	\$ 3,063,967,170
Liabilities to be Covered by Future Contributions	\$ 2,251,187,202	\$ 702,818,631	\$ 1,548,368,571
Funded Ratio			66.4%

Development of Pension Actuarial Liabilities

June 30, 2019

Teachers

Actuarial Present Value of	Total Present Value (1)	Portion Covered by Future Normal Cost Contributions (2)	Actuarial Accrued Liabilities (1) - (2)
Age and service allowances based on total service likely to be rendered by present active members	\$ 2,567,115,207	\$ 467,655,700	\$ 2,099,459,507
Disability benefits likely to be paid to present active members	58,559,816	25,985,625	32,574,191
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	23,499,665	10,257,691	13,241,974
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	450,695,315	285,213,806	165,481,509
Benefits likely to be paid to current inactive and vested deferred members	134,639,964	-	134,639,964
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	3,059,089,445	-	3,059,089,445
Total	\$ 6,293,599,412	\$ 789,112,822	\$ 5,504,486,590
Actuarial Value of Assets	\$ 3,326,087,948	\$ -	\$ 3,326,087,948
Liabilities to be Covered by Future Contributions	\$ 2,967,511,464	\$ 789,112,822	\$ 2,178,398,642
Funded Ratio			60.4%

Development of Pension Actuarial Liabilities

June 30, 2019

Police

Actuarial Present Value of	Total Present Value (1)	Portion Covered by Future Normal Cost Contributions (2)	Actuarial Accrued Liabilities (1) - (2)
Age and service allowances based on total service likely to be rendered by present active members	\$ 1,076,320,138	\$ 223,631,314	\$ 852,688,824
Disability benefits likely to be paid to present active members	81,811,489	39,868,219	41,943,270
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	10,559,012	5,859,494	4,699,518
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	222,882,766	121,733,040	101,149,726
Benefits likely to be paid to current inactive and vested deferred members	34,891,442	-	34,891,442
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	1,672,002,020	-	1,672,002,020
Total	\$ 3,098,466,867	\$ 391,092,067	\$ 2,707,374,800
Actuarial Value of Assets	\$ 1,838,867,763	-	\$ 1,838,867,763
Liabilities to be Covered by Future Contributions	\$ 1,259,599,104	\$ 391,092,067	\$ 868,507,037
Funded Ratio			67.9%

Development of Pension Actuarial Liabilities

June 30, 2019

Fire

Actuarial Present Value of	Total Present Value (1)	Portion Covered by Future Normal Cost Contributions (2)	Actuarial Accrued Liabilities (1) - (2)
Age and service allowances based on total service likely to be rendered by present active members	\$ 592,329,551	\$ 148,532,499	\$ 443,797,052
Disability benefits likely to be paid to present active members	37,186,472	19,313,138	17,873,334
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	6,418,338	3,373,236	3,045,102
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	63,359,409	30,587,835	32,771,574
Benefits likely to be paid to current inactive and vested deferred members	7,680,823	-	7,680,823
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	745,978,989	-	745,978,989
Total	\$ 1,452,953,582	\$ 201,806,708	\$ 1,251,146,874
Actuarial Value of Assets	\$ 893,010,033	-	\$ 893,010,033
Liabilities to be Covered by Future Contributions	\$ 559,943,549	\$ 201,806,708	\$ 358,136,841
Funded Ratio			71.4%

OPEB Solvency Test

The New Hampshire Retirement System funding objective is to contribute the minimum amount necessary to maintain assets sufficient to pay medical subsidy benefits in each of the four subaccounts. Given the absence of assets from prior pre-funding (as exists for pension benefits), medical subsidy benefits payable in the future will be largely funded by future employer contributions. If the contributions to the System are soundly executed, the System will pay all promised benefits when due -- the ultimate test of financial soundness.

A solvency test is one means of checking a system's progress under its funding program. In a solvency test, the plan's present assets (cash and investments) are compared with:

- 1) The liabilities for future benefits to present retired lives;
- 2) The liabilities for service already rendered by active and inactive members.

Total of all Groups (\$ in Thousands)

Fiscal Year	Projected OPEB Liabilities for			Net Assets Available for Benefits	Percentage of Accrued Liabilities Covered by Net Assets Available	
	(1) Current Retirees & Beneficiaries	(2) Active & Inactive Members (Employer Financed Portion)			(1)	(2)
2015 #	\$ 610,819	\$ 150,523		\$ 19,515	3%	0%
2016	591,335	138,797		27,350	5%	0%
2017 #	568,676	127,872		38,853	7%	0%
2018	576,261	113,316		36,777	6%	0%
2019	558,945	98,652		36,646	7%	0%

After reflection of changes in assumptions.

Valuation Methods

Pension

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 gain/(losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

Financing of Unfunded Actuarial Accrued Liabilities - Unfunded Actuarial Accrued Liabilities are amortized by level (principal & interest combined) percent-of-payroll contributions from the contribution effective date. The unfunded liability as of June 30, 2017 shall be amortized through 2039. Each subsequent change in liability as calculated in odd-numbered years shall be separately amortized over a fixed period of no longer than 20 years.

The rate-setting valuations project the unfunded actuarial accrued liability to the beginning of the applicable biennium to determine the unfunded amortization rate. We projected the normal cost rates from the first year of the rate setting biennium to better reflect the impact of the changing benefit tiers and generational mortality. We developed projected normal cost rates based on a new entrant profile determined by the current active population with 3-8 years of service.

Medical Subsidy

Liabilities are determined under the entry-age actuarial cost method.

Under New Hampshire Statute, contribution rates to the 401(h) sub-trust are determined as the lesser of 25% of the employers' total contributions or the actuarial required contribution rate that keeps the medical subsidy sub-trust solvent (the "solvency rate"). Under IRS Regulations, 401(h) sub-trust contributions are limited by 25% of the total contributions to the plan (other than contributions to fund past service credits). NHRS maintains the historical information for determining compliance with IRC Section 401(h). A test for compliance with IRC Section 401(h) was outside the scope of this valuation.

At the November 12, 2013 Board meeting, the Board elected to incorporate a 20% margin requirement from the end of the first year of the biennium and every year thereafter.

Valuation Methods

Actuarial Value of Assets - The Actuarial Value of Assets recognizes assumed investment return fully each year. Differences between actual return on the Market Value of assets and assumed return on the Actuarial Value of Assets are phased-in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, Actuarial Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Actuarial Value of Assets will tend to be greater than Market Value. The Actuarial Value of Assets is unbiased with respect to Market Value. At any time it may be either greater or less than Market Value. If assumed rates are exactly realized for 4 consecutive years, it will become equal to Market Value. Actuarial Value is limited to a 20% corridor around the Market Value.

The Actuarial Value of Assets was allocated to the pension and medical subsidy plans based on the Market Value of those plans. The Actuarial Value of Assets was then further allocated to each fund (either pension or medical subsidy) based on the Market Value of those funds.

For purposes of determining the medical subsidy solvency rates, the Market Value of Assets was used for all group funds due to the short time horizon before these closed group funds are expected to become pay-as-you-go.

Development of Amortization Payment

The employer contribution rates determined by the 2019 valuation are for the 2022-2023 biennium. The Unfunded Actuarial Accrued Liability (UAAL) was determined using the Actuarial Value of assets and actuarial accrued liability calculated as of the valuation date. The UAAL amortization payment (one component of the contribution requirement), is the level percent of pay required to fully amortize the UAAL over multiple periods beginning on July 1, 2019. This UAAL payment reflects any payments expected to be made and interest to be accrued between the valuation date and the date contributions determined by this report are scheduled to begin. It was assumed that the entire pension contribution as determined by the June 30, 2017 valuation effective from July 1, 2019 to June 30, 2021 would be contributed to the net pension assets. The unfunded liability as of June 30, 2017 shall be amortized through 2039. Each subsequent change in liability as calculated in odd-numbered years shall be separately amortized over a fixed period of no longer than 20 years.

Valuation Assumptions

The actuarial assumptions used in the valuation are shown in this section. All actuarial assumptions and the rationale for the assumptions are based on the July 1, 2010 to June 30, 2015 experience study.

All actuarial assumptions are expectations of future experience, not market measures. Under RSA 100-A:14 IX, the Board of Trustees sets the actuarial assumptions after consulting with the actuary.

Economic Assumptions

The investment return rate assumed in the valuations is 7.25% per year, compounded annually (net after investment expenses). **The investment return rate** assumed in the medical subsidy valuations is 3.25% per year, compounded annually (net after investment expenses) for purposes of computing accrued liabilities. However, for determining the solvency contribution rate for the medical subsidy account and GASB 74, the investment return rate assumption was 7.25% on the market value of assets.

The **Wage Inflation Rate** assumed in this valuation was 3.25% per year. The wage inflation rate is defined to be the portion of total pay increases for an individual that are due to macroeconomic forces including productivity, price inflation, and labor market conditions. The wage inflation rate does not include pay changes related to individual merit and seniority effects.

The **Price Inflation** assumption is 2.50% per year.

The assumed **Real Rate of Return** over wage inflation is defined to be the portion of total investment return that is more than the assumed total wage growth rate. Considering other economic assumptions, the 7.25% investment return rate translates to an assumed real rate of return over wage inflation of 4.00%. The assumed real rate of return over price inflation would be higher – at 4.75%, with a 2.50% price inflation assumption.

The active member population for Employees, Police and Fire is assumed to remain constant. For purposes of financing the unfunded liabilities, total payroll is assumed to grow at the wage inflation rate – 3.25% per year. For Teachers, the active member population is assumed to decline by 0.50% per year. For purposes of financing the unfunded liabilities, total payroll for Teachers is assumed to grow at the wage inflation rate minus 0.50% which is 2.75% per year.

Pay increase assumptions for individual active members are shown for sample ages on the following pages. Part of the assumption for each age is for merit and/or seniority increase, and the other 3.25% recognizes wage inflation, including price inflation, productivity increases, and other macroeconomic forces.

Valuation Assumptions

Employees

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

Salary Increase Assumptions for an Individual Member			
Service Index	Merit & Seniority	Base (Economy)	Increase Next Year
1	10.00%	3.25%	13.25%
2	6.00%	3.25%	9.25%
3	2.50%	3.25%	5.75%
4	2.00%	3.25%	5.25%
5	1.50%	3.25%	4.75%
6	1.25%	3.25%	4.50%
7	1.00%	3.25%	4.25%
8	1.00%	3.25%	4.25%
9	1.00%	3.25%	4.25%
10	0.50%	3.25%	3.75%
11	0.50%	3.25%	3.75%
12	0.50%	3.25%	3.75%
13	0.50%	3.25%	3.75%
14	0.50%	3.25%	3.75%
15	0.50%	3.25%	3.75%
16	0.50%	3.25%	3.75%
17	0.50%	3.25%	3.75%
18	0.50%	3.25%	3.75%
19	0.50%	3.25%	3.75%
20	0.50%	3.25%	3.75%
21	0.50%	3.25%	3.75%
22	0.50%	3.25%	3.75%
23	0.50%	3.25%	3.75%
24	0.50%	3.25%	3.75%
25	0.50%	3.25%	3.75%
Ref:	662 - -3.25%		

Valuation Assumptions

Employees (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

For Members Hired Prior to July 1, 2011

Retirement Ages	% of Active Members Retiring within Next Year					
	Male			Female		
	Normal	Early	Early Rule X	Normal	Early	Early Rule X
45			1.00%			1.00%
46			1.00%			1.00%
47			1.00%			1.25%
48			1.00%			1.25%
49			1.00%			1.00%
50		0.75%	1.75%		0.75%	2.20%
51		0.75%	2.50%		0.75%	2.50%
52		0.75%	3.10%		0.75%	2.50%
53		0.75%	3.50%		0.75%	3.50%
54		0.75%	3.75%		1.25%	4.00%
55		1.50%	6.00%		1.75%	8.00%
56		2.20%	9.00%		2.75%	6.00%
57		2.20%	11.00%		2.50%	12.00%
58		3.00%	11.50%		3.25%	12.00%
59		4.50%	18.00%		5.00%	13.00%
60	11.00%			11.00%		
61	11.00%			11.00%		
62	16.00%			15.00%		
63	16.00%			14.00%		
64	14.00%			14.00%		
65	16.00%			20.00%		
66	25.00%			22.00%		
67	23.00%			22.00%		
68	21.00%			18.00%		
69	20.00%			19.00%		
70	100.00%			100.00%		
Ref.	2552	2554	2556	2553	2555	2557

Valuation Assumptions

Employees (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

For Members Hired on or After July 1, 2011

Retirement Ages	% of Active Members Retiring within Next Year			
	Male		Female	
	Normal	Early	Normal	Early
60		11%		11%
61		11%		11%
62		16%		15%
63		16%		14%
64		14%		14%
65	45%		44%	
66	45%		44%	
67	23%		22%	
68	21%		18%	
69	20%		19%	
70	100%		100%	
Ref.	999	2552	999	2553
	65	60	65	60

Valuation Assumptions

Employees (Concluded)

Rates of separation from active membership were as shown below (rates do not apply to members eligible for normal retirement and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	% of Active Members Separating within Next Year	
		Male	Female
	0	23.00%	30.00%
	1	20.00%	22.00%
	2	15.00%	16.00%
	3	12.00%	12.00%
	4	10.00%	8.00%
25	5+	7.20%	7.20%
30		7.20%	7.20%
35		5.04%	5.04%
40		5.04%	5.04%
45		5.04%	5.04%
50		3.96%	3.96%
55		3.60%	3.60%
60		3.60%	3.60%
Ref.		256	256
		1.8	1.8
		59	36

Rates of disability among active members. 60% are assumed to be ordinary disability and 40% are assumed to be accidental disability.

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Men	Women
20	0.03%	0.00%
25	0.03%	0.02%
30	0.03%	0.02%
35	0.03%	0.03%
40	0.08%	0.06%
45	0.16%	0.11%
50	0.27%	0.23%
55	0.47%	0.42%
Ref	7	19
	1.40	0.90

Valuation Assumptions

Teachers

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

Salary Increase Assumptions for an Individual Member			
Service Index	Merit & Seniority	Base (Economy)	Increase Next Year
1	10.00%	3.25%	13.25%
2	6.00%	3.25%	9.25%
3	3.25%	3.25%	6.50%
4	2.75%	3.25%	6.00%
5	2.50%	3.25%	5.75%
6	2.25%	3.25%	5.50%
7	2.00%	3.25%	5.25%
8	1.75%	3.25%	5.00%
9	1.50%	3.25%	4.75%
10	1.25%	3.25%	4.50%
11	1.00%	3.25%	4.25%
12	1.00%	3.25%	4.25%
13	1.00%	3.25%	4.25%
14	1.00%	3.25%	4.25%
15	1.00%	3.25%	4.25%
16	1.00%	3.25%	4.25%
17	1.00%	3.25%	4.25%
18	1.00%	3.25%	4.25%
19	1.00%	3.25%	4.25%
20	1.00%	3.25%	4.25%
21	1.00%	3.25%	4.25%
22	1.00%	3.25%	4.25%
23	1.00%	3.25%	4.25%
24	1.00%	3.25%	4.25%
25	1.00%	3.25%	4.25%
Ref:	663 - -3.25%		

The Teachers' active head count is assumed to decline 0.50% per year. The open group payroll growth assumption is consequently 2.75% per year (3.25% - 0.50%).

Valuation Assumptions

Teachers (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

For Members Hired Prior to July 1, 2011

Retirement Ages	% of Active Members Retiring within Next Year					
	Male			Female		
	Normal	Early	Early Rule X	Normal	Early	Early Rule X
45			1.00%			1.00%
46			1.00%			1.00%
47			1.00%			1.00%
48			1.00%			1.00%
49			1.00%			1.00%
50		1.00%	1.00%		0.50%	1.00%
51		1.00%	1.00%		0.50%	1.00%
52		1.00%	1.50%		0.50%	1.00%
53		1.00%	2.00%		0.50%	1.00%
54		1.00%	2.00%		1.00%	2.00%
55		1.00%	3.00%		1.50%	5.00%
56		3.50%	7.00%		2.50%	8.00%
57		2.00%	11.00%		3.75%	11.00%
58		8.50%	15.00%		4.50%	14.00%
59		6.00%	19.00%		9.00%	17.00%
60	18.00%			13.00%		
61	19.00%			15.00%		
62	20.00%			19.00%		
63	21.00%			19.00%		
64	22.00%			21.00%		
65	23.00%			25.00%		
66	30.00%			32.00%		
67	25.00%			27.00%		
68	25.00%			27.00%		
69	25.00%			27.00%		
70	100.00%			100.00%		
Ref.	2558	1925	2561	2559	2560	2562

Valuation Assumptions

Teachers (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

For Members Hired on or After July 1, 2011

Retirement Ages	% of Active Members Retiring within Next Year			
	Male		Female	
	Normal	Early	Normal	Early
60		18%		13%
61		19%		15%
62		20%		19%
63		21%		19%
64		22%		21%
65	58%		56%	
66	58%		56%	
67	25%		27%	
68	25%		27%	
69	25%		27%	
70	100%		100%	
Ref.	999	2558	999	2559
	65	60	65	60

Valuation Assumptions

Teachers (Concluded)

Rates of separation from active membership were as shown below (rates do not apply to members eligible for normal retirement and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	% of Active Members Separating within Next Year	
		Male	Female
	0	35.0%	31.0%
	1	17.0%	16.0%
	2	14.0%	13.0%
	3	10.0%	11.0%
	4	8.0%	8.0%
25	5+	4.0%	6.0%
30		4.0%	6.0%
35		2.8%	4.2%
40		2.8%	4.2%
45		2.8%	4.2%
50		2.2%	3.3%
55		2.0%	3.0%
60		2.0%	3.0%
Ref.		256	256
		1.00	1.50
		184	996

Rates of disability among active members. 67% percent are assumed to be ordinary disability and 33% percent are assumed to be accidental disability.

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Male	Female
20	0.01%	0.00%
25	0.01%	0.00%
30	0.02%	0.00%
35	0.02%	0.01%
40	0.04%	0.04%
45	0.07%	0.06%
50	0.17%	0.11%
55	0.38%	0.35%
Ref	2	66
	0.25	0.75

Valuation Assumptions

Police

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

Salary Increase Assumptions for an Individual Member			
Service Index	Merit & Seniority	Base (Economy)	Increase Next Year
1	22.00%	3.25%	25.25%
2	15.00%	3.25%	18.25%
3	7.00%	3.25%	10.25%
4	5.00%	3.25%	8.25%
5	3.75%	3.25%	7.00%
6	2.50%	3.25%	5.75%
7	2.00%	3.25%	5.25%
8	1.50%	3.25%	4.75%
9	1.00%	3.25%	4.25%
10	1.00%	3.25%	4.25%
11	1.00%	3.25%	4.25%
12	1.00%	3.25%	4.25%
13	1.00%	3.25%	4.25%
14	1.00%	3.25%	4.25%
15	1.00%	3.25%	4.25%
16	1.00%	3.25%	4.25%
17	1.00%	3.25%	4.25%
18	1.00%	3.25%	4.25%
19	1.00%	3.25%	4.25%
20	1.00%	3.25%	4.25%
21	1.00%	3.25%	4.25%
22	1.00%	3.25%	4.25%
23	1.00%	3.25%	4.25%
24	1.00%	3.25%	4.25%
25	1.00%	3.25%	4.25%
Ref:	665 - -3.25%		

Valuation Assumptions

Police (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

(Applying to Eligible Members)

For Members Hired Prior to July 1, 2011 Who Have Vested Status as of January 1, 2012		For Members Hired on or After July 1, 2011 and for Members Hired Prior to July 1, 2011 Who Have Non-Vested Status as of January 1, 2012				
Retirement Ages	% of Active Members Retiring within Next Year	Age 46 with 21 Years	Age 47 with 22 Years	Age 48 with 23 Years	Age 49 with 24 Years	Age 50 with 25 Years
45	22%					
46	22%	27%				
47	22%	27%	31%			
48	22%	25%	31%	34%		
49	22%	25%	31%	34%	38%	
50	22%	25%	27%	34%	38%	40%
51	22%	22%	27%	31%	38%	40%
52	22%	22%	22%	31%	33%	40%
53	22%	22%	22%	22%	33%	38%
54	22%	22%	22%	22%	22%	38%
55	22%	22%	22%	22%	22%	22%
56	22%	22%	22%	22%	22%	22%
57	22%	22%	22%	22%	22%	22%
58	22%	22%	22%	22%	22%	22%
59	22%	22%	22%	22%	22%	22%
60	22%	22%	22%	22%	22%	22%
61	20%	20%	20%	20%	20%	20%
62	22%	22%	22%	22%	22%	22%
63	22%	22%	22%	22%	22%	22%
64	20%	20%	20%	20%	20%	20%
65	25%	25%	25%	25%	25%	25%
66	50%	50%	50%	50%	50%	50%
67	50%	50%	50%	50%	50%	50%
68	50%	50%	50%	50%	50%	50%
69	50%	50%	50%	50%	50%	50%
70	100%	100%	100%	100%	100%	100%
Ref.	2563 45					

Valuation Assumptions

Police (Concluded)

Rates of separation from active membership were as shown below (rates do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	% of Active Members Separating within Next Year	
		Male	Female
	0	25.00%	30.00%
	1	15.00%	20.00%
	2	10.00%	13.00%
	3	7.00%	11.50%
	4	5.00%	10.00%
25	5+	5.88%	5.88%
30		4.93%	4.93%
35		4.13%	4.13%
40		3.45%	3.45%
45		2.83%	2.83%
50		2.40%	2.40%
55		1.98%	1.98%
60		1.60%	1.60%
Ref.		40	40
		0.5	0.5
		16	1008

Rates of disability among active members.

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Ordinary	Accidental
20	0.03%	0.03%
25	0.03%	0.03%
30	0.03%	0.03%
35	0.07%	0.07%
40	0.16%	0.16%
45	0.28%	0.28%
50	0.45%	0.45%
55	0.67%	0.67%
Ref.	35	35
	0.40	0.40

Valuation Assumptions

Fire

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

Salary Increase Assumptions for an Individual Member			
Service Index	Merit & Seniority	Base (Economy)	Increase Next Year
1	22.00%	3.25%	25.25%
2	15.00%	3.25%	18.25%
3	7.00%	3.25%	10.25%
4	5.00%	3.25%	8.25%
5	3.75%	3.25%	7.00%
6	2.50%	3.25%	5.75%
7	2.00%	3.25%	5.25%
8	1.50%	3.25%	4.75%
9	1.00%	3.25%	4.25%
10	1.00%	3.25%	4.25%
11	1.00%	3.25%	4.25%
12	1.00%	3.25%	4.25%
13	1.00%	3.25%	4.25%
14	1.00%	3.25%	4.25%
15	1.00%	3.25%	4.25%
16	1.00%	3.25%	4.25%
17	1.00%	3.25%	4.25%
18	1.00%	3.25%	4.25%
19	1.00%	3.25%	4.25%
20	1.00%	3.25%	4.25%
21	1.00%	3.25%	4.25%
22	1.00%	3.25%	4.25%
23	1.00%	3.25%	4.25%
24	1.00%	3.25%	4.25%
25	1.00%	3.25%	4.25%
Ref:	665 - -3.25%		

Valuation Assumptions

Fire (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

(Applying to Eligible Members)

For Members Hired Prior to July 1, 2011 Who Have Vested Status as of January 1, 2012		For Members Hired on or After July 1, 2011 and for Members Hired Prior to July 1, 2011 Who Have Non-Vested Status as of January 1, 2012				
Retirement Ages	% of Active Members Retiring within Next Year	Age 46 with 21 Years	Age 47 with 22 Years	Age 48 with 23 Years	Age 49 with 24 Years	Age 50 with 25 Years
45	12%					
46	12%	15%				
47	12%	15%	18%			
48	12%	15%	18%	22%		
49	12%	15%	18%	22%	26%	
50	17%	15%	18%	21%	26%	30%
51	17%	17%	18%	21%	26%	30%
52	17%	17%	17%	21%	21%	30%
53	17%	17%	17%	17%	21%	22%
54	17%	17%	17%	17%	17%	22%
55	22%	22%	22%	22%	22%	22%
56	22%	22%	22%	22%	22%	22%
57	22%	22%	22%	22%	22%	22%
58	22%	22%	22%	22%	22%	22%
59	22%	22%	22%	22%	22%	22%
60	28%	28%	28%	28%	28%	28%
61	28%	28%	28%	28%	28%	28%
62	28%	28%	28%	28%	28%	28%
63	28%	28%	28%	28%	28%	28%
64	28%	28%	28%	28%	28%	28%
65	28%	28%	28%	28%	28%	28%
66	28%	28%	28%	28%	28%	28%
67	28%	28%	28%	28%	28%	28%
68	28%	28%	28%	28%	28%	28%
69	28%	28%	28%	28%	28%	28%
70	100%	100%	100%	100%	100%	100%
Ref.	2564					
	45					

Valuation Assumptions

Fire (Concluded)

Rates of separation from active membership were as shown below (rates do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	% of Active Members Separating within Next Year		
		Male	Female	
	0	7.75%	7.75%	
	1	4.50%	4.50%	
	2	3.00%	3.00%	
	3	2.75%	2.75%	
	4	2.25%	2.25%	
25	5 & Over	1.25%	1.25%	
30		1.25%	1.25%	
35		1.25%	1.25%	
40		1.25%	1.25%	
45		1.25%	1.25%	
50		1.25%	1.25%	
55		1.25%	1.25%	
60		1.25%	1.25%	
Ref.			151	151
			1.25	1.25
		1007	1007	

Rates of disability among active members.

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Ordinary	Accidental
20	0.04%	0.04%
25	0.06%	0.06%
30	0.07%	0.07%
35	0.09%	0.09%
40	0.12%	0.12%
45	0.18%	0.18%
50	0.27%	0.27%
55	0.40%	0.40%
Ref	3	3
	0.35	0.35

Valuation Assumptions

Healthy Mortality

The standard mortality table for death after retirement is the RP-2014 Healthy Annuitant generational mortality tables for males and females with credibility adjustments and adjusted for fully generational mortality improvements using Scale MP-2015.

This assumption is used to measure the probabilities of each benefit payment being made after retirement.

Employees

Sample Attained Ages	Probability of Dying Next Year*		Future Life Expectancy (years)*			
	Men	Women	Men	Women		
35	0.125%	0.131%	49.07	50.95		
40	0.184%	0.188%	43.85	45.81		
45	0.270%	0.235%	38.75	40.76		
50	0.413%	0.312%	33.80	35.77		
55	0.619%	0.446%	29.06	30.90		
60	0.869%	0.643%	24.56	26.20		
65	1.222%	0.955%	20.25	21.69		
70	1.856%	1.514%	16.18	17.42		
75	3.012%	2.501%	12.45	13.50		
80	5.084%	4.267%	9.17	10.02		
Ref:	2135	x	1.16	2136	x	1.24

Teachers

Sample Attained Ages	Probability of Dying Next Year*		Future Life Expectancy (years)*			
	Men	Women	Men	Women		
35	0.107%	0.092%	50.72	54.75		
40	0.158%	0.132%	45.48	49.54		
45	0.233%	0.165%	40.34	44.39		
50	0.356%	0.219%	35.33	39.30		
55	0.533%	0.313%	30.52	34.31		
60	0.749%	0.451%	25.92	29.44		
65	1.054%	0.670%	21.51	24.74		
70	1.600%	1.062%	17.33	20.24		
75	2.597%	1.755%	13.47	16.04		
80	4.383%	2.994%	10.05	12.26		
Ref:	2135	x	1.00	2136	x	0.87

* Applicable to calendar year 2019. Rates and life expectancy in future years are determined by the MP-2015 projection scale. The rates shown include the credibility adjustment for each member classification.

Valuation Assumptions

Police

Sample Attained	Probability of Dying Next Year*		Future Life Expectancy (years)*			
	Ages	Men	Women	Men	Women	
35		0.106%	0.112%	50.83	52.64	
40		0.157%	0.160%	45.59	47.46	
45		0.231%	0.201%	40.44	42.36	
50		0.352%	0.267%	35.44	37.33	
55		0.528%	0.381%	30.62	32.40	
60		0.741%	0.549%	26.02	27.62	
65		1.043%	0.816%	21.60	23.01	
70		1.584%	1.294%	17.41	18.64	
75		2.571%	2.138%	13.54	14.59	
80		4.339%	3.648%	10.11	10.98	
Ref:	2135	x	0.99	2136	x	1.06

Fire

Sample Attained	Probability of Dying Next Year*		Future Life Expectancy (years)*			
	Ages	Men	Women	Men	Women	
35		0.107%	0.107%	50.72	53.15	
40		0.158%	0.153%	45.48	47.97	
45		0.233%	0.191%	40.34	42.86	
50		0.356%	0.254%	35.33	37.81	
55		0.533%	0.363%	30.52	32.86	
60		0.749%	0.524%	25.92	28.06	
65		1.054%	0.778%	21.51	23.43	
70		1.600%	1.233%	17.33	19.03	
75		2.597%	2.037%	13.47	14.94	
80		4.383%	3.476%	10.05	11.28	
Ref:	2135	x	1.00	2136	x	1.01

* Applicable to calendar year 2019. Rates and life expectancy in future years are determined by the MP-2015 projection scale. The rates shown include the credibility adjustment for each member classification.

Valuation Assumptions

Disabled Mortality

Disabled pension mortality was based on the RP-2014 Disabled Retiree generational mortality tables for males and females with credibility adjustments and adjusted for fully generational mortality improvements using Scale MP-2015. The probabilities of disabled mortality at sample attained ages were as follows:

<u>Employees</u>		
Sample Ages	Probability of Occurrence Next Year*	
	Disabled Death	
	Men	Women
20	0.042%	0.020%
25	0.187%	0.097%
30	0.480%	0.270%
35	0.882%	0.548%
40	1.281%	0.811%
45	1.654%	1.022%
50	2.070%	1.344%
55	2.521%	1.783%
Ref	2137	2138
	1.16	1.24

<u>Teachers</u>		
Sample Ages	Probability of Occurrence Next Year*	
	Disabled Death	
	Men	Women
20	0.036%	0.014%
25	0.161%	0.068%
30	0.414%	0.190%
35	0.760%	0.384%
40	1.104%	0.569%
45	1.426%	0.717%
50	1.785%	0.943%
55	2.173%	1.251%
Ref	2137	2138
	1.00	0.87

* Applicable to calendar year 2019. Rates and life expectancy in future years are determined by the MP-2015 projection scale. The rates shown include the credibility adjustment for each member classification.

Valuation Assumptions

Police

Sample Ages	<u>Probability of Occurrence Next Year*</u>	
	<u>Disabled Death</u>	
	Men	Women
20	0.036%	0.017%
25	0.160%	0.083%
30	0.410%	0.231%
35	0.753%	0.468%
40	1.093%	0.693%
45	1.412%	0.874%
50	1.767%	1.149%
55	2.151%	1.524%
Ref	2137	2138
	0.99	1.06

Fire

Sample Ages	<u>Probability of Occurrence Next Year*</u>	
	<u>Disabled Death</u>	
	Men	Women
20	0.036%	0.016%
25	0.161%	0.079%
30	0.414%	0.220%
35	0.760%	0.446%
40	1.104%	0.660%
45	1.426%	0.833%
50	1.785%	1.095%
55	2.173%	1.452%
Ref	2137	2138
	1.00	1.01

* Applicable to calendar year 2019. Rates and life expectancy in future years are determined by the MP-2015 projection scale. The rates shown include the credibility adjustment for each member classification.

Valuation Assumptions

Pre-Retirement Mortality

For active members dying before retirement, the mortality tables are based on the RP-2014 Employee generational mortality tables for males and females with credibility adjustments and adjusted for fully generational mortality improvements using Scale MP-2015. The probabilities of dying prior to retirement at sample attained ages were as follows:

Employees

Sample Ages	Probability of Occurrence Next Year*					
	Death Before Retirement					
	Men			Women		
20			0.035%			0.016%
25			0.044%			0.016%
30			0.044%			0.026%
35			0.054%			0.037%
40			0.063%			0.049%
45			0.096%			0.073%
50			0.171%			0.124%
55			0.301%			0.206%
Ref	2133	x	1.16	2134	x	1.24

Teachers

Sample Ages	Probability of Occurrence Next Year*					
	Death Before Retirement					
	Men			Women		
20			0.031%			0.011%
25			0.038%			0.011%
30			0.038%			0.018%
35			0.046%			0.026%
40			0.055%			0.034%
45			0.083%			0.051%
50			0.148%			0.087%
55			0.259%			0.145%
Ref	2133	x	1.00	2134	x	0.87

* Applicable to calendar year 2019. Rates and life expectancy in future years are determined by the MP-2015 projection scale. The rates shown include the credibility adjustment for each member classification.

Valuation Assumptions

Police

Sample Ages	Probability of Occurrence Next Year*					
	Death Before Retirement					
	Men		Women			
20		0.030%		0.014%		
25		0.038%		0.014%		
30		0.038%		0.022%		
35		0.046%		0.032%		
40		0.054%		0.042%		
45		0.082%		0.062%		
50		0.146%		0.106%		
55		0.257%		0.176%		
Ref	2133	x	0.99	2134	x	1.06

Fire

Sample Ages	Probability of Occurrence Next Year*					
	Death Before Retirement					
	Men		Women			
20		0.031%		0.013%		
25		0.038%		0.013%		
30		0.038%		0.021%		
35		0.046%		0.030%		
40		0.055%		0.040%		
45		0.083%		0.060%		
50		0.148%		0.101%		
55		0.259%		0.168%		
Ref	2133	x	1.00	2134	x	1.01

* Applicable to calendar year 2019. Rates and life expectancy in future years are determined by the MP-2015 projection scale. The rates shown include the credibility adjustment for each member classification.

Weighting of Mortality

The weighting of ordinary and accidental deaths by member classification is as follows:

	Employees	Teachers	Police	Fire
Ordinary	98%	98%	50%	50%
Accidental	2%	2%	50%	50%

Miscellaneous and Technical Assumptions

<i>Administrative & Investment Expenses</i>	The investment return assumption is intended to be the return net of investment expenses. Assumed administrative expenses are added to the Normal Cost, and were 0.35% of payroll.
<i>Benefit Service</i>	Exact Fractional service is used to determine the amount of benefit payable.
<i>COLA</i>	None assumed.
<i>Decrement Operation</i>	Disability and turnover decrements do not operate during normal retirement eligibility for Group I members. They do operate for early retirement for Group I members and during normal retirement for Group II members.
<i>Decrement Timing</i>	Normal and early retirement decrements for the Teachers group are assumed to occur at the beginning of the year. All other decrements for all groups were assumed to occur mid-year.
<i>Eligibility Testing</i>	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.
<i>Forfeitures</i>	It is assumed that 25% of members who quit before retirement with 10-15 years of service will elect to refund and forfeit their pension.
<i>Incidence of Contributions</i>	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.
<i>Liability Adjustments</i>	Normal, early and vesting retirement liabilities are increased by 7.5%, 5.0%, 11.5% and 11.5% for Employees, Teachers, Police and Fire respectively to account for end of career pay increases. Members hired after July 1, 2011 or who have non-vested status as of January 1, 2012 are assumed to have no adjustment for end of career payments.

Marriage Assumption

Group I: 60% of males and 60% of females are assumed to be married for purposes of death-in-service benefits. Group II: 60% of males and 60% of females are assumed to be married for purposes of death-in-service and death after retirement benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.

Normal Form of Benefit

This valuation assumes that members will elect the normal form of payment. Alternate forms of payment are available and are actuarially adjusted based on the valuation interest and mortality.

Group I: The assumed normal form of benefit is a straight life benefit.

Group II: The assumed normal form of benefit is straight life for single members and joint and 50% survivor for married members.

Option Factors

Annuity values and factors are based on a 7.25% interest rate and the RP-2014 Healthy Annuitant mortality tables for males and females, adjusted for improvements using Scale MP-2015. While the tables used in the valuations are based on generational mortality, a static model with five years of projection was used for purposes of determining the option factors.

Unisex mortality was used based on active male/female blends observed in the June 30, 2015 valuation of 39%/61%, 22%/78%, 87%/13% and 97%/3% for Employees, Teachers, Police and Fire, respectively.

Disabled mortality is based on the RP-2014 Disabled Retiree mortality table using a static model with five years of mortality improvement projection.

For the Group I Straight Life factors, the current practice of not reflecting the changing benefit at age 65 is in the factor.

Each option factor is determined on an actuarial equivalent basis.

Pay Increase Timing

Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

New Entrant Profile

For purposes of projecting the normal cost to the beginning of the rate setting biennium, the new entrant profile is based on actual members with 3-8 years of service on the valuation date.

Service Credit Accruals It is assumed that members accrue one year of service credit per year.

Service Purchases One month of service was added to the reported service for all active participants in consideration of potential subsidized service purchases in the future.

Split Benefits Active members with service in more than one plan are valued as if all service accrued is in their current plan. Split benefits are valued upon retirement, as reported in the data.

Data Adjustments

Active Data

- New active member pays were annualized.
- 84 active records were excluded due to reported pays being \$0.
- 5 active records were excluded due to reported employment service being less than 0.
- 2 active members and 4 deferred members who were reported as being vested as of 12/31/2011 were also reported as being hired on or after 7/1/2011. For the purposes of retirement eligibility it was assumed these members were not hired on or after 7/1/2011.

Retiree Data

- 914 payee records were excluded due to non-blank Benefit Termination Dates.

Medical Subsidy Data

- 371 records were excluded due to non-blank Benefit Termination Dates.
- 4 records were excluded due to having an 'F' in the field 'Medical Subsidy Eligible'.

Medical Subsidy

Actual medical subsidy recipients are included in the valuation plus 25% of those who opted-out. For those members reported as eligible in the future but not currently receiving, we assumed that members would commence benefits at age eligibility.

The solvency rates for the medical subsidy benefits were determined to provide an estimated margin of 20% of the benefits by the end of the first year of the biennium and thereafter. The 20% margin is intended to mitigate the risk of insolvency due to adverse experience.

A retired member's medical subsidy amount is provided by System staff. If the member is under the age of 65, the pre-65 subsidy amount used is the amount reported by System staff, and the post-65 subsidy amount is assumed to be at the post-65 rates.

It is assumed that 80% of active married members will have their spouses continue to receive a medical subsidy under the plan.

IRC Section 415(b) and 401(a)(17)

For purposes of the valuation, the limitations under IRC Section 401(a)(17) and 415(b) were not reflected due to immateriality.

Plan Provisions – Group I

Statute	Amended and Restated under New Hampshire Revised Statutes Annotated (RSA) Chapter 100-A. Most recently amended under legislation passed in the year ending June 30, 2011.
Effective Date	July 1, 1967
Plan Year	July 1 through June 30
Type of Plan	Qualified, governmental defined benefit retirement plan; it is a single plan for financial reporting purposes.
Eligibility Requirements	Any employee or teacher becomes a Group I member as a condition of employment. Membership is optional for elected officials, officials appointed for fixed terms, unclassified state employees or employees of the general court.
Creditable Service	Service measured from date of employment to date of retirement or prior termination plus service credited under one or more of the predecessor systems.
Earnable Compensation	<p>For members who have attained vested status prior to January 1, 2012, full base rate of compensation paid plus any overtime pay, holiday and vacation pay, sick pay, longevity or severance pay, cost of living bonus, additional pay for extracurricular and instructional activities or any military differential pay, plus the fair market value of non-cash compensation such as meals or living quarters if subject to federal income tax. Earnable compensation in the final 12 months prior to termination shall be limited to 1 ½ times the higher of the earnable compensation in the 12 month period preceding the final 12 months or the highest compensation year excluding the final 12 months. Earnable compensation is subject to IRC section 401(a)(17) limits. Compensation for extra and special duty, as determined by the employer, shall be included but limited during the highest 3 years of creditable service as provided in paragraph RSA 100-A:1 XVIII as amended.</p> <p>For members who have not attained vested status prior to January 1, 2012, full base rate of compensation paid plus any overtime pay, longevity pay, cost of living bonus, additional pay for extracurricular and instructional activities, and any military differential pay, plus the fair market value of non-cash compensation such as meals or living quarters if subject to federal income tax, but excluding other compensation except supplemental pay paid by the employer while the member is receiving workers' compensation and teacher development pay that is not part of the contracted annual salary. Earnable compensation is subject to IRC section 401(a)(17) limits. Compensation for extra and special duty, as determined by the employer, shall be included but limited during the highest 5 years of creditable service as provided in paragraph RSA 100-A:1 XVIII as amended. Compensation for extra and special duty shall be eliminated for members who commence service on or after July 1, 2011. Earnable compensation shall not include incentives to encourage</p>

Plan Provisions – Group I

members to retire, severance pay, or end-of-career longevity payments and pay for unused sick or vacation time. Earnable compensation in the final 12 months prior to termination shall be limited to 1 ½ times the higher of the earnable compensation in the 12 month period preceding the final 12 months or the highest compensation year excluding the final 12 months.

The new definition of earnable compensation is applicable January 1, 2012 for members who have not attained vested status prior to January 1, 2012 and immediately for members who commence service on or after July 1, 2011.

Average Final Compensation

For members who have attained vested status prior to January 1, 2012 – Average annual earnable compensation during the highest 3 years of creditable service.

For members who commence service on or after July 1, 2011 or who have not attained vested status prior to January 1, 2012 – Average annual earnable compensation during the highest 5 years of creditable service.

Service Retirement

Eligibility: Age 60 years (Age 65 for members who commence service on or after July 1, 2011).

Benefit: A member annuity that is the actuarial equivalent of the member's accumulated contributions plus a state annuity.

Prior to age 65, the state annuity, together with the member annuity, shall be equal to 1/60th of AFC times creditable service (1/66th of AFC times creditable service for members who commence service on or after July 1, 2011).

After age 65, the state annuity, together with the member annuity, shall be equal to 1/66th of AFC times creditable service.

Normal Form: Straight life annuity.

Early Retirement

Eligibility: Completion of 20 years of creditable service and age plus service at least 70, or attainment of age 50. (Age 60 with 30 years of creditable service for members who commence service on or after July 1, 2011.)

Benefit: Service Retirement Benefit accrued to date of retirement, reduced for each month prior to age 60 by 1/8 of 1% if the member has 35 years or more of creditable service, by 1/4 of 1% if the member has 30 years but less than 35, by 1/3 of 1% if the member has at least 25 years but not 30, by 5/12 of 1% if the member has at least 20 years but not 25, and by 5/9 of 1% if the member has less than 20 years of creditable service

For members who commence service on or after July 1, 2011, normal retirement benefit is reduced 1/4 of 1% for each month prior to age 65.

Plan Provisions – Group I

Ordinary Disability	<p>Eligibility: 10 or more years of creditable service.</p> <p>Benefit: If age 60 or older, the Service Retirement Benefit at attained normal retirement eligibility age as calculated under benefit provisions for members hired prior to July 1, 2011. Under age 60, a member annuity plus state annuity that shall be equal to 1.5% times AFC times years of creditable service. The disability retirement allowance shall not be less than 25% of AFC.</p>
Accidental Disability	<p>Eligibility: Permanently disabled in the performance of duty.</p> <p>Benefit: Service Retirement Benefit if at least age 60, not less than 50% of AFC. Under age 60, a member annuity plus state annuity that shall be equal to 50% times AFC.</p>
Accidental Death Benefits	<p>Eligibility: Accidental death in the performance of duty.</p> <p>Benefit: 50% times AFC.</p>
Ordinary Death Benefits	<p>Eligibility: Death other than accidental death.</p> <p>Benefit: If 10 years creditable service or eligible for service retirement, surviving spouse receives 50% of the service retirement benefit until death or remarriage. If no surviving spouse, designated beneficiary receives a lump sum equal to the greater of \$3,600 or the member's annual compensation.</p> <p>If less than 10 years creditable service and not eligible for service retirement, the member's spouse or designated beneficiary receives a lump sum equal to the greater of \$3,600 or the member's annual compensation.</p>
Post Retirement Death	<p>Not applicable.</p>
Optional Forms	<p>Each of the following options shall be of equivalent actuarial value to the allowance payable in the absence of election of an option.</p> <p>Option 1. Full cash refund. Option 2. 100% Joint and Survivor. Option 3. 50% Joint and Survivor. Option 4. Other Joint and Survivor.</p>
Vested Termination	<p>If a member terminates with less than 10 years of service, the member's accumulated contributions are refunded. If a member terminates with 10 or more years of service, the member either receives a service retirement benefit beginning at any age after age 60 (age 65 for members who commence service on or after July 1, 2011) or a reduced early service retirement benefit beginning at any age after age 50 (age 60 for members who commence service on or after July 1, 2011 and have at least 30 years of creditable service) or the member may apply for a refund of the member's accumulated contributions.</p>

Plan Provisions – Group I

Maximum Benefit

For members who commenced service prior to July 1, 2009 or have attained vested status prior to January 1, 2012, a member's retirement benefit shall not exceed 100% of the member's highest year of earnable compensation. For members who commenced service on or after July 1, 2009 and have not attained vested status prior to January 1, 2012, a member's retirement benefit shall not exceed the lesser of 85% of the member's highest average final compensation or \$120,000.

Refunds

1. Termination for reasons other than retirement or death and the member has not elected a vested deferred retirement benefit.
2. Upon death in service other than accidental death described above, the member's accumulated contributions are payable to the beneficiary or estate if, at the time of death, the member is not eligible for a service retirement.
3. Upon death prior to age 60 of a member electing vested deferred retirement, the member's accumulated contributions at the time of death are payable to the beneficiary or estate.
4. Upon death of a retired member prior to electing an optional allowance, any excess of the member's accumulated contributions at retirement over the sum of retirement allowance payments received.

Member Contributions

7.0% of earnable compensation. Interest on member contributions shall be 2 percentage points less than either the most recent board of trustees approved assumed rate of return determined under RSA 100-A:16, II(g) or the actual rate of return, whichever is lower.

Employer Contributions

As prescribed in RSA 100-A:16.

Temporary Supplemental Allowances

All System members who retired on or before July 1, 2014, or any beneficiaries of such members receiving a survivorship pension benefit shall receive a one-time 1.5% COLA on the first \$50,000 of an annual pension benefit. The COLA will take effect on the retired member's first anniversary date of retirement occurring after July 1, 2020. The adjustment shall become a permanent addition to the member's base retirement allowance.

Other Ancillary Benefits

There are no ancillary benefits - retirement type benefits not required by statutes but which might be deemed a liability if continued beyond the availability of funding by the current funding source.

Plan Provisions – Group II

Statute	Amended and Restated under New Hampshire Revised Statutes Annotated (RSA) Chapter 100-A. Most recently amended under legislation passed in the year ending June 30, 2011.
Effective Date	July 1, 1967
Plan Year	July 1 through June 30
Type of Plan	Qualified, governmental defined benefit retirement plan; it is a single plan for financial reporting purposes.
Eligibility Requirements	Any permanent policeman or permanent fireman becomes a Group II member as a condition of employment.
Creditable Service	Service measured from date of employment to date of retirement or prior termination plus service credited under one or more of the predecessor systems.
Earnable Compensation	<p>For members who have attained vested status prior to January 1, 2012, full base rate of compensation paid plus any overtime pay, holiday and vacation pay, sick pay, longevity or severance pay, cost of living bonus, additional pay for extracurricular and instructional activities or for other extra or special duty, and other compensation paid to the member by the employer, plus the fair market value of non-cash compensation such as meals or living quarters if subject to federal income tax. Earnable compensation in the final 12 months prior to termination shall be limited to 1 ½ times the higher of the earnable compensation in the 12 month period preceding the final 12 months or the highest compensation year excluding the final 12 months. Earnable compensation is subject to IRC section 401(a)(17) limits. Compensation for extra and special duty, as determined by the employer, shall be included but limited during the highest 3 years of creditable service as provided in paragraph RSA 100-A:1 XVIII as amended.</p> <p>For members who have not attained vested status prior to January 1, 2012, full base rate of compensation paid plus any overtime pay, longevity pay, cost of living bonus, additional pay for extracurricular and instructional activities, and any military differential pay, plus the fair market value of non-cash compensation such as meals or living quarters if subject to federal income tax, but excluding other compensation except supplemental pay paid by the employer while the member is receiving workers' compensation and teacher development pay that is not part of the contracted annual salary. Earnable compensation is subject to IRC section 401(a)(17) limits. Compensation for extra and special duty, as determined by the employer, shall be included but limited during the highest 5 years of creditable service as provided in paragraph RSA 100-A:1 XVIII as amended. Compensation for extra and special duty shall be eliminated for members who commence service on or after July 1, 2011.</p>

Plan Provisions – Group II

Earnable compensation shall not include incentives to encourage members to retire, severance pay, or end-of-career longevity payments and pay for unused sick or vacation time. Earnable compensation in the final 12 months prior to termination shall be limited to 1 ½ times the higher of the earnable compensation in the 12 month period preceding the final 12 months or the highest compensation year excluding the final 12 months.

The new definition of earnable compensation is applicable January 1, 2012 for members who have not attained vested status prior to January 1, 2012 and immediately for members who commence service on or after July 1, 2011.

Average Final Compensation

For members who have attained vested status prior to January 1, 2012 – Average annual earnable compensation during the highest 3 years of creditable service.

For members who commence service on or after July 1, 2011 or who have not attained vested status prior to January 1, 2012 – Average annual earnable compensation during the highest 5 years of creditable service.

Service Retirement

Eligibility: Age 45 and 20 years of creditable service or age 60 (age 50 with 25 years of creditable service or age 60 for members who commence service on or after July 1, 2011).

Benefit: A member annuity that is the actuarial equivalent of the member's accumulated contributions plus a state annuity.

The state annuity, together with the member annuity, shall be equal to 2-1/2% of AFC times creditable service up to 40 years (2% of AFC times creditable service up to 42.5 years for members who commence service on or after July 1, 2011. However, a member who commenced service on or after July 1, 2011 shall not receive a service retirement allowance until attaining the age of 52.5, but may receive a reduced allowance after age 50 if the member has at least 25 years of creditable service where the allowance shall be reduced, for each month by which the benefit commencement date precedes the month after which the member attains 52.5 years of age, by ¼ of 1%).

Members hired prior to July 1, 2011 who have not attained vested status prior to January 1, 2012 shall be subject to transition provisions for years of service required for regular service retirement, the minimum age for regular service retirement, and the multiplier used to calculate the retirement annuity, which shall be applicable on January 1, 2012. The state annuity, together with the member annuity, shall be equal to the multiplier times AFC times creditable service up to 40.5 years. The transition provisions are provided in the following table.

Plan Provisions – Group II

Creditable Service on January 1, 2012	Minimum Years of	Minimum Age Attained	Annuity Multiplier
(1) Less than 4 years	24 Years	Age 49	2.1%
(2) At least 4 years but less than 6 years	23 Years	Age 48	2.2%
(3) At least 6 years but less than 8 years	22 Years	Age 47	2.3%
(4) At least 8 years but less than 10 years	21 Years	Age 46	2.4%

Members who have attained vested status prior to January 1, 2012 who have attained the age of 45 with at least 20 years of creditable service, members who commenced service on or after July 1, 2011 who have attained the age of 50 with at least 25 years of creditable service, and members hired prior to July 1, 2011 who have not attained vested status prior to January 1, 2012 who qualify as provided in the transition provisions shall receive a minimum annual service retirement allowance of \$10,000.

Normal Form: straight life annuity (with surviving spouse's benefit payable as described under post-retirement death benefit).

Ordinary Disability

Eligibility: 10 or more years of creditable service.

Benefit: Service Retirement Benefit. The disability retirement allowance shall not be less than 25% of the member's final compensation at the date of the member's disability.

Accidental Disability

Eligibility: Permanently disabled in the performance of duty.

Benefit: Members who have attained vested status prior to January 1, 2012 are eligible for an accidental disability benefit and shall receive a benefit equal to 2/3 of AFC. If a member has more than 26-2/3 years of service, the member will receive a supplemental disability benefit equal to 2-1/2% of AFC times years of creditable service in excess of 26-2/3 years but not in excess of 40 years.

Members hired prior to July 1, 2011 who have not attained vested status prior to January 1, 2012 are eligible for an accidental disability benefit and shall receive a benefit equal to 2/3 of AFC. The calculation of the supplemental allowance shall be as provided in the transition provisions with the number of years for the supplement adjusted proportionally.

Members who commence service on or after July 1, 2011 are eligible for an accidental disability benefit and shall receive a benefit equal to 2/3 of AFC. If a member has more than 33-1/3 years of service, the member will receive a supplemental disability benefit equal to 2% of AFC times years of creditable service in excess of 33-1/3 years but not in excess of 42.5 years.

Plan Provisions – Group II

Accidental Death Benefits

Eligibility: Accidental death in the performance of duty.

Benefit: 50% times the member's annual rate of earnable compensation at the date of the member's death.

Post Retirement Death

Retired prior to April 1, 1987, benefit payable to surviving spouse until death or remarriage equal to 50% of the member's service (if the member had at least 20 years of creditable service), ordinary disability or accidental disability retirement allowance. Upon the death of a member receiving a service or ordinary disability retirement, a lump sum of \$3,600 is payable also.

Retired on or after April 1, 1987, benefit payable to surviving spouse until death or remarriage equal to 50% of the member's service, ordinary disability or accidental disability retirement allowance plus a lump sum as defined below.

Retired on or after April 1, 1987, but before July 1, 1988, hired before July 1, 1988, lump sum of \$3,600.

Retired on or after July 1, 1988, hired before July 1, 1988, lump sum of \$10,000.

Retired on or after July 1, 1988, hired on or after July 1, 1988 but before July 1, 1993, lump sum of \$3,600.

Optional Forms

Each of the following options shall be of equivalent actuarial value to the straight life allowance payable in the absence of election of an option.

- Option 1. Full cash refund.
- Option 2. 100% Joint and Survivor.
- Option 3. 50% Joint and Survivor.
- Option 4. Other Joint and Survivor.

Vested Termination

If a member terminates with less than 10 years of service, the member's accumulated contributions are refunded. If a member terminates with 10 or more years of service, the member either receives his service retirement at the age the member would have attained service or reduced early service retirement eligibility requirement, or age 60 or the member may apply for a refund of accumulated contributions.

Plan Provisions – Group II

Maximum Benefit

For members who commenced service prior to July 1, 2009 or have attained vested status prior to January 1, 2012, a member's retirement benefit shall not exceed 100% of the member's highest year of earnable compensation. For members who commenced service on or after July 1, 2009 and have not attained vested status prior to January 1, 2012, a member's retirement benefit shall not exceed the lesser of 85% of the member's highest average final compensation or \$120,000.

Refunds

1. Termination for reasons other than retirement or death and the member has not elected a vested deferred retirement benefit.
2. Upon death in service other than accidental death described above, the member's accumulated contributions are payable to the beneficiary or estate, if at the time of death, the member is not eligible for a service retirement.
3. Upon death prior to commencement of benefits of a member electing vested deferred retirement, the member's accumulated contributions are payable to the beneficiary or estate at the time of death.
4. Upon death of a survivor of a member retired on accidental disability with spouse receiving accidental disability survivor benefits, the excess of the member's accumulated contributions at retirement over the sum of payments received.
5. Upon death of a retired member prior to electing an optional allowance, any excess of the member's accumulated contributions at retirement over the sum of retirement allowance payments received.

Member Contributions

Fire members: 11.80% of earnable compensation.
Police members: 11.55% of earnable compensation.

Member contributions cease for members who have attained vested status prior to January 1, 2012 with creditable service in excess of 40 years. Member contributions cease for all other Group II members with creditable service in excess of 42.5 years.

Interest on member contributions shall be 2 percentage points less than either the most recent board of trustees approved assumed rate of return determined under RSA 100-A:16, II(g) or the actual rate of return, whichever is lower.

Employer Contributions

As prescribed in RSA 100-A:16.

Temporary Supplemental Allowances

All System members who retired on or before July 1, 2014, or any beneficiaries of such members receiving a survivorship pension benefit shall receive a one-time 1.5% COLA on the first \$50,000 of an annual pension benefit. The COLA will take effect on the retired member's first anniversary date of retirement occurring after July 1, 2020. The adjustment shall become a permanent addition to the member's base retirement allowance.

Other Ancillary Benefits

There are no ancillary benefits - retirement type benefits not required by statutes but which might be deemed a liability if continued beyond the availability of funding by the current funding source.

History of Recent Changes in Plan Provisions

2019 Legislative Session

House Bill No. 616:

This bill grants a one-time, 1.5% COLA on the first \$50,000 of an annual pension benefit to members who retired on or before July 1, 2014, or any beneficiaries of such member who is receiving a survivorship pension benefit. The COLA will take effect on the retired member's first anniversary date of retirement occurring after July 1, 2020. The adjustment shall become a permanent addition to the member's base retirement allowance.

2014 Legislative Session

House Bill No. 1494:

This bill: (1) adds definitions of terms used in RSA 100-A and clarifies existing definitions; (2) revises the procedure for calculating the cost of purchasing credit for certain types of prior service; (3) clarifies the ability to earn service credit while on a salary continuance plan; (4) corrects an inconsistency in the statute regarding the approval date of the comprehensive annual financial report; (5) adds penalties for employers who fail to remit correct data in a timely manner; and (6) repeals obsolete provisions.

2012 Legislative Session

- (a) Modifies the calculation of Average Final Compensation (AFC) for members not vested prior to Jan. 1, 2012, by changing the "compensation over base pay" factor used in the AFC formula from a dollar average to a percentage average.
- (b) Clarifies the date from which NHRS must begin calculating a 7-year average of Extra or Special Duty Pay for Group II (Police and Fire) members vested prior to Jan. 1, 2012. This change excludes from the calculation any months prior to July 1, 2009, which is when ESDP began to be separately reported to NHRS.
- (c) Clarifies the number of years of creditable service Group II (Police and Fire) members in service prior to July 1, 2011, but not vested prior to Jan. 1, 2012, must have in order to qualify for the supplemental disability benefit available to eligible Accidental Disability retirees.
- (d) Changes the annual effective date of changes to the member interest rate from a fiscal year to a calendar year.
- (e) Clarifies the definition of "compensation over base pay" for members not vested prior to Jan. 1, 2012.
- (f) Clarifies that the maximum benefit limit for members hired before July 1, 2009, is 100 percent of Earnable Compensation and the maximum benefit limit for members hired after that date, and not vested by Jan. 1, 2012, is the lesser of 85 percent of AFC or \$120,000 per year.
- (g) Modifies the definition of "part-time" for NHRS retirees employed by NHRS-participating employers.
- (h) Changes the date by which NHRS Trustees must approve the retirement system's Comprehensive Annual Financial Report from Dec. 1 to Dec. 31 of each year.

History of Recent Changes in Plan Provisions (Continued)

- (i) RSA 100-A:53, II; RSA 100-A:53-e, II; RSA 100-A:16, II(h); and RSA 100-A:16, II(j), relative to the Special Account, are repealed.
- (j) RSA 100-A:16, III-a, commonly known as the employer “spiking” assessment, is repealed.

2011 Legislative Session:

Legislation enacted in the 2011 legislative session is summarized below:

House Bill No. 2 as Amended by 2011-2513-CofC:

- (a) Change the definition of Earnable Compensation for active members who begin service on or after July 1, 2011 or who are not in vested status on and after January 1, 2012.
- (b) For active members who commenced service on or after July 1, 2011 or who have non-vested status on or after January 1, 2012 AFC equals the average annual earnable compensation during the highest 5 years of creditable service.
- (c) For members who commenced service on or after July 1, 2009 or are non-vested as of January 1, 2012, a member’s retirement benefit shall not exceed the lesser of 85% of the member’s highest average final compensation or \$120,000.
- (d) Group I members commencing service on or after July 1, 2011 are eligible to retire at age 65 and are eligible for a reduced annuity at age 60 with 30 years of creditable service. Prior to age 65, the state annuity, together with the member annuity, shall be equal to 1/66th of AFC times creditable service reduced for each month prior to the month after the member attains age 65 by 1/4 of 1%. After age 65, the state annuity, together with the member annuity, shall be equal to 1/66th of AFC times creditable service, reduced for each month prior to the month after the member attains age 65 by 1/4 of 1%.
- (e) Group II members commencing service on or after July 1, 2011 are eligible to retire at age 50 with 25 years of creditable service or age 60. The benefit shall be equal to 2% of AFC times creditable service up to 42.5 years. However, a member who commenced service on or after July 1, 2011 shall not receive a service retirement allowance until attaining the age of 52.5, but may receive a reduced allowance after age 50 if the member has at least 25 years of creditable service where the allowance shall be reduced, for each month by which the benefit commencement date precedes the month after which the member attains 52.5 years of age, by ¼ of 1%.
- (f) Group II members hired prior to July 1, 2011 who have non-vested status as of January 1, 2012 shall be subject to transition provisions for years of service required for regular service retirement, the minimum age for regular service retirement, and the multiplier used to calculate the retirement annuity, which shall be applicable on January 1, 2012.

History of Recent Changes in Plan Provisions (Continued)

- (g) Group II members commencing service on or after July 1, 2011 are eligible for an accidental disability benefit and shall receive a benefit equal to 2/3 of AFC. If a member has more than 33-1/3 years of service, the member will receive a supplemental disability benefit equal to 2% of AFC times years of creditable service in excess of 33-1/3 years but not in excess of 42.5 years.
- (h) *Member Contributions*
Group I members: 7.0% of earnable compensation.
Group II fire members: 11.80% of earnable compensation.
Group II police members: 11.55% of earnable compensation.
Group II member contributions cease for members who are in vested status before January 1, 2012 with creditable service in excess of 40 years. Member contributions cease for all other Group II members with creditable service in excess of 42.5 years.
- (i) *Medical Subsidy* – After July 1, 2007 and including each July 1, thereafter, the rate payable shall not be increased.
- (j) Interest on the individual accounts of members in the member annuity savings fund shall be credited interest at 2 percentage points less than either the most recent board of trustees approved assumed rate of return determined under RSA 100-A:16, II(h) or the actual rate of return, whichever is lower for the immediately preceding fiscal year as reported in the CAFR as approved and accepted by the board of trustees by December 1, of each year, provided the rate shall not be less than zero.
- (k) Any retired member who is receiving a medical subsidy under RSA 100-A:52 or RSA 100-A:52-a shall be entitled to receive an additional supplemental allowance. The amount of the additional temporary supplemental allowance shall be \$500 for retirees taking a one-person medical benefit and \$1,000 for retirees taking a 2-person medical benefit, paid from the respective component of the reserve for TSAs. The supplemental allowance shall apply only for the fiscal years beginning July 1, 2008 up to and including the fiscal year beginning July 1, 2012.
- (l) Transfer the balance in each special account component (Employees, Teachers, Police and Fire) to the corresponding components of the State annuity accumulation fund except for funds necessary to comply with RSA 100-A:41-d, III as amended.

History of Recent Changes in Plan Provisions (Concluded)

2010 Legislative Session:

Legislation enacted in the 2010 legislative session is summarized below:

- (a) **Special Session House Bill No. 1: COLA, TSA approved** - Provides cost-of-living adjustments (COLAs) and temporary supplemental allowances (TSAs) for eligible retirees or beneficiaries;
- (b) **Senate Bill 504: “Spiking” provision deferred** - Extends the effective date of the 2008 legislation creating the so-called “spiking” provision (125% assessment) from July 1, 2010 to July 1, 2011. A study commission continues to evaluate proposals for the assessment methodology;
- (c) **House Bill 1668: State medical subsidy insurance for Group II members [RSA 21-130]** - Requires Group II (Police and Fire) members whose service with a state agency or department began on or after July 1, 2010, complete at least 20 years of creditable service with the state in order to qualify for post-retirement state medical subsidy insurance coverage.

Medical Subsidy Plan Provisions

Subsidy Benefits as of July 1, 2007 and thereafter are as follows:

	Monthly Amounts	
	Pre-65	Post-65
Single	\$375.56	\$236.84
Couple	\$751.12	\$473.68

The above amounts will not increase.

The following Group I members and their qualified spouses are eligible for coverage under the postretirement medical plan:

- Employee and Teacher members of political subdivisions who are eligible to retire as of July 1, 2008, on Service, Early Service or Ordinary Disability, have at least 20 years of credited service as of July 1, 2008 and who actually retire on or before July 1, 2009 would become eligible for the medical subsidy at age 60 with at least 20 years of creditable service; or as early as age 55 with at least 30 years of creditable service.
- Employee and Teacher members of political subdivisions who are eligible to retire as of July 1, 2008, on Vested Deferred retirement and who actually retire on or before July 1, 2009 would become eligible for the medical subsidy at age 60 with at least 20 years of creditable service; or as early as age 55 with at least 30 years of creditable service.
- Employee and Teacher members of political subdivisions who retired on Accidental Disability Retirement on or before July 1, 2004.
- Employee members of the State who retired on or before July 1, 2004, on Service, Ordinary Disability or Vested Deferred Retirement would become eligible for the medical subsidy at age 60 with at least 20 years of creditable service; or as early as age 55 with at least 30 years of creditable service.
- Employee and Teacher members of political subdivisions who are eligible to retire as of July 1, 2008 and who actually retire on or before July 1, 2009, on Service, Early Service, Vested Deferred or Ordinary Disability retirement after completing at least 20 years of creditable service and who subsequently attain age 60 or after completing at least 30 years of creditable service and who subsequently attain age 55.
- Surviving spouses of deceased Employee and Teacher members of political subdivisions who die while in service and would otherwise have been eligible for a medical subsidy benefit, provided that such surviving spouse was covered as the member's spouse in the employer-sponsored plan before the member's death and is entitled to a monthly allowance under Accidental Death, Ordinary Death, or an Optional Allowance.
- Surviving spouses and children of Employee and Teacher members of political subdivisions who die as the natural and proximate result of injuries suffered while in the performance of duty. Eligibility for the medical subsidy ceases when the dependent child attains age 18, or age 23 if attending school on a full-time basis.

Medical Subsidy Plan Provisions (Concluded)

- Surviving spouses and children of Employee members of the State who died as the natural and proximate result of injuries suffered while in the performance of duty. Payment of the subsidy ceases when the dependent child attains age 18 or age 23, if attending school on a full-time basis.
- Vested terminated Employee members of the State (and spouses) who completed at least 20 years of creditable service and prior to July 1, 2004 receives an allowance and who subsequently attains age 60.
- Employee members of the State (and spouses) who retire after completing at least 20 years of creditable service and who subsequently attains age 60 before July 1, 2004 or after completing at least 30 years of creditable service and who subsequently attains age 55 before July 1, 2004.
- Surviving spouses of deceased Employee members of the State who died while in service on or before July 1, 2004, provided that such surviving spouse was covered as the member's spouse in the employer-sponsored plan before the member's death and is entitled to a monthly allowance under Accidental Death, Ordinary Death, or an Optional Allowance.
- Any certifiably dependent child with a disability living in the household and being cared for by the qualified retired member, member's spouse, or qualified surviving spouse would also qualify.

The following Group II members are eligible for the postretirement medical premium subsidy:

- Active or Retired Group II police officer members (or beneficiaries) as of June 30, 2000.
- Active or Retired Group II firefighter members (or beneficiaries) as of June 30, 2000.
- Persons who prior to July 1, 1988 had completed at least 20 years of Group II service and are eligible as of July 1, 1993 for a vested deferred retirement benefit.
- Group II members retired as of July 1, 1991 with a split benefit under RSA 100-A:19-c who have at least 10 years of Group II service.
- Group II members as of June 30, 2005 who subsequently became disabled while in the performance of duty at any time in the future.
- Surviving spouses of deceased Group II members who retired prior to April 1, 1987 and who are not receiving a monthly allowance.

The System subsidy covers the retired member's spouse and any of the retired member's certifiably dependent and disabled children.

It is the legislative intent that future members shall be included only to the extent that the total cost can be terminally funded.

SECTION D

STATISTICAL SECTION

Historical Membership Data - Retired (Dollars in Thousands)

Fiscal Year	Added to Rolls		Removed from Rolls		Rolls End of Year		Average	Average Annual
	No.**	Annual Allowances*	No.	Annual Allowances	No.	Annual Allowances	Annual Allowances	% Increase in Annual Allowances
2007	3,211	\$ 73,490	913	\$ 12,081	21,248	\$ 357,763	\$ 16,837	N/A
2008	2,216	53,600	594	10,923	22,870	400,440	17,509	4.0 %
2009	2,152	51,234	521	8,349	24,501	443,325	18,094	3.3 %
2010	2,161	50,732	817	12,002	25,845	482,055	18,652	3.1 %
2011	1,965	42,344	680	10,051	27,130	514,348	18,959	1.6 %
2012	2,073	41,213	749	11,543	28,454	544,018	19,119	0.8 %
2013	2,153	43,865	878	14,738	29,729	573,145	19,279	0.8 %
2014	2,105	42,200	780	12,676	31,054	602,669	19,407	0.7 %
2015 #	2,731	54,769	2,435	20,416	31,350	637,022	20,320	4.7 %
2016	2,208	53,489	782	12,236	32,776	678,275	20,694	1.8 %
2017	3,794	55,619	876	20,782	35,694	713,112	19,978	(3.5)%
2018	2,168	51,057	850	14,738	37,012	749,431	20,248	1.4 %
2019	2,355	56,216	1,015	17,011	38,352	788,636	20,563	1.6 %

* Includes additional COLA allowances. The benefit amounts shown are the monthly benefits as of the valuation date annualized and are not the actual benefits paid during the fiscal year.

** Includes beneficiaries in receipt but excludes deferred vested terminations.

As part of a data cleaning process, some records for individual participants were merged into one record; others were split to reflect split benefits.

Retirees and Beneficiaries Age Distribution Employees

SERVICE RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
45 - 49	19	\$ 91,948	\$ 4,839	5	\$ 18,114	\$ 3,623
50 - 54	87	969,782	11,147	58	816,963	14,086
55 - 59	215	3,652,158	16,987	258	4,671,803	18,108
60 - 64	919	19,698,372	21,435	1,342	22,971,631	17,117
65 - 69	1,702	31,052,819	18,245	2,439	33,832,041	13,871
70 - 74	1,697	27,955,032	16,473	2,407	28,238,961	11,732
75 - 79	1,055	15,234,550	14,440	1,511	15,516,205	10,269
80 - 84	632	8,458,028	13,383	798	7,128,738	8,933
85 - 89	310	4,330,098	13,968	434	3,684,685	8,490
90 - 94	113	1,248,343	11,047	205	1,647,773	8,038
95 - 99	26	349,161	13,429	50	373,465	7,469
100 & Over	2	10,322	5,161	4	18,440	4,610
TOTAL	6,777	\$ 113,050,613	\$ 16,682	9,511	\$ 118,918,819	\$ 12,503

DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
25 - 29		\$ -	\$ -	1	\$ 11,156	\$ 11,156
30 - 34						
35 - 39	2	31,292	15,646	2	39,443	19,722
40 - 44	1	11,038	11,038	7	91,727	13,104
45 - 49	13	190,119	14,625	13	198,054	15,235
50 - 54	35	533,677	15,248	32	414,501	12,953
55 - 59	65	994,967	15,307	78	1,107,820	14,203
60 - 64	78	1,100,004	14,103	111	1,511,376	13,616
65 - 69	99	1,410,784	14,250	109	1,365,411	12,527
70 - 74	62	833,275	13,440	84	1,004,137	11,954
75 - 79	40	610,320	15,258	49	599,862	12,242
80 - 84	17	206,045	12,120	12	171,994	14,333
85 - 89	5	61,104	12,221	5	72,435	14,487
90 - 94				2	29,303	14,652
95 - 99						
100 & Over						
TOTAL	417	\$ 5,982,625	\$ 14,347	505	\$ 6,617,219	\$ 13,103

Retirees and Beneficiaries Age Distribution Employees

BENEFICIARIES OF DECEASED MEMBERS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
Under 20						
20 - 24	2	\$ 3,695	\$ 1,848	2	\$ 6,839	\$ 3,420
25 - 29	3	32,175	10,725	4	12,714	3,179
30 - 34	2	7,136	3,568			
35 - 39	6	18,522	3,087	4	13,640	3,410
40 - 44	3	25,923	8,641	7	33,986	4,855
45 - 49	5	28,594	5,719	12	55,169	4,597
50 - 54	9	79,298	8,811	21	207,627	9,887
55 - 59	15	81,355	5,424	54	497,192	9,207
60 - 64	31	303,514	9,791	95	1,261,232	13,276
65 - 69	49	492,385	10,049	155	2,054,463	13,255
70 - 74	48	413,937	8,624	208	2,760,926	13,274
75 - 79	54	488,842	9,053	225	2,791,780	12,408
80 - 84	32	208,271	6,508	223	3,025,892	13,569
85 - 89	26	183,332	7,051	177	2,160,914	12,209
90 - 94	11	86,713	7,883	100	1,025,053	10,251
95 - 99	2	11,880	5,940	27	231,936	8,590
100 & Over				2	2,371	1,186
TOTAL	298	\$ 2,465,572	\$ 8,274	1,316	\$ 16,141,734	\$ 12,266

Retirees and Beneficiaries Age Distribution Teachers

SERVICE RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
40 - 44				1	\$ 4,337	\$ 4,337
45 - 49	1	\$ 2,566	\$ 2,566	1	7,782	7,782
50 - 54	4	89,424	22,356	27	417,136	15,449
55 - 59	64	1,480,343	23,130	192	4,089,962	21,302
60 - 64	286	8,240,239	28,812	1,263	31,134,834	24,651
65 - 69	869	21,631,787	24,893	2,953	67,539,227	22,871
70 - 74	1,087	26,415,517	24,301	2,796	59,226,384	21,183
75 - 79	562	13,255,766	23,587	1,191	22,774,806	19,122
80 - 84	272	6,767,185	24,879	605	11,756,898	19,433
85 - 89	144	3,621,191	25,147	278	5,453,822	19,618
90 - 94	46	948,613	20,622	128	2,338,330	18,268
95 - 99	5	93,416	18,683	35	487,551	13,930
100 & Over	1	16,715	16,715	7	112,058	16,008
TOTAL	3,341	\$ 82,562,762	\$ 24,712	9,477	\$ 205,343,127	\$ 21,668

DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
40 - 44				2	\$ 22,485	\$ 11,243
45 - 49	3	\$ 50,591	\$ 16,864	3	58,793	19,598
50 - 54	3	65,972	21,991	5	67,796	13,559
55 - 59	6	102,554	17,092	27	480,411	17,793
60 - 64	4	59,121	14,780	28	596,667	21,310
65 - 69	6	72,947	12,158	30	546,963	18,232
70 - 74	5	120,991	24,198	25	402,864	16,115
75 - 79	7	136,312	19,473	18	290,974	16,165
80 - 84	3	52,807	17,602	11	191,052	17,368
85 - 89	2	44,265	22,133	3	72,485	24,162
90 - 94	1	10,074	10,074			
95 - 99				1	12,009	12,009
100 & Over						
TOTAL	40	\$ 715,634	\$ 17,891	153	\$ 2,742,499	\$ 17,925

Retirees and Beneficiaries Age Distribution Teachers

BENEFICIARIES OF DECEASED MEMBERS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
Under 20						
20 - 24	1	\$ 9,010	\$ 9,010	1	\$ 8,961	\$ 8,961
25 - 29	2	17,971	8,986	1	9,572	9,572
30 - 34	1	4,741	4,741	4	30,084	7,521
35 - 39	1	21,039	21,039	3	34,399	11,466
40 - 44	4	47,149	11,787	3	9,587	3,196
45 - 49	5	36,933	7,387	2	22,002	11,001
50 - 54	9	83,830	9,314	5	41,824	8,365
55 - 59	14	135,489	9,678	5	91,881	18,376
60 - 64	14	252,288	18,021	33	676,180	20,490
65 - 69	38	724,838	19,075	62	1,134,984	18,306
70 - 74	64	1,066,990	16,672	98	2,246,100	22,919
75 - 79	51	779,036	15,275	98	2,397,342	24,463
80 - 84	40	715,666	17,892	71	1,720,000	24,225
85 - 89	19	309,656	16,298	49	1,111,986	22,694
90 - 94	8	144,757	18,095	13	182,147	14,011
95 - 99	2	31,170	15,585	7	62,236	8,891
100 & Over				1	2,808	2,808
TOTAL	273	\$4,380,563	\$16,046	456	\$9,782,093	\$21,452

Retirees and Beneficiaries Age Distribution Police

SERVICE RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
35 - 39				1	\$ 3,390	\$ 3,390
40 - 44				4	37,606	9,402
45 - 49	177	\$ 9,035,935	\$ 51,050	52	1,608,840	30,939
50 - 54	376	20,169,308	53,642	77	1,840,284	23,900
55 - 59	486	25,742,751	52,969	97	2,701,517	27,851
60 - 64	498	23,258,413	46,704	107	2,240,907	20,943
65 - 69	402	16,266,350	40,464	84	1,596,676	19,008
70 - 74	329	11,747,803	35,708	64	908,011	14,188
75 - 79	194	5,930,233	30,568	37	514,736	13,912
80 - 84	110	3,176,721	28,879	13	208,395	16,030
85 - 89	41	987,555	24,087	9	128,089	14,232
90 - 94	13	461,070	35,467	3	44,487	14,829
95 - 99	1	26,357	26,357			
100 & Over	1	47,166	47,166			
TOTAL	2,628	\$ 116,849,662	\$ 44,463	548	\$ 11,832,938	\$ 21,593

DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
25 - 29	2	\$ 52,263	\$ 26,132			
30 - 34	1	46,078	46,078	2	\$ 32,625	\$ 16,313
35 - 39	8	321,337	40,167	2	86,329	43,165
40 - 44	16	629,716	39,357	6	210,266	35,044
45 - 49	32	1,313,899	41,059	5	219,106	43,821
50 - 54	47	1,871,844	39,826	8	240,891	30,111
55 - 59	51	1,610,400	31,576	9	319,179	35,464
60 - 64	41	1,387,009	33,829	10	301,416	30,142
65 - 69	42	1,287,061	30,644	7	176,634	25,233
70 - 74	45	1,406,726	31,261	11	256,387	23,308
75 - 79	28	846,687	30,239	1	22,800	22,800
80 - 84	11	336,962	30,633	1	12,357	12,357
85 - 89	6	142,954	23,826			
95 - 99						
100 & Over	1	12,126	12,126			
TOTAL	331	\$ 11,265,062	\$ 34,033	62	\$ 1,877,990	\$ 30,290

Retirees and Beneficiaries Age Distribution Police

BENEFICIARIES OF DECEASED MEMBERS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
Under 20						
20 - 24						
25 - 29	3	\$ 36,502	\$ 12,167			
30 - 34	1	11,314	11,314			
35 - 39	1	3,427	3,427	3	\$ 22,208	\$ 7,403
40 - 44	1	3,427	3,427	5	71,583	14,317
45 - 49	1	3,991	3,991	6	84,836	14,139
50 - 54	3	49,397	16,466	13	380,088	29,238
55 - 59	2	16,824	8,412	36	820,945	22,804
60 - 64	5	113,887	22,777	50	1,070,964	21,419
65 - 69	6	59,555	9,926	56	924,434	16,508
70 - 74	2	34,403	17,202	90	1,822,447	20,249
75 - 79	2	34,094	17,047	85	1,295,936	15,246
80 - 84	4	33,194	8,299	56	773,392	13,811
85 - 89	1	3,044	3,044	43	635,231	14,773
90 - 94	2	20,243	10,122	26	384,239	14,778
95 - 99				6	68,733	11,456
100 & Over	1	12,498	12,498	3	43,500	14,500
TOTAL	35	\$ 435,800	\$ 12,451	478	\$ 8,398,536	\$ 17,570

Retirees and Beneficiaries Age Distribution

Fire

SERVICE RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
35 - 39				1	\$ 5,721	\$ 5,721
45 - 49	29	\$ 1,473,678	\$50,816	9	\$ 180,274	\$ 20,030
50 - 54	135	7,552,512	55,945	19	404,594	21,294
55 - 59	181	11,114,107	61,404	34	641,180	18,858
60 - 64	254	14,004,147	55,134	31	430,392	13,884
65 - 69	250	12,112,258	48,449	25	401,596	16,064
70 - 74	127	5,153,345	40,578	8	166,246	20,781
75 - 79	85	3,432,106	40,378	3	31,286	10,429
80 - 84	56	1,770,000	31,607	3	47,821	15,940
85 - 89	27	739,386	27,385			
90 - 94	13	353,092	27,161			
95 - 99	1	25,470	25,470			
100 & Over						
TOTAL	1,158	\$57,730,101	\$49,853	133	\$2,309,110	\$17,362

DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
35 - 39	2	\$ 58,274	\$ 29,137			
40 - 44	3	65,304	21,768			
45 - 49	8	274,067	34,258			
50 - 54	9	382,691	42,521	2	\$ 61,122	\$ 30,561
55 - 59	18	597,898	33,217	3	108,530	36,177
60 - 64	17	636,571	37,445	1	26,454	26,454
65 - 69	15	492,713	32,848			
70 - 74	9	266,062	29,562			
75 - 79	15	414,547	27,636			
80 - 84	11	285,899	25,991			
85 - 89	4	106,923	26,731			
90 - 94	2	62,928	31,464			
95 - 99						
100 & Over						
TOTAL	113	\$3,643,877	\$32,247	6	\$196,106	\$32,684

Retirees and Beneficiaries Age Distribution Fire

BENEFICIARIES OF DECEASED MEMBERS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
Under 20	1	\$ 5,913	\$ 5,913			
20 - 24						
25 - 29	1	5,913	5,913			
30 - 34				1	\$ 5,913	\$ 5,913
35 - 39						
40 - 44						
45 - 49	2	26,396	13,198	2	64,350	32,175
50 - 54	2	12,785	6,393	5	97,761	19,552
55 - 59	1	3,970	3,970	13	233,290	17,945
60 - 64	2	5,593	2,797	35	685,124	19,575
65 - 69				43	849,144	19,748
70 - 74				52	1,166,295	22,429
75 - 79				37	577,340	15,604
80 - 84	1	15,853	15,853	29	530,637	18,298
85 - 89				36	591,833	16,440
90 - 94	1	25,074	25,074	24	382,282	15,928
95 - 99				7	101,587	14,512
100 & Over				1	6,801	6,801
TOTAL	11	\$101,497	\$9,227	285	\$5,292,357	\$18,570

Active Members by Valuation Division

Valuation Group	Active Members	Valuation Payroll	Average		
			Age	Service*	Pay
Employees:					
Male	9,650	\$ 544,052,544	48.5	11.1	\$56,379
Female	15,004	700,877,668	49.3	10.7	46,713
Total	24,654	1,244,930,212	49.0	10.8	50,496
Teachers:					
Male	3,772	256,518,633	46.2	14.4	68,006
Female	13,958	879,087,891	45.9	13.2	62,981
Total	17,730	1,135,606,524	46.0	13.4	64,050
Police:					
Male	3,618	274,308,662	39.0	11.1	75,818
Female	598	38,707,587	38.6	8.7	64,728
Total	4,216	313,016,249	38.9	10.8	74,245
Fire:					
Male	1,648	128,660,330	41.4	13.1	78,071
Female	40	2,792,707	39.6	11.1	69,818
Total	1,688	131,453,037	41.3	13.1	77,875
Total:					
Male	18,688	1,203,540,169	45.6	11.9	64,402
Female	29,600	1,621,465,853	47.5	11.8	54,779
Grand Total	48,288	\$2,825,006,022	46.7	11.9	\$58,503

* One month of service was added to the reported service for all active participants in consideration of potential subsidized service purchases in the future.

Valuation Group	Active Members	Valuation Payroll
Employees:		
State	9,873	\$ 567,292,108
Political Subdivisions	14,781	677,638,104
Subtotal	24,654	1,244,930,212
Teachers:	17,730	1,135,606,524
Police:		
State	1,083	85,189,248
Political Subdivisions	3,133	227,827,001
Subtotal	4,216	313,016,249
Fire:		
State	64	4,292,320
Political Subdivisions	1,624	127,160,717
Subtotal	1,688	131,453,037
Total	48,288	\$ 2,825,006,022

Active Members Age and Service Distribution

Employees June 30, 2019

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	21							21	\$ 548,278
20-24	642	2						644	19,599,380
25-29	1,309	163	2					1,474	55,943,233
30-34	1,189	421	164	7				1,781	79,578,058
35-39	1,082	454	458	146	5			2,145	103,391,508
40-44	903	416	406	334	105	3		2,167	111,575,632
45-49	1,039	513	537	429	299	108	6	2,931	155,857,407
50-54	1,108	570	675	510	351	265	204	3,683	194,785,596
55-59	979	701	860	764	420	314	412	4,450	238,900,292
60-64	690	513	734	680	424	257	348	3,646	191,625,247
65-69	180	207	288	261	180	93	144	1,353	74,674,378
70+	50	44	76	67	45	27	50	359	18,451,203
TOTAL	9,192	4,004	4,200	3,198	1,829	1,067	1,164	24,654	\$ 1,244,930,212

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 49.0 years
Service: 10.8 years
Annual Pay: \$50,496

Active Members Age and Service Distribution

Teachers June 30, 2019

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19									\$ -
20-24	166							166	6,370,482
25-29	1,136	199	1					1,336	58,788,346
30-34	742	891	212					1,845	93,605,958
35-39	491	607	1,038	177				2,313	136,531,546
40-44	432	404	663	885	117			2,501	164,808,710
45-49	362	395	456	614	571	73	3	2,474	167,578,842
50-54	309	305	474	459	423	291	102	2,363	162,595,579
55-59	181	193	405	451	327	252	396	2,205	156,415,127
60-64	84	123	226	378	321	183	472	1,787	132,618,150
65-69	24	34	87	136	120	79	170	650	49,373,440
70+	2	3	21	16	15	8	25	90	6,920,344
TOTAL	3,929	3,154	3,583	3,116	1,894	886	1,168	17,730	\$ 1,135,606,524

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 46.0 years
 Service: 13.4 years
 Annual Pay: \$64,050

Active Members Age and Service Distribution

Police June 30, 2019

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	3							3	\$ 61,304
20-24	246							246	10,810,465
25-29	571	120						691	39,989,175
30-34	269	316	111	1				697	47,571,975
35-39	115	137	314	83	1			650	50,271,727
40-44	53	52	153	273	69			600	51,658,882
45-49	47	45	98	194	193	37		614	53,929,627
50-54	53	24	38	104	70	63	21	373	31,444,803
55-59	25	23	43	50	22	30	24	217	17,584,264
60-64	7	12	18	25	8	7	12	89	7,128,648
65-69	2	7	7	8	4		4	32	2,295,785
70+					2	1	1	4	269,594
TOTAL	1,391	736	782	738	369	138	62	4,216	\$ 313,016,249

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 38.9 years
 Service: 10.8 years
 Annual Pay: \$74,245

Active Members Age and Service Distribution

Fire June 30, 2019

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19									\$ -
20-24	63							63	3,235,532
25-29	143	44						187	11,271,477
30-34	100	97	59					256	16,610,218
35-39	50	48	108	46	1			253	18,809,170
40-44	23	24	59	107	29			242	19,692,318
45-49	11	12	47	95	70	28	1	264	23,021,553
50-54	6	12	32	91	49	44	20	254	22,899,605
55-59	6	4	11	27	22	16	35	121	11,305,205
60-64	2	3	3	10	6	7	7	38	3,580,362
65-69		2		2		1	3	8	882,321
70+		1	1					2	145,276
TOTAL	404	247	320	378	177	96	66	1,688	\$ 131,453,037

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 41.3 years
 Service: 13.1 years
 Annual Pay: \$77,875

Active Members Age and Service Distribution

**Total
June 30, 2019**

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	24							24	\$ 609,582
20-24	1,117	2						1,119	40,015,859
25-29	3,159	526	3					3,688	165,992,231
30-34	2,300	1,725	546	8				4,579	237,366,209
35-39	1,738	1,246	1,918	452	7			5,361	309,003,951
40-44	1,411	896	1,281	1,599	320	3		5,510	347,735,542
45-49	1,459	965	1,138	1,332	1,133	246	10	6,283	400,387,429
50-54	1,476	911	1,219	1,164	893	663	347	6,673	411,725,583
55-59	1,191	921	1,319	1,292	791	612	867	6,993	424,204,888
60-64	783	651	981	1,093	759	454	839	5,560	334,952,407
65-69	206	250	382	407	304	173	321	2,043	127,225,924
70+	52	48	98	83	62	36	76	455	25,786,417
TOTAL	14,916	8,141	8,885	7,430	4,269	2,187	2,460	48,288	\$ 2,825,006,022

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 46.7 years
Service: 11.9 years
Annual Pay: \$58,503

Historical Membership Data - Active

Total

Valuation Date	Active Members		Covered Payroll		Average Salary		Average	
	No.	% Inc.*	\$ Amount	% Inc.*	\$ Amount	% Inc.*	Age	Service
2007	50,802	(0.3%)	\$ 2,195,339,382	3.6%	\$ 43,214	3.9%	45.6	10.6
2008	50,988	0.2%	2,308,320,669	5.1%	45,272	4.8%	45.7	10.6
2009	51,032	0.0%	2,448,287,042	6.1%	47,976	6.0%	46.0	10.9
2010	50,467	(0.6%)	2,481,383,620	1.4%	49,168	2.5%	46.3	11.1
2011	49,738	(0.7%)	2,517,779,470	1.5%	50,621	3.0%	46.6	11.4
2012	48,625	(1.1%)	2,487,757,437	(1.2%)	51,162	1.1%	46.9	11.8
2013	48,688	0.1%	2,501,741,708	0.6%	51,383	0.4%	47.0	12.0
2014	48,307	(0.4%)	2,507,898,809	0.2%	51,916	1.0%	47.1	12.1
2015	47,812	(0.5%)	2,575,031,210	2.7%	53,857	3.7%	47.0	12.1
2016	48,069	0.3%	2,601,403,606	1.0%	54,118	0.5%	46.9	12.1
2017	47,886	(0.2%)	2,667,611,532	2.5%	55,708	2.9%	46.9	12.1
2018	48,121	0.2%	2,752,235,069	3.2%	57,194	2.7%	46.8	12.0
2019	48,288	0.2%	2,825,006,022	2.6%	58,503	2.3%	46.7	11.9

* Average annual increase.

By Valuation Group (Valuation Payroll in Thousands)

	Fiscal Year	Active Members [#]	Valuation Payroll	Average Compensation	% Inc.*
Employees	2019	24,654	\$1,244,930	\$50,496	2.70 %
Teachers		17,730	1,135,607	64,050	1.86 %
Police		4,216	313,016	74,245	3.11 %
Fire		1,688	131,453	77,874	0.51 %
Total		48,288	\$2,825,006	\$58,503	2.29 %

	Fiscal Year	Active Members [#]	Valuation Payroll	Average Compensation	% Inc.*
Employees	2018	24,511	\$1,205,121	\$49,167	2.03 %
Teachers		17,752	1,116,218	62,878	3.19 %
Police		4,197	302,199	72,004	2.71 %
Fire		1,661	128,697	77,481	2.77 %
Total		48,121	\$2,752,235	\$57,194	2.67 %

Excludes temporary inactive members.

* Average annual increase.

Summary of Membership Data by Category

	June 30									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Active Members										
Number	48,288	48,121	47,886	48,069	47,812	48,307	48,688	48,625	49,738	50,467
Average age (years)	46.7	46.8	46.9	46.9	47.0	47.1	47.0	46.9	46.6	46.3
Average service* (years)	11.9	12.0	12.1	12.1	12.2	12.1	12.0	11.8	11.4	11.1
Average salary	\$58,503	\$57,194	\$55,708	\$54,118	\$53,857	\$51,916	\$51,383	\$51,162	\$50,621	\$49,168
Total payroll supplied, annualized	\$ 2,825,006,022	\$ 2,752,235,069	\$ 2,667,611,532	\$ 2,601,403,606	\$ 2,575,031,210	\$ 2,507,898,809	\$ 2,501,741,708	\$ 2,487,757,437	\$ 2,517,779,470	\$ 2,481,383,620
Vested Inactive Members										
Number	2,552	2,420	2,281	1,785	1,999	1,297	1,261	1,372	1,496	1,515
Average age (years)	52.1	52.2	51.8	52.1	51.7	52.3	52.3	51.5	51.5	51.5
Non-Vested Inactive Members										
Number	12,530	11,454	10,477	9,528	8,690	8,102	7,273	7,041	5,677	5,677
Service Retirees										
Number	33,573	32,385	31,186	28,403	27,114	26,958	25,785	24,622	23,390	22,248
Average age (years)	70.0	70.0	70.0	70.0	69.0	69.0	69.2	69.0	69.0	68.0
Total annual benefits	\$ 708,597,132	\$ 673,359,556	\$ 639,679,378	\$ 608,332,888	\$ 570,043,185	\$ 537,980,513	\$ 511,111,807	\$ 484,434,150	\$ 457,444,791	\$ 427,718,788
Average annual benefit	\$ 21,106	\$ 20,792	\$ 20,512	\$ 21,418	\$ 21,024	\$ 19,956	\$ 19,822	\$ 19,675	\$ 19,557	\$ 19,225
Disability Retirees										
Number	1,627	1,616	1,600	1,600	1,586	1,561	1,558	1,542	1,511	1,474
Average age (years)	64.6	64.2	64.0	63.7	63.4	62.0	62.0	62.0	62.0	61.0
Total annual benefits	\$ 33,041,012	\$ 32,273,693	\$ 31,739,977	\$ 31,124,304	\$ 30,483,173	\$ 30,088,288	\$ 29,774,641	\$ 29,220,458	\$ 27,994,176	\$ 26,945,959
Average annual benefit	\$ 20,308	\$ 19,971	\$ 19,837	\$ 19,453	\$ 19,220	\$ 19,275	\$ 19,111	\$ 18,950	\$ 18,527	\$ 18,281
Beneficiaries										
Number	3,152	3,011	2,908	2,773	2,650	2,535	2,386	2,290	2,229	2,123
Average age (years)	74.5	74.2	73.9	73.9	73.6	73.4	73.4	73.0	73.0	73.0
Total annual benefits	\$ 46,998,152	\$ 43,797,864	\$ 41,692,950	\$ 38,818,283	\$ 36,495,210	\$ 34,600,022	\$ 32,258,707	\$ 30,363,269	\$ 28,908,530	\$ 27,390,320
Average annual benefit	\$ 14,911	\$ 14,546	\$ 14,337	\$ 13,999	\$ 13,772	\$ 13,649	\$ 13,520	\$ 13,259	\$ 12,969	\$ 12,902
Total Covered Lives	101,722	99,007	96,338	92,158	89,851	88,760	86,951	85,492	84,041	83,504

* One month of service was added to the reported service for all active participants in consideration of potential subsidized service purchases in the future.

Other Schedules of Interest

Schedule of Average Pension Benefit Payment Amounts as of June 30, 2019

Employees

Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Total annual benefit	\$ 5,176,441	\$ 10,016,116	\$ 34,108,206	\$ 35,560,518	\$ 44,332,746	\$ 39,332,602	\$ 94,649,953	\$ 263,176,582
Average annual benefit	\$ 3,948	\$ 5,577	\$ 7,571	\$ 11,350	\$ 14,768	\$ 20,380	\$ 30,076	\$ 13,981
Average monthly benefit	\$ 329	\$ 465	\$ 631	\$ 946	\$ 1,231	\$ 1,698	\$ 2,506	\$ 1,165
Average final compensation	\$ 46,039	\$ 43,399	\$ 42,728	\$ 48,931	\$ 51,957	\$ 59,277	\$ 67,912	\$ 51,524
Number of retired members	1,311 *	1,796	4,505	3,133	3,002	1,930	3,147	18,824 **

* Includes 336 members who did not have service reported.

** Includes 6,128 members who did not have AFC reported.

Teachers

Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Total annual benefit	\$ 1,912,767	\$ 2,593,138	\$ 14,870,082	\$ 24,504,624	\$ 48,828,884	\$ 53,567,158	\$ 159,250,025	\$ 305,526,678
Average annual benefit	\$ 6,131	\$ 6,878	\$ 8,974	\$ 13,995	\$ 18,350	\$ 23,382	\$ 33,948	\$ 22,236
Average monthly benefit	\$ 511	\$ 573	\$ 748	\$ 1,166	\$ 1,529	\$ 1,948	\$ 2,829	\$ 1,853
Average final compensation	\$ 53,185	\$ 58,121	\$ 51,835	\$ 61,061	\$ 65,406	\$ 69,802	\$ 74,587	\$ 66,591
Number of retired members	312 *	377	1,657	1,751	2,661	2,291	4,691	13,740 **

* Includes 147 members who did not have service reported.

** Includes 4,689 members who did not have AFC reported.

Police

Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Total annual benefit	\$ 5,228,311	\$ 3,529,521	\$ 8,935,577	\$ 10,836,035	\$ 62,739,757	\$ 39,775,011	\$ 19,615,776	\$ 150,659,988
Average annual benefit	\$ 11,856	\$ 17,134	\$ 19,510	\$ 27,928	\$ 38,585	\$ 56,579	\$ 75,445	\$ 36,908
Average monthly benefit	\$ 988	\$ 1,428	\$ 1,626	\$ 2,327	\$ 3,215	\$ 4,715	\$ 6,287	\$ 3,076
Average final compensation	\$ 53,911	\$ 57,433	\$ 55,574	\$ 68,749	\$ 82,921	\$ 97,193	\$ 108,491	\$ 80,632
Number of retired members	441 *	206	458	388	1,626	703	260	4,082 **

* Includes 298 members who did not have service reported.

** Includes 1,794 members who did not have AFC reported.

Fire

Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Total annual benefit	\$ 2,264,985	\$ 524,031	\$ 2,178,209	\$ 3,728,884	\$ 21,779,916	\$ 21,830,323	\$ 16,966,700	\$ 69,273,048
Average annual benefit	\$ 13,896	\$ 15,880	\$ 21,566	\$ 27,218	\$ 34,626	\$ 51,853	\$ 76,427	\$ 40,606
Average monthly benefit	\$ 1,158	\$ 1,323	\$ 1,797	\$ 2,268	\$ 2,886	\$ 4,321	\$ 6,369	\$ 3,384
Average final compensation	\$ 59,820	\$ 59,140	\$ 62,631	\$ 73,625	\$ 80,335	\$ 93,449	\$ 104,172	\$ 87,185
Number of retired members	163 *	33	101	137	629	421	222	1,706 **

* Includes 144 members who did not have service reported.

** Includes 903 members who did not have AFC reported.

Other Schedules of Interest

Schedule of Retired and Vested Members by Type of Benefit

Employees

June 30, 2019																			
		Type of Retirement**							Option Selected #										
Amount of Monthly Benefit	Number of Retirees*	1	2	3	4	5	6	7	No. Option	1	2	3	4	5	6	7	8	9	Other&
\$1 - \$500	5,436	4,273	48	2	14	-	581	518	3,117	118	357	126	859	315	13	13	-	-	518
501 - 1,000	5,702	4,360	261	109	13	2	453	504	3,173	91	430	127	989	367	15	6	-	-	504
1,001 - 1,500	3,460	2,703	87	231	12	4	207	216	1,791	64	316	98	686	279	7	3	-	-	216
1,501 - 2,000	2,054	1,727	25	98	6	3	122	73	1,041	29	207	83	446	166	6	3	-	-	73
2,001 - 2,500	1,271	1,123	10	25	-	2	80	31	554	12	154	57	334	123	2	4	-	-	31
2,501 - 3,000	804	731	6	8	1	1	47	10	334	15	111	43	193	96	1	1	-	-	10
3,001 - 3,500	532	495	-	6	2	-	21	8	204	5	99	30	136	49	1	-	-	-	8
3,501 - 4,000	384	360	2	1	-	-	19	2	149	6	64	25	96	41	1	-	-	-	2
Over 4,000	547	516	1	2	4	-	20	4	198	5	94	47	129	68	1	1	-	-	4
Totals	20,190	16,288	440	482	52	12	1,550	1,366	10,561	345	1,832	636	3,868	1,504	47	31	-	-	1,366

Teachers

June 30, 2019																			
		Type of Retirement**							Option Selected #										
Amount of Monthly Benefit	Number of Retirees*	1	2	3	4	5	6	7	No. Option	1	2	3	4	5	6	7	8	9	Other&
\$1 - \$500	1,650	1,261	1	-	-	-	88	300	705	27	113	42	355	98	5	5	-	-	300
501 - 1,000	2,266	1,692	32	-	5	-	156	381	1,190	38	137	37	383	92	6	2	-	-	381
1,001 - 1,500	2,104	1,708	79	3	6	-	113	195	1,022	41	179	61	461	135	5	5	-	-	195
1,501 - 2,000	2,099	1,859	30	5	7	-	118	80	985	47	173	52	545	206	2	9	-	-	80
2,001 - 2,500	2,104	1,950	17	10	-	1	83	43	913	36	192	78	592	238	4	8	-	-	43
2,501 - 3,000	1,628	1,539	7	4	-	-	58	20	684	36	147	56	468	212	1	4	-	-	20
3,001 - 3,500	1,365	1,302	3	2	-	-	49	9	579	23	133	54	418	141	2	6	-	-	9
3,501 - 4,000	798	771	-	-	2	-	22	3	344	16	89	26	210	109	-	1	-	-	3
Over 4,000	760	736	-	-	1	-	20	3	354	6	89	33	174	101	-	-	-	-	3
Totals	14,774	12,818	169	24	21	1	707	1,034	6,776	270	1,252	439	3,606	1,332	25	40	-	-	1,034

See Page 114 for footnotes.

Other Schedules of Interest

Schedule of Retired and Vested Members by Type of Benefit

Police

June 30, 2019																				
		Type of Retirement**							Option Selected #											
Amount of Monthly Benefit	Number of Retirants*								No.										Other&	
		1	2	3	4	5	6	7	Option	1	2	3	4	5	6	7	8	9		
\$1 - \$500	227	188	-	-	-	1	36	2	152	1		11	14	22	25	-	-	-	-	2
501 - 1,000	368	201	12	1	1	-	139	14	269	5		15	10	21	31	1	2	-	-	14
1,001 - 1,500	426	194	24	5	2	1	158	42	289	9		14	16	19	37	-	-	-	-	42
1,501 - 2,000	363	218	18	32	2	1	69	23	215	11		8	26	17	63	-	-	-	-	23
2,001 - 2,500	413	295	9	57	1	1	27	23	193	18		12	54	15	96	-	2	-	-	23
2,501 - 3,000	443	303	2	94	-	-	33	11	186	21		13	74	15	123	-	-	-	-	11
3,001 - 3,500	408	344	1	42	2	3	13	3	144	15		9	98	9	129	-	1	-	-	3
3,501 - 4,000	348	300	2	32	1	-	10	3	118	8		3	72	8	136	-	-	-	-	3
Over 4,000	1,211	1,133	2	60	1	1	10	4	319	19		13	337	19	497	3	-	-	-	4
Totals	4,207	3,176	70	323	10	8	495	125	1,885	107		98	701	145	1,137	4	5	-	-	125

Fire

June 30, 2019																				
		Type of Retirement**							Option Selected #											
Amount of Monthly Benefit	Number of Retirants*								No.										Other&	
		1	2	3	4	5	6	7	Option	1	2	3	4	5	6	7	8	9		
\$1 - \$500	50	29	-	-	-	2	19	-	42	-		3	-	1	4	-	-	-	-	-
501 - 1,000	106	43	2	-	-	-	59	2	99	-		1	-	1	3	-	-	-	-	2
1,001 - 1,500	173	72	7	3	1	3	77	10	131	5		7	7	8	5	-	-	-	-	10
1,501 - 2,000	157	69	8	8	-	1	67	4	117	7		5	7	7	10	-	-	-	-	4
2,001 - 2,500	168	102	7	17	1	3	34	4	93	8		7	20	7	29	-	-	-	-	4
2,501 - 3,000	164	129	2	23	-	-	8	2	58	8		4	30	9	53	-	-	-	-	2
3,001 - 3,500	164	140	-	17	-	2	4	1	47	6		3	41	3	63	-	-	-	-	1
3,501 - 4,000	151	135	-	10	-	1	2	3	48	5		2	30	1	62	-	-	-	-	3
Over 4,000	600	572	-	15	1	-	11	1	166	11		1	157	5	257	1	1	-	-	1
Totals	1,733	1,291	26	93	3	12	281	27	801	50		33	292	42	486	1	1	-	-	27

See Page 114 for footnotes.

**** Type of Retirement**

- 1-Service & early retirement
- 2-Ordinary disability retirement
- 3-Accidental disability retirement
- 4-Ordinary death in active service
- 5-Accidental death in active service
- 6-Beneficiaries of deceased members who retired on a service or disability allowance
- 7-Vested member with future benefit

Option Selected

- No option - Straight life
- Option 1 - Cash refund
- Option 2 - 100% Joint & Survivorship
- Option 3 - 50% Joint & Survivorship
- Option 4 - 100% Pop-Up
- Option 5 - 50% Pop-Up
- Option 6 - Other % Joint & Survivorship
- Option 7 - Other % Pop-Up
- Option 8 - Fixed amount to Beneficiaries
- Option 9 - Widow's benefit (accidental disability) 50%

** Including Vested members with a future benefit.
& Elections for Vested members are made at the time of commencement.*

Other Schedules of Interest

Schedule of Average Benefit Payment Amounts as of June 30, 2019

Medical Benefits

State Employees								
Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Average annual benefit	\$ 4,233	\$ 4,673	\$ 4,089	\$ 4,111	\$ 3,897	\$ 4,155	\$ 4,225	\$ 4,135
Average monthly benefit	\$ 353	\$ 389	\$ 341	\$ 343	\$ 325	\$ 346	\$ 352	\$ 345
Annual Benefits	\$304,752	\$266,337	\$269,904	\$152,092	\$1,574,269	\$1,167,516	\$2,640,822	\$6,375,692
Number of retired members	72	57	66	37	404	281	625	1,542

* Includes 6 members who did not have service reported.

Political Subdivision Employees								
Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Average annual benefit	\$ 3,098	\$ 3,450	\$ 3,139	\$ 4,344	\$ 4,142	\$ 4,093	\$ 4,736	\$ 4,262
Average monthly benefit	\$ 258	\$ 288	\$ 262	\$ 362	\$ 345	\$ 341	\$ 395	\$ 355
Annual Benefits	\$40,276	\$27,602	\$31,387	\$13,033	\$2,203,442	\$1,068,319	\$1,411,215	\$4,795,274
Number of retired members	13	8	10	3	532	261	298	1,125

* Includes 7 members who did not have service reported.

Teachers								
Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Average annual benefit	\$ 2,926	\$2,842	\$ 5,292	\$0	\$ 4,337	\$ 4,442	\$ 4,948	\$ 4,693
Average monthly benefit	\$ 244	\$ 237	\$ 441	\$ 0	\$ 361	\$ 370	\$ 412	\$ 391
Annual Benefits	\$52,676	\$11,368	\$15,875	\$0	\$4,015,882	\$3,926,714	\$11,395,782	\$19,418,297
Number of retired members	18	4	3	0	926	884	2,303	4,138

* Includes 12 members who did not have service reported.

Police and Fire								
Service	0 - 4 yrs.*	5 - 9 yrs.	10 - 14 yrs.	15 - 19 yrs.	20 - 24 yrs.	25 - 29 yrs.	30 or more yrs.	Total
Average annual benefit	\$ 4,344	\$ 4,365	\$ 5,106	\$ 4,945	\$ 5,736	\$ 6,274	\$ 6,256	\$ 5,793
Average monthly benefit	\$ 362	\$ 364	\$ 425	\$ 412	\$ 478	\$ 523	\$ 521	\$ 483
Annual Benefits	\$256,277	\$314,250	\$837,344	\$860,432	\$7,462,471	\$4,555,219	\$2,345,957	\$16,631,950
Number of retired members	59	72	164	174	1,301	726	375	2,871

* Includes 20 members who did not have service reported.

Number counts include 26 retirees who are eligible for a deferred subsidy.

Other Schedules of Interest

Schedule of Retired Members by Type of Benefits

Medical Benefits

State Employees

June 30, 2019					
Monthly Benefit	No. of Retirees	1 Person		2 Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	1,457	49	1,370	0	38
501-1,000	85	4	42	14	25
1,001-1,500	0	0	0	0	0
1,501-2,000	0	0	0	0	0
Over 2,000	0	0	0	0	0
Total	1,542	53	1,412	14	63

Political Subdivision Employees

June 30, 2019					
Monthly Benefit	No. of Retirees	1 Person		2 Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	1,071	21	1,043	0	7
501-1,000	53	1	25	2	25
1,001-1,500	1	0	1	0	0
1,501-2,000	0	0	0	0	0
Over 2,000	0	0	0	0	0
Total	1,125	22	1,069	2	32

Other Schedules of Interest

Schedule of Retired Members by Type of Benefits

Medical Benefits

Teachers

June 30, 2019					
Monthly Benefit	No. of Retirees	1-Person		2-Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	3,726	36	3,633	0	57
501-1,000	408	4	105	8	291
1,001-1,500	4	0	2	0	2
1,501-2,000	0	0	0	0	0
Over 2,000	0	0	0	0	0
Total	4,138	40	3,740	8	350

Police and Fire

June 30, 2019					
Monthly Benefit	No. of Retirees	1-Person		2-Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	1,900	452	1,422	14	12
501-1,000	947	35	241	651	20
1,001-1,500	16	2	4	5	5
1,501-2,000	8	0	0	8	0
Over 2,000	0	0	0	0	0
Total	2,871	489	1,667	678	37

Other Schedules of Interest

Historical Membership Data - Retiree

EMPLOYEES (aggregate compensation and annual allowance dollars in thousands)

RETIRED MEMBERSHIP DATA

Fiscal Year	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	No.**	Annual Allowances*	No.**	Annual Allowances*	No.**	Annual Allowances*		
2019	1,271	\$ 21,869	640	\$ 7,801	18,824	\$ 263,177	5.65%	\$ 13,981
2018	1,133	19,288	513	6,556	18,193	249,109	5.39%	13,693
2017	1,950	22,224	519	8,977	17,573	236,377	5.94%	13,451
2016	1,134	19,332	475	4,636	16,142	223,130	7.05%	13,823
2015 +	1,504	21,357	1335	10,968	15,483	208,434	5.25%	13,462
2014	1,094	15,784	492	5,431	15,314	198,045	5.52%	12,932
2013	1,110	16,335	539	6,699	14,712	187,692	5.41%	12,758
2012	1,111	14,711	457	4,890	14,141	178,056	5.84%	12,591
2011	1,113	16,521	428	4,578	13,487	168,235	7.64%	12,474
2010	1,070	18,300	460	4,624	12,802	156,292	9.59%	12,208
2009	934	14,703	322	3,864	12,192	142,616	8.23%	11,697
2008	1,083	17,897	362	4,199	11,580	131,777	11.60%	11,380
2007	1,465	22,691	579	5,471	10,859	118,079	17.07%	10,874
2005	1,620	19,183	739	5,972	9,973	100,859	18.56%	10,113
2003	1,258	13,588	572	4,029	9,092	85,067	18.11%	9,356
2001	1,095	10,078	617	3,965	8,406	72,025	17.11%	8,568
1999	1,183	10,077	571	3,195	7,928	61,501	20.00%	7,757

TEACHERS (aggregate compensation and annual allowance dollars in thousands)

RETIRED MEMBERSHIP DATA

Fiscal Year	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	No.**	Annual Allowances*	No.**	Annual Allowances*	No.**	Annual Allowances*		
2019	774	\$ 20,617	257	\$ 6,371	13,740	\$ 305,527	4.89%	\$ 22,236
2018	766	20,526	239	6,075	13,223	291,281	5.22%	22,028
2017	1,523	21,713	237	8,847	12,696	276,830	4.87%	21,804
2016	760	19,954	209	5,325	11,410	263,964	5.87%	23,134
2015+	840	21,563	946	6,891	10,859	249,335	6.25%	22,961
2014	744	17,222	186	4,802	10,965	234,663	5.59%	21,401
2013	698	15,844	247	5,860	10,407	222,243	4.70%	21,355
2012	712	16,420	183	5,150	9,956	212,259	5.61%	21,320
2011	504	10,402	164	3,644	9,427	200,989	3.48%	21,321
2010	849	22,231	269	5,199	9,087	194,231	9.61%	21,375
2009	1,001	26,668	148	3,214	8,507	177,199	15.26%	20,830
2008	891	23,743	165	4,238	7,654	153,745	14.53%	20,087
2007	1,254	29,350	230	4,004	6,928	134,240	23.28%	19,376
2005	1,121	21,842	344	4,591	5,904	108,894	24.34%	18,444
2003	848	15,910	239	2,735	5,127	87,580	26.86%	17,082
2001	501	8,375	272	2,691	4,518	69,036	12.62%	15,280
1999	685	11,458	292	2,504	4,289	61,301	25.29%	14,293

* Includes additional COLA allowances. The benefit amounts shown are the monthly benefits as of the valuation date annualized and are not the actual benefits paid during the fiscal year.

** Includes beneficiaries in receipt but excludes deferred vested terminations.

+ June 30, 2015 data included a reclassification of members with split benefits resulting in an artificially high number of new additions to the rolls.

Other Schedules of Interest

Historical Membership Data - Retiree

POLICE OFFICERS (aggregate compensation and annual allowance dollars in thousands)

RETIRED MEMBERSHIP DATA

Fiscal Year	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	No.**	Annual Allowances*	No.**	Annual Allowances*	No.**	Annual Allowances*		
2019	230	\$ 9,739	71	\$ 1,595	4,082	\$ 150,660	5.71%	\$ 36,908
2018	201	7,976	64	1,390	3,923	142,516	4.85%	36,328
2017	233	7,985	76	1,745	3,786	135,930	4.81%	35,903
2016	239	10,027	67	1,339	3,629	129,690	7.18%	35,737
2015+	282	7,303	107	1,675	3,457	121,002	4.88%	35,002
2014	178	6,420	59	1,304	3,282	115,374	4.64%	35,154
2013	247	8,189	65	1,464	3,163	110,258	6.50%	34,859
2012	171	6,977	70	1,008	2,981	103,533	6.12%	34,731
2011	237	10,370	59	1,133	2,880	97,564	10.46%	33,876
2010	189	7,711	52	1,413	2,702	88,327	7.68%	32,689
2009	157	7,235	28	627	2,565	82,029	8.76%	31,980
2008	179	8,504	36	1,376	2,436	75,421	10.44%	30,961
2007	361	14,045	80	1,540	2,293	68,293	22.42%	29,783
2005	308	8,934	83	1,492	2,012	55,788	17.68%	27,728
2003	262	7,903	61	971	1,787	47,406	23.81%	26,528
2001	280	6,085	63	960	1,586	38,290	25.58%	24,142
1999	238	5,790	39	604	1,369	30,490	30.00%	22,272

FIREFIGHTERS (aggregate compensation and annual allowance dollars in thousands)

RETIRED MEMBERSHIP DATA

Fiscal Year	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	No.**	Annual Allowances*	No.**	Annual Allowances*	No.**	Annual Allowances*		
2019	80	\$ 3,992	47	\$ 1,244	1,706	\$ 69,273	4.13%	\$ 40,606
2018	68	3,266	34	717	1,673	66,525	3.98%	39,764
2017	88	3,697	44	1,213	1,639	63,976	4.04%	39,033
2016	75	4,177	31	936	1,595	61,492	5.56%	38,553
2015+	105	4,546	47	882	1,551	58,251	6.71%	37,557
2014	89	2,774	43	1,139	1,493	54,587	3.09%	36,562
2013	98	3,497	27	715	1,447	52,952	5.55%	36,595
2012	79	3,105	39	495	1,376	50,170	5.49%	36,461
2011	111	5,051	29	696	1,336	47,560	10.08%	35,599
2010	53	2,490	36	766	1,254	43,205	4.16%	34,454
2009	60	2,628	23	644	1,237	41,481	5.02%	33,533
2008	63	3,456	31	1,110	1,200	39,497	6.31%	32,914
2007	131	7,404	24	1,066	1,168	37,151	20.57%	31,807
2005	128	4,393	66	1,290	1,061	30,813	15.83%	29,041
2003	142	4,747	49	1,067	999	26,602	30.26%	26,629
2001	164	3,861	39	541	906	20,422	29.36%	22,541
1999	108	2,684	41	514	781	15,787	25.03%	20,214

* Includes additional COLA allowances. The benefit amounts shown are the monthly benefits as of the valuation date annualized and are not the actual benefits paid during the fiscal year.

** Includes beneficiaries in receipt but excludes deferred vested terminations.

+ June 30, 2015 data included a reclassification of members with split benefits resulting in an artificially high number of new additions to the rolls.