

# New Hampshire Retirement System

CAFR Schedules, GASB Statement Nos. 67 and 74

Plan Reporting and Accounting Schedules

June 30, 2018





October 31, 2018

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, 2018.
- 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, 2018.
- 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, 2018. 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.

The actuarial calculations for funding purposes as of June 30, 2018 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, 2018. The actuarial accrued liability as of June 30, 2018 differs from the total pension (OPEB) liability as of June 30, 2018 under GASB Nos. 67 and 74 because the total pension (OPEB) liability is based on a roll-forward of the June 30, 2017 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 Statements No. 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, 2018 accounting report of the NHRS is accurate and fairly presents the actuarial position of the New Hampshire Retirement System as of June 30, 2018 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**

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### **INTRODUCTION**

## Executive Summary Pension

Covered Group	Employees	Teachers	Police	Fire	Total
<b>I. Number of Participants as of June 30, 2018</b>					
a. Actives	24,511	17,752	4,197	1,661	48,121
b. Retirees, Disabilities, and Beneficiaries	18,193	13,223	3,923	1,673	37,012
c. Vested Terminations	1,324	947	127	22	2,420
d. Non-Vested Inactive Terminations	7,542	53	597	3,262	11,454
e. Total	51,570	31,975	8,844	6,618	99,007
f. Total Covered Annual Payroll	\$ 1,205,120,628	\$ 1,116,218,440	\$ 302,199,442	\$ 128,696,559	\$ 2,752,235,069
<b>II. GASB No. 67 Information</b>					
a. Total Pension Liability (TPL)					\$ 13,652,069,393
b. Plan Fiduciary Net Position (PFNP)					8,836,866,976
c. Net Pension Liability (NPL): a. – b.					4,815,202,417
d. PFNP as a Percentage of TPL: b. / a.					64.7%
<b>III. Statutory Funding Information</b>					
a. Actuarial Present Value of Projected Benefits	\$ 5,177,828,524	\$ 6,143,610,381	\$ 2,998,093,667	\$ 1,423,362,211	\$ 15,742,894,783
b. Actuarial Present Value of Future Normal Costs	684,114,255	775,577,227	381,441,270	198,613,340	2,039,746,092
c. Actuarial Accrued Liability (AAL): a. – b.	4,493,714,269	5,368,033,154	2,616,652,397	1,224,748,871	13,703,148,691
d. Actuarial Value of Assets	2,922,357,782	3,176,932,495	1,758,300,711	853,348,344	8,710,939,332
e. Unfunded Actuarial Accrued Liability (UAAL): c. – d.	\$ 1,571,356,487	\$ 2,191,100,659	\$ 858,351,686	\$ 371,400,527	\$ 4,992,209,359
f. Funded Status: d. / c.	65.0%	59.2%	67.2%	69.7%	63.6%
<b>IV. Additional Information on Payroll</b>					
State	\$ 547,551,420	\$ -	\$ 77,616,665	\$ 4,237,855	\$ 629,405,940
Political Subdivisions	657,569,208	1,116,218,440	224,582,777	124,458,704	2,122,829,129
Total	\$ 1,205,120,628	\$ 1,116,218,440	\$ 302,199,442	\$ 128,696,559	\$ 2,752,235,069

NOTE: GASB No. 67 TPL is based on a roll-forward of the June 30, 2017 valuation. Statutory Funding information is based on data/information provided as of June 30, 2018.



## Executive Summary Medical Subsidy

Covered Group	State Employees	Political Subdivision Employees	Teachers	Police and Fire	Grand Total
<b>I. Number of Participants Covered by Post Retirement Medical Subsidy as of June 30, 2018</b>					
a. Actives	-	-	-	2,427	2,427
b. Retirees, Disabilities, and Beneficiaries	1,640	1,170	4,216	2,843	9,869
c. Vested Terminations	-	-	-	-	-
d. Total	1,640	1,170	4,216	5,270	12,296
e. Total NHRS Covered Annual Payroll	\$ 547,551,420	\$ 657,569,208	\$ 1,116,218,440	\$ 430,896,001	\$ 2,752,235,069
<b>II. GASB No. 74 Information</b>					
a. Total OPEB Liability (TOL)					\$ 495,154,024
b. Plan Fiduciary Net Position (PFNP)					37,308,259
c. Net OPEB Liability (NOL): a. – b.					457,845,765
d. PFNP as a Percentage of TOL: b. / a.					7.5%
<b>III. Statutory Funding Information</b>					
a. Actuarial Present Value of Projected Benefits	\$ 63,392,160	\$ 53,286,521	\$ 240,723,007	\$ 341,698,493	\$ 699,100,181
b. Actuarial Present Value of Future Normal Costs	-	-	-	9,523,371	9,523,371
c. Actuarial Accrued Liability (AAL): a. – b.	63,392,160	53,286,521	240,723,007	332,175,122	689,576,810
d. Valuation Assets	2,283,828	16,573,096	4,961,263	12,958,420	36,776,607
e. Unfunded Actuarial Accrued Liability (UAAL): c. – d.	61,108,332	36,713,425	235,761,744	319,216,702	652,800,203
f. Funded Status: d. / c.	3.6%	31.1%	2.1%	3.9%	5.3%

NOTE: GASB No. 74 TOL is based on a roll-forward of the June 30, 2017 valuation. Statutory Funding information is based on data/information provided as of June 30, 2018.

## Discussion and Comments

### Comment 1:

In total, plan experience between June 30, 2017 and June 30, 2018 was favorable for pension on the basis of statutory funding and GASB No. 67 and unfavorable for the medical subsidy on the basis of statutory funding.

Total covered payroll increased by 3.2% versus the assumed increase of 3.25% (2.75% for Teachers). Between the 2017 and 2018 valuation, the pension funded ratio increased by 1.8 percentage points from 61.8% to 63.6%.

The impact on GASB No. 67 was an increase in the ratio of plan fiduciary net position to total pension liability from 62.7% to 64.7%. 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, 2018 was 8.77% 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 8.40% on the actuarial value of assets, resulting in a recognized asset gain of \$93 million (pension and medical subsidy combined). The return on the market value of assets exceeds the return on the actuarial value of assets because some of this year's market return is deferred and prior years' low returns are recognized this year.

The Market Value of Assets of the System of \$8.9 billion is greater than the Actuarial Value of Assets of \$8.7 billion by \$126 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 gain of \$26 million comprised of an asset gain of \$93 million and a liability loss of \$67 million. See page 40 for additional information on gains and losses.

### Comment 2:

In June 2015, the Governmental Accounting Standards Board (GASB) issued new OPEB Accounting Standards No. 74 and No. 75 for OPEB systems and sponsoring governmental entities respectively. The effective date is the first fiscal year following June 15, 2016 for plan disclosures and the first fiscal year following June 15, 2017 for Employer disclosures.

The steps in this implementation process are as follows:

- This report includes GASB No. 74 information for the plan's fiscal year ending June 30, 2018. This includes the determination of the GASB discount rate for the OPEB plan as a whole.
- Based on our discussion with NHRS staff, the participating employers have fiscal years ending June 30th, September 30th or December 31st. Under the GASB rules, employers with a fiscal year ending September 30, 2018, December 31, 2018 or June 30, 2019 may use a measurement date as of June 30, 2018.

## Discussion and Comments (Concluded)

### Comment 3:

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. The amortization period for the unfunded liability as of June 30, 2017 is 20 years for Fiscal Year 2020 and 19 years for Fiscal Year 2021.

The closed amortization period means that the unfunded actuarial accrued liability is expected to be fully paid off by June 30, 2039 if all assumptions are met. It is important to note that the current amortization period is expected to result in “negative amortization”, meaning that the UAAL is expected to increase in nominal (but not real) dollars for the next few years.

## 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**

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### **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, 2017 rolled forward to the measurement date of June 30, 2018. The roll forward procedure increases the June 30, 2017 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	
June 30 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%

# Statement of Fiduciary Net Position as of June 30, 2018 Pension

	<b>2018*</b>
<b>Assets</b>	
Cash and Deposits	\$ 290,202,520
Receivables	
Accounts Receivable - Sale of Investments	\$ 17,325,934
Interest and Dividend Receivables	17,047,481
Contributions	68,342,068
Accounts Receivable - Other	4,465,283
<b>Total Receivables</b>	<b>\$ 107,180,766</b>
Investments	
Fixed Income	\$ 1,826,243,160
Domestic Equities	2,943,605,916
International Equities	1,277,624,600
Real Estate	802,177,409
Other	1,627,810,382
<b>Total Investments</b>	<b>\$ 8,477,461,467</b>
<b>Total Assets</b>	<b>\$ 8,874,844,753</b>
 <b>Liabilities</b>	
Payables	
Accounts Payable - Purchase of Investments	\$ 28,053,986
Accrued Expenses	9,923,791
<b>Total Liabilities</b>	<b>\$ 37,977,777</b>
<b>Net Position Restricted for Pensions</b>	<b>\$ 8,836,866,976</b>

\* Reported amounts provided by the System as of June 30, 2018 do not include the 401(h) medical subsidy account.

# Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2018

## Pension

	<b>Total</b>
<b>Additions</b>	
Contributions	
Employer	\$ 422,659,079
Member	217,571,830
<b>Total Contributions</b>	<b>\$ 640,230,909</b>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 557,164,718
Interest and Dividends	188,681,016
Less Investment Expense	(28,755,440)
<b>Net Investment Income</b>	<b>\$ 717,090,294</b>
<b>Total Additions</b>	<b>\$ 1,357,321,203</b>
 <b>Deductions</b>	
Benefit Payments and Refunds	\$ 765,763,128
Pension Plan Administrative Expense	7,767,254
Other custodial, professional and non-investment expenses	911,824
<b>Total Deductions</b>	<b>\$ 774,442,206</b>
<b>Net Increase in Net Position</b>	<b>\$ 582,878,997</b>
 <b>Net Position Restricted for Pensions</b>	
<b>Beginning of Year</b>	<b>\$ 8,253,987,979</b>
<b>End of Year</b>	<b>\$ 8,836,866,976</b>



## 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, 2018	June 30, 2017	June 30, 2016	June 30, 2015	June 30, 2014	June 30, 2013
<b>Total Pension Liability</b>						
Service Cost	\$ 269,751,007	\$ 262,626,490	\$ 266,379,101	\$ 243,964,955	\$ 245,827,165	\$ 255,178,452
Interest on the Total Pension Liability	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	39,112,535	(19,046,986)	18,403,928	(106,715,500)	-	(101,140,741)
Assumption Changes	-	-	815,022,527	-	-	-
Benefit Payments	(741,752,669)	(706,303,846)	(670,359,868)	(631,310,997)	(599,475,606)	(573,470,316)
Refunds	(24,010,459)	(23,408,460)	(24,233,277)	(26,344,739)	(26,119,759)	(23,190,984)
<b>Net Change in Total Pension Liability</b>	<b>\$ 480,088,583</b>	<b>\$ 420,068,102</b>	<b>\$ 1,280,459,166</b>	<b>\$ 327,239,769</b>	<b>\$ 435,445,336</b>	<b>\$ 347,167,986</b>
<b>Total Pension Liability - Beginning</b>	<b>\$ 13,171,980,810</b>	<b>\$ 12,751,912,708</b>	<b>\$ 11,471,453,542</b>	<b>\$ 11,144,213,773</b>	<b>\$ 10,708,768,437</b>	<b>\$ 10,361,600,451</b>
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 13,652,069,393</b>	<b>\$ 13,171,980,810</b>	<b>\$ 12,751,912,708</b>	<b>\$ 11,471,453,542</b>	<b>\$ 11,144,213,773</b>	<b>\$ 10,708,768,437</b>
<b>Plan Fiduciary Net Position</b>						
Contributions - Employer	\$ 422,659,079	\$ 366,653,014	\$ 357,481,725	\$ 332,294,226	\$ 328,444,256	\$ 249,835,597
Contributions - Member	217,571,830	213,060,827	207,949,398	204,063,168	199,032,996	196,488,619
Pension Plan Net Investment Income	717,090,294	978,594,418	61,877,808	249,804,954	1,092,585,321	813,797,720
Benefit Payments	(741,752,669)	(706,303,846)	(670,359,868)	(631,310,997)	(599,475,606)	(573,470,316)
Refunds	(24,010,459)	(23,408,460)	(24,233,277)	(26,344,739)	(26,119,759)	(23,190,984)
Pension Plan Administrative Expense	(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	(911,824)	(1,254,518)	(1,263,550)	(1,626,866)	(1,446,882)	(1,804,939)
<b>Net Change in Plan Fiduciary Net Position</b>	<b>\$ 582,878,997</b>	<b>\$ 819,670,608</b>	<b>\$ (75,609,081)</b>	<b>\$ 119,298,431</b>	<b>\$ 985,644,056</b>	<b>\$ 654,657,171</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>\$ 8,253,987,979</b>	<b>\$ 7,434,317,371</b>	<b>\$ 7,509,926,452</b>	<b>\$ 7,390,628,021</b>	<b>\$ 6,404,983,965</b>	<b>\$ 5,750,326,794</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 8,836,866,976</b>	<b>\$ 8,253,987,979</b>	<b>\$ 7,434,317,371</b>	<b>\$ 7,509,926,452</b>	<b>\$ 7,390,628,021</b>	<b>\$ 6,404,983,965</b>
<b>Net Pension Liability - Ending (a) - (b)</b>	<b>\$ 4,815,202,417</b>	<b>\$ 4,917,992,831</b>	<b>\$ 5,317,595,337</b>	<b>\$ 3,961,527,090</b>	<b>\$ 3,753,585,752</b>	<b>\$ 4,303,784,472</b>
<b>Plan Fiduciary Net Position as a Percentage of Total Pension Liability</b>	64.73 %	62.66 %	58.30 %	65.47 %	66.32 %	59.81 %
<b>Covered Employee Payroll*</b>	\$2,752,235,069	\$2,667,611,532	\$2,601,403,606	\$2,575,031,210	\$ 2,507,898,809	\$ 2,501,741,708
<b>Net Pension Liability as a Percentage of Covered Employee Payroll</b>	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%

\* 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%

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

\*\* 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.

## 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** The roll-forward of total pension liability from June 30, 2017 to June 30, 2018 reflects expected service cost and interest reduced by actual benefit payments.

### 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
Salary Increases	5.6% average, including inflation
Municipal Bond Rate	3.62% 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, 2018 can be found in the June 30, 2015 actuarial valuation report.

## Summary of Pension Population Statistics as of June 30, 2017

For purposes of GASB No. 67 disclosures, the System has adopted a roll-forward methodology for accounting purposes. This means that the June 30, 2018 Total Pension Liability is based on a roll-forward of the June 30, 2017 valuation. A brief summary of the June 30, 2017 census data is shown below.

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	35,694
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	2,281
Active Plan Members	47,886
Non-Vested Inactive Members	<u>10,477</u>
Total Plan Members	96,338

Additional information regarding the covered population as of June 30, 2017 may be found in the actuarial valuation report issued October 31, 2017.

## 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 3.62% (based on the June 2018 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, 2018 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, 2018.

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, 2018 (Years 1-50 only)

Year	Payroll for Current Employees	Contributions from Current Employees	Employer Service Cost and Expense Contributions	UAL Contributions	Total Contributions
0	\$ 2,752,235,069				
1	2,716,851,123	\$ 191,488,434	\$ 68,284,678	\$ 361,382,023	\$ 621,155,134
2	2,572,882,764	181,560,881	62,836,900	369,497,046	613,894,827
3	2,440,869,475	172,388,460	57,627,052	380,687,202	610,702,714
4	2,316,433,727	163,707,896	52,685,159	366,774,418	583,167,472
5	2,197,068,125	155,395,581	48,068,465	378,694,586	582,158,632
6	2,081,995,715	147,359,423	43,767,919	391,002,160	582,129,502
7	1,970,021,863	139,519,115	39,717,877	403,709,730	582,946,722
8	1,861,708,436	131,950,025	35,949,175	416,830,297	584,729,496
9	1,757,686,356	124,670,898	32,476,788	430,377,281	587,524,967
10	1,656,475,376	117,579,071	29,220,399	444,364,543	591,164,013
11	1,559,038,373	110,755,942	26,236,944	458,806,391	595,799,277
12	1,463,052,332	104,017,900	23,398,541	473,717,598	601,134,039
13	1,369,990,492	97,442,831	20,757,194	489,113,420	607,313,446
14	1,281,124,263	91,150,304	18,368,214	505,009,606	614,528,124
15	1,195,853,877	85,108,321	16,204,554	521,422,419	622,735,294
16	1,111,375,710	79,124,958	14,167,851	538,368,647	631,661,456
17	1,029,328,820	73,290,711	12,294,037	555,865,628	641,450,377
18	950,140,448	67,668,686	10,595,655	573,931,261	652,195,601
19	874,053,854	62,270,916	9,073,239	592,584,027	663,928,182
20	801,194,520	57,054,252	7,704,797	611,843,008	676,602,056
21	730,799,928	51,964,901	6,451,310	631,727,906	690,144,117
22	661,666,525	46,906,262	5,282,099	-	52,188,361
23	594,182,980	41,891,882	4,198,656	-	46,090,539
24	529,166,620	36,983,830	3,206,593	-	40,190,423
25	468,291,763	32,387,827	2,358,812	-	34,746,640
26	411,772,125	28,190,568	1,654,776	-	29,845,344
27	359,887,025	24,360,934	1,109,768	-	25,470,703
28	312,389,386	20,727,010	865,510	-	21,592,521
29	269,874,591	17,587,333	655,790	-	18,243,123
30	231,758,167	14,863,555	485,031	-	15,348,586
31	197,452,900	12,480,351	351,439	-	12,831,789
32	166,296,489	10,367,510	256,083	-	10,623,593
33	137,735,144	8,473,178	189,597	-	8,662,774
34	111,890,287	6,792,493	142,274	-	6,934,766
35	88,291,885	5,292,216	108,760	-	5,400,976
36	67,445,467	3,992,492	81,890	-	4,074,382
37	49,650,512	2,895,925	67,876	-	2,963,802
38	35,355,337	2,026,972	59,536	-	2,086,508
39	24,395,398	1,372,777	50,455	-	1,423,232
40	16,142,287	889,532	42,199	-	931,731
41	10,194,338	548,047	34,006	-	582,053
42	6,326,064	328,047	30,198	-	358,245
43	3,948,669	195,830	24,940	-	220,770
44	2,379,052	115,411	16,531	-	131,941
45	1,301,018	61,393	9,965	-	71,358
46	637,149	29,225	5,169	-	34,393
47	310,629	14,182	2,245	-	16,427
48	150,889	6,814	895	-	7,710
49	61,737	2,741	402	-	3,143
50	15,464	626	152	-	777

# Single Discount Rate Development

## Projection of Pension Plan Fiduciary Net Position

### Beginning July 1, 2018

#### (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	\$ 8,836,866,976	\$ 621,155,134	\$ 840,084,148	\$ 9,508,979	\$ 632,536,863	\$ 9,240,965,847
2	9,240,965,847	613,894,827	879,933,894	9,005,090	660,174,118	9,626,095,807
3	9,626,095,807	610,702,714	919,771,401	8,543,043	686,579,963	9,995,064,040
4	9,995,064,040	583,167,472	959,649,828	8,107,518	710,944,683	10,321,418,849
5	10,321,418,849	582,158,632	999,270,856	7,689,738	733,173,222	10,629,790,109
6	10,629,790,109	582,129,502	1,036,220,221	7,286,985	754,227,466	10,922,639,871
7	10,922,639,871	582,946,722	1,071,249,644	6,895,077	774,254,538	11,201,696,411
8	11,201,696,411	584,729,496	1,104,542,906	6,515,980	793,377,369	11,468,744,390
9	11,468,744,390	587,524,967	1,136,227,988	6,151,902	811,722,389	11,725,611,855
10	11,725,611,855	591,164,013	1,167,377,065	5,797,664	829,378,106	11,972,979,245
11	11,972,979,245	595,799,277	1,195,189,073	5,456,634	846,498,931	12,214,631,745
12	12,214,631,745	601,134,039	1,222,437,107	5,120,683	863,250,244	12,451,458,239
13	12,451,458,239	607,313,446	1,247,936,196	4,794,967	879,743,681	12,685,784,202
14	12,685,784,202	614,528,124	1,270,505,396	4,483,935	896,196,528	12,921,519,523
15	12,921,519,523	622,735,294	1,290,047,342	4,185,489	912,894,271	13,162,916,257
16	13,162,916,257	631,661,456	1,307,636,534	3,889,815	930,097,525	13,413,148,889
17	13,413,148,889	641,450,377	1,323,306,302	3,602,651	948,040,167	13,675,730,480
18	13,675,730,480	652,195,601	1,336,123,168	3,325,492	967,013,421	13,955,490,842
19	13,955,490,842	663,928,182	1,346,076,841	3,059,188	987,368,889	14,257,651,884
20	14,257,651,884	676,602,056	1,354,322,782	2,804,181	1,009,442,351	14,586,569,328
21	14,586,569,328	690,144,117	1,360,162,383	2,557,800	1,033,571,969	14,947,565,231
22	14,947,565,231	52,188,361	1,363,809,832	2,315,833	1,036,901,605	14,670,529,532
23	14,670,529,532	46,090,539	1,365,359,967	2,079,640	1,016,552,541	14,365,733,006
24	14,365,733,006	40,190,423	1,363,960,580	1,852,083	994,302,601	14,034,413,366
25	14,034,413,366	34,746,640	1,358,916,318	1,639,021	970,275,286	13,678,879,953
26	13,678,879,953	29,845,344	1,349,789,654	1,441,202	944,656,649	13,302,151,090
27	13,302,151,090	25,470,703	1,337,318,393	1,259,605	917,638,641	12,906,682,435
28	12,906,682,435	21,592,521	1,320,984,678	1,093,363	889,416,698	12,495,613,612
29	12,495,613,612	18,243,123	1,300,177,333	944,561	860,241,286	12,072,976,127
30	12,072,976,127	15,348,586	1,275,443,249	811,154	830,382,652	11,642,452,961
31	11,642,452,961	12,831,789	1,247,434,268	691,085	800,081,922	11,207,241,320
32	11,207,241,320	10,623,593	1,217,509,053	582,038	769,520,124	10,769,293,947
33	10,769,293,947	8,662,774	1,186,666,468	482,073	738,801,146	10,329,609,327
34	10,329,609,327	6,934,766	1,155,513,674	391,616	707,975,219	9,888,614,022
35	9,888,614,022	5,400,976	1,124,480,335	309,022	677,056,650	9,446,282,292
36	9,446,282,292	4,074,382	1,093,468,347	236,059	646,047,466	9,002,699,733
37	9,002,699,733	2,963,802	1,062,130,225	173,777	614,966,526	8,558,326,058
38	8,558,326,058	2,086,508	1,029,067,559	123,744	583,897,523	8,115,118,786
39	8,115,118,786	1,423,232	994,113,691	85,384	552,987,647	7,675,330,591
40	7,675,330,591	931,731	957,883,846	56,498	522,376,880	7,240,698,858
41	7,240,698,858	582,053	920,036,011	35,680	492,202,346	6,813,411,566
42	6,813,411,566	358,245	880,513,768	22,141	462,624,143	6,395,858,044
43	6,395,858,044	220,770	840,158,549	13,820	433,784,195	5,989,690,639
44	5,989,690,639	131,941	799,763,448	8,327	405,772,792	5,595,823,597
45	5,595,823,597	71,358	759,643,440	4,554	378,644,312	5,214,891,273
46	5,214,891,273	34,393	719,859,552	2,230	352,442,419	4,847,506,303
47	4,847,506,303	16,427	680,636,523	1,087	327,203,367	4,494,088,488
48	4,494,088,488	7,710	642,173,387	528	302,950,179	4,154,872,461
49	4,154,872,461	3,143	604,550,794	216	279,696,822	3,830,021,417
50	3,830,021,417	777	567,805,586	54	257,453,752	3,519,670,306



# Single Discount Rate Development

## Projection of Pension Plan Fiduciary Net Position

### Beginning July 1, 2018

#### (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	\$ 3,519,670,306	\$ 70	\$ 531,968,890	\$ 5	\$ 236,229,624	\$ 3,223,931,105
52	3,223,931,105	-	497,081,797	-	216,031,060	2,942,880,368
53	2,942,880,368	-	463,184,385	-	196,862,163	2,676,558,146
54	2,676,558,146	-	430,314,840	-	178,724,476	2,424,967,782
55	2,424,967,782	-	398,511,864	-	161,616,862	2,188,072,780
56	2,188,072,780	-	367,813,316	-	145,535,326	1,965,794,791
57	1,965,794,791	-	338,254,488	-	130,472,932	1,758,013,235
58	1,758,013,235	-	309,868,951	-	116,419,742	1,564,564,026
59	1,564,564,026	-	282,690,635	-	103,362,650	1,385,236,042
60	1,385,236,042	-	256,753,594	-	91,285,139	1,219,767,587
61	1,219,767,587	-	232,091,288	-	80,167,043	1,067,843,343
62	1,067,843,343	-	208,734,548	-	69,984,403	929,093,198
63	929,093,198	-	186,710,612	-	60,709,417	803,092,003
64	803,092,003	-	166,042,097	-	52,310,455	689,360,360
65	689,360,360	-	146,746,710	-	44,752,131	587,365,780
66	587,365,780	-	128,834,762	-	37,995,471	496,526,490
67	496,526,490	-	112,308,437	-	31,998,220	416,216,274
68	416,216,274	-	97,159,888	-	26,715,257	345,771,642
69	345,771,642	-	83,370,554	-	22,099,138	284,500,227
70	284,500,227	-	70,911,546	-	18,100,698	231,689,378
71	231,689,378	-	59,744,162	-	14,669,646	186,614,863
72	186,614,863	-	49,820,775	-	11,755,173	148,549,260
73	148,549,260	-	41,086,223	-	9,306,504	116,769,542
74	116,769,542	-	33,478,379	-	7,273,434	90,564,596
75	90,564,596	-	26,928,507	-	5,606,854	69,242,944
76	69,242,944	-	21,360,855	-	4,259,330	52,141,419
77	52,141,419	-	16,693,243	-	3,185,710	38,633,887
78	38,633,887	-	12,838,621	-	2,343,700	28,138,965
79	28,138,965	-	9,706,912	-	1,694,356	20,126,409
80	20,126,409	-	7,207,109	-	1,202,478	14,121,778
81	14,121,778	-	5,248,883	-	836,886	9,709,781
82	9,709,781	-	3,745,443	-	570,562	6,534,901
83	6,534,901	-	2,615,387	-	380,631	4,300,144
84	4,300,144	-	1,784,562	-	248,202	2,763,784
85	2,763,784	-	1,188,045	-	158,061	1,733,800
86	1,733,800	-	770,886	-	98,245	1,061,159
87	1,061,159	-	487,274	-	59,579	633,464
88	633,464	-	299,969	-	35,243	368,738
89	368,738	-	179,968	-	20,324	209,095
90	209,095	-	105,198	-	11,413	115,309
91	115,309	-	59,871	-	6,228	61,665
92	61,665	-	33,070	-	3,293	31,889
93	31,889	-	17,711	-	1,681	15,858
94	15,858	-	9,173	-	823	7,508
95	7,508	-	4,484	-	385	3,409
96	3,409	-	2,048	-	174	1,535
97	1,535	-	938	-	78	674
98	674	-	448	-	33	259
99	259	-	268	-	9	0
100	0	-	-	-	0	0

# Single Discount Rate Development

## Present Values of Projected Pension Benefit Payments

### Beginning July 1, 2018

#### (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 <sup>(a)-.5</sup>	(g)=(e)*vf <sup>(a)-.5</sup>	(h)=(c)/(1+sdr) <sup>(a)-.5</sup>
1	\$ 8,836,866,976	\$ 840,084,148	\$ 840,084,148	\$ -	\$ 811,192,897	\$ -	\$ 811,192,897
2	9,240,965,847	879,933,894	879,933,894	-	792,235,128	-	792,235,128
3	9,626,095,807	919,771,401	919,771,401	-	772,123,285	-	772,123,285
4	9,995,064,040	959,649,828	959,649,828	-	751,142,330	-	751,142,330
5	10,321,418,849	999,270,856	999,270,856	-	729,281,787	-	729,281,787
6	10,629,790,109	1,036,220,221	1,036,220,221	-	705,126,291	-	705,126,291
7	10,922,639,871	1,071,249,644	1,071,249,644	-	679,685,860	-	679,685,860
8	11,201,696,411	1,104,542,906	1,104,542,906	-	653,435,664	-	653,435,664
9	11,468,744,390	1,136,227,988	1,136,227,988	-	626,741,461	-	626,741,461
10	11,725,611,855	1,167,377,065	1,167,377,065	-	600,394,629	-	600,394,629
11	11,972,979,245	1,195,189,073	1,195,189,073	-	573,145,590	-	573,145,590
12	12,214,631,745	1,222,437,107	1,222,437,107	-	546,584,818	-	546,584,818
13	12,451,458,239	1,247,936,196	1,247,936,196	-	520,266,809	-	520,266,809
14	12,685,784,202	1,270,505,396	1,270,505,396	-	493,870,348	-	493,870,348
15	12,921,519,523	1,290,047,342	1,290,047,342	-	467,568,005	-	467,568,005
16	13,162,916,257	1,307,636,534	1,307,636,534	-	441,904,966	-	441,904,966
17	13,413,148,889	1,323,306,302	1,323,306,302	-	416,970,103	-	416,970,103
18	13,675,730,480	1,336,123,168	1,336,123,168	-	392,548,868	-	392,548,868
19	13,955,490,842	1,346,076,841	1,346,076,841	-	368,739,605	-	368,739,605
20	14,257,651,884	1,354,322,782	1,354,322,782	-	345,919,319	-	345,919,319
21	14,586,569,328	1,360,162,383	1,360,162,383	-	323,926,212	-	323,926,212
22	14,947,565,231	1,363,809,832	1,363,809,832	-	302,839,031	-	302,839,031
23	14,670,529,532	1,365,359,967	1,365,359,967	-	282,688,340	-	282,688,340
24	14,365,733,006	1,363,960,580	1,363,960,580	-	263,308,724	-	263,308,724
25	14,034,413,366	1,358,916,318	1,358,916,318	-	244,601,346	-	244,601,346
26	13,678,879,953	1,349,789,654	1,349,789,654	-	226,534,798	-	226,534,798
27	13,302,151,090	1,337,318,393	1,337,318,393	-	209,269,697	-	209,269,697
28	12,906,682,435	1,320,984,678	1,320,984,678	-	192,740,068	-	192,740,068
29	12,495,613,612	1,300,177,333	1,300,177,333	-	176,880,320	-	176,880,320
30	12,072,976,127	1,275,443,249	1,275,443,249	-	161,785,935	-	161,785,935
31	11,642,452,961	1,247,434,268	1,247,434,268	-	147,536,676	-	147,536,676
32	11,207,241,320	1,217,509,053	1,217,509,053	-	134,263,271	-	134,263,271
33	10,769,293,947	1,186,666,468	1,186,666,468	-	122,015,890	-	122,015,890
34	10,329,609,327	1,155,513,674	1,155,513,674	-	110,781,058	-	110,781,058
35	9,888,614,022	1,124,480,335	1,124,480,335	-	100,518,265	-	100,518,265
36	9,446,282,292	1,093,468,347	1,093,468,347	-	91,138,533	-	91,138,533
37	9,002,699,733	1,062,130,225	1,062,130,225	-	82,542,247	-	82,542,247
38	8,558,326,058	1,029,067,559	1,029,067,559	-	74,566,731	-	74,566,731
39	8,115,118,786	994,113,691	994,113,691	-	67,164,529	-	67,164,529
40	7,675,330,591	957,883,846	957,883,846	-	60,341,967	-	60,341,967
41	7,240,698,858	920,036,011	920,036,011	-	54,039,851	-	54,039,851
42	6,813,411,566	880,513,768	880,513,768	-	48,222,327	-	48,222,327
43	6,395,858,044	840,158,549	840,158,549	-	42,901,845	-	42,901,845
44	5,989,690,639	799,763,448	799,763,448	-	38,078,424	-	38,078,424
45	5,595,823,597	759,643,440	759,643,440	-	33,723,287	-	33,723,287
46	5,214,891,273	719,859,552	719,859,552	-	29,796,866	-	29,796,866
47	4,847,506,303	680,636,523	680,636,523	-	26,268,832	-	26,268,832
48	4,494,088,488	642,173,387	642,173,387	-	23,108,966	-	23,108,966
49	4,154,872,461	604,550,794	604,550,794	-	20,284,472	-	20,284,472
50	3,830,021,417	567,805,586	567,805,586	-	17,763,693	-	17,763,693

# Single Discount Rate Development

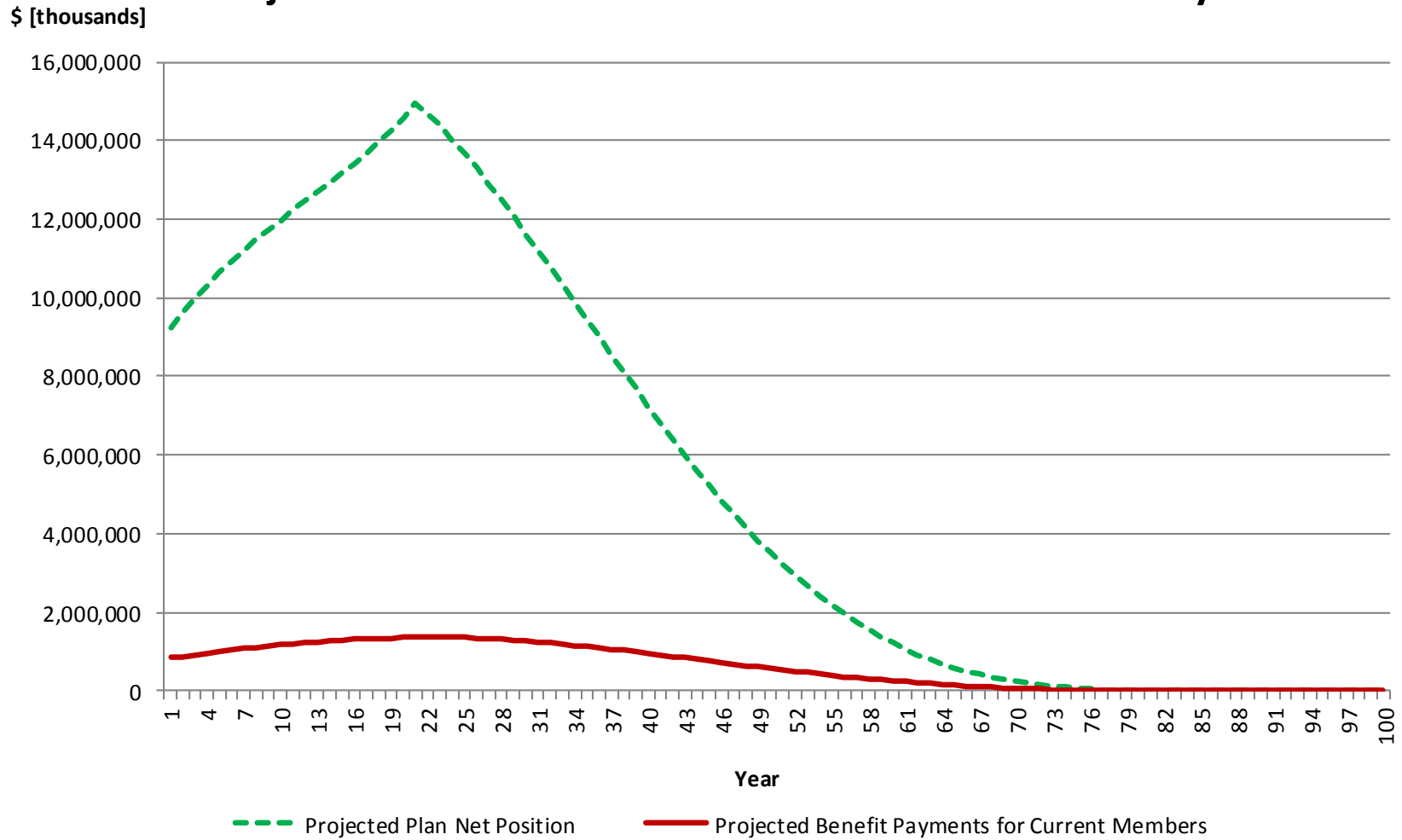
## Present Values of Projected Pension Benefit Payments

### Beginning July 1, 2018 (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 <sup>n</sup> /(a)-.5)	(g)=(e)*vf <sup>n</sup> /(a)-.5)	(h)=((c)/(1+s dr) <sup>n</sup> /(a)-.5)
51	\$ 3,519,670,306	\$531,968,890	\$ 531,968,890	\$ -	\$ 15,517,528	\$ -	\$ 15,517,528
52	3,223,931,105	497,081,797	497,081,797	-	13,519,694	-	13,519,694
53	2,942,880,368	463,184,385	463,184,385	-	11,746,152	-	11,746,152
54	2,676,558,146	430,314,840	430,314,840	-	10,174,914	-	10,174,914
55	2,424,967,782	398,511,864	398,511,864	-	8,785,943	-	8,785,943
56	2,188,072,780	367,813,316	367,813,316	-	7,560,965	-	7,560,965
57	1,965,794,791	338,254,488	338,254,488	-	6,483,299	-	6,483,299
58	1,758,013,235	309,868,951	309,868,951	-	5,537,749	-	5,537,749
59	1,564,564,026	282,690,635	282,690,635	-	4,710,525	-	4,710,525
60	1,385,236,042	256,753,594	256,753,594	-	3,989,120	-	3,989,120
61	1,219,767,587	232,091,288	232,091,288	-	3,362,189	-	3,362,189
62	1,067,843,343	208,734,548	208,734,548	-	2,819,424	-	2,819,424
63	929,093,198	186,710,612	186,710,612	-	2,351,461	-	2,351,461
64	803,092,003	166,042,097	166,042,097	-	1,949,798	-	1,949,798
65	689,360,360	146,746,710	146,746,710	-	1,606,728	-	1,606,728
66	587,365,780	128,834,762	128,834,762	-	1,315,255	-	1,315,255
67	496,526,490	112,308,437	112,308,437	-	1,069,035	-	1,069,035
68	416,216,274	97,159,888	97,159,888	-	862,321	-	862,321
69	345,771,642	83,370,554	83,370,554	-	689,918	-	689,918
70	284,500,227	70,911,546	70,911,546	-	547,148	-	547,148
71	231,689,378	59,744,162	59,744,162	-	429,819	-	429,819
72	186,614,863	49,820,775	49,820,775	-	334,198	-	334,198
73	148,549,260	41,086,223	41,086,223	-	256,976	-	256,976
74	116,769,542	33,478,379	33,478,379	-	195,237	-	195,237
75	90,564,596	26,928,507	26,928,507	-	146,424	-	146,424
76	69,242,944	21,360,855	21,360,855	-	108,298	-	108,298
77	52,141,419	16,693,243	16,693,243	-	78,913	-	78,913
78	38,633,887	12,838,621	12,838,621	-	56,588	-	56,588
79	28,138,965	9,706,912	9,706,912	-	39,893	-	39,893
80	20,126,409	7,207,109	7,207,109	-	27,617	-	27,617
81	14,121,778	5,248,883	5,248,883	-	18,754	-	18,754
82	9,709,781	3,745,443	3,745,443	-	12,477	-	12,477
83	6,534,901	2,615,387	2,615,387	-	8,124	-	8,124
84	4,300,144	1,784,562	1,784,562	-	5,168	-	5,168
85	2,763,784	1,188,045	1,188,045	-	3,208	-	3,208
86	1,733,800	770,886	770,886	-	1,941	-	1,941
87	1,061,159	487,274	487,274	-	1,144	-	1,144
88	633,464	299,969	299,969	-	657	-	657
89	368,738	179,968	179,968	-	367	-	367
90	209,095	105,198	105,198	-	200	-	200
91	115,309	59,871	59,871	-	106	-	106
92	61,665	33,070	33,070	-	55	-	55
93	31,889	17,711	17,711	-	27	-	27
94	15,858	9,173	9,173	-	13	-	13
95	7,508	4,484	4,484	-	6	-	6
96	3,409	2,048	2,048	-	3	-	3
97	1,535	938	938	-	1	-	1
98	674	448	448	-	-	-	-
99	259	83	83	-	-	-	-
100	-	-	-	-	-	-	-
<b>Totals</b>					<b>\$ 15,504,835,344</b>	<b>\$ -</b>	<b>\$ 15,504,835,344</b>

## 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%

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, 2018 OPEB

## Assets

Cash and Deposits		\$ 1,076,413
Receivables		
Accounts Receivable - Sale of Investments		\$ 64,265
Accrued Interest and Other Dividends		63,232
Contributions		4,784,230
Accounts Receivable - Other		16,563
Total Receivables		<u>\$ 4,928,290</u>
Investments		
Fixed Income		\$ 6,773,862
Domestic Equities		10,918,362
International Equities		4,738,938
Real Estate		2,975,420
Other		6,037,840
Total Investments		<u>\$ 31,444,422</u>
<b>Total Assets</b>		<b><u>\$ 37,449,125</u></b>

## Liabilities

Payables		
Accounts Payable - Purchase of Investments		\$ 104,057
Accrued Expenses		-
Accounts Payable - Other		36,809
<b>Total Liabilities</b>		<b><u>\$ 140,866</u></b>

<b>Net Position Restricted for OPEB</b>	<b><u>\$ 37,308,259</u></b>
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# Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2018 OPEB

## Additions

Contributions	
Employer	\$ 44,194,281
Nonemployer contributing entities	0
Active Employees	0
Other	0
Total Contributions	<u>\$ 44,194,281</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 2,705,963
Interest and Dividends	544,477
Less Investment Expense	<u>(121,962)</u>
Net Investment Income	<u>\$ 3,128,478</u>
Other	<u>\$ 0</u>
<b>Total Additions</b>	<b><u>\$ 47,322,759</u></b>

## Deductions

Benefit Payments	\$ 49,250,676
OPEB Plan Administrative Expense	33,144
Other	<u>3,881</u>
<b>Total Deductions</b>	<b><u>\$ 49,287,701</u></b>
<b>Net Increase in Net Position</b>	<b>\$ (1,964,942)</b>

## Net Position Restricted for OPEB

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

**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 %

\* 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 %

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

\*\* 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.

## 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
Salary Increases	5.6% average, including inflation
Municipal Bond Rate	3.62% 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, 2017

For purposes of GASB No. 74 disclosures, the System has adopted a roll-forward methodology for accounting purposes. This means that the June 30, 2018 Total OPEB Liability is based on a roll-forward of the June 30, 2017 valuation. A brief summary of the June 30, 2017 census data is shown below.

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	10,005
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	-
Active Plan Members	<u>2,646</u>
Total Plan Members	12,651

Additional information regarding the covered population as of June 30, 2017 may be found in the actuarial valuation report issued October 31, 2017.

## 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 3.62%; 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, 2018 (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	\$ 37,308,259	\$ 45,112,323	\$ 49,956,896	\$ 36,321	\$ 2,531,012	\$ 34,958,377
2	34,958,377	46,034,054	49,583,499	34,808	2,406,826	33,780,949
3	33,780,949	23,744,871	49,222,932	33,366	1,540,510	9,810,032
4	9,810,032	48,031,377	48,771,885	31,913	683,717	9,721,327
5	9,721,327	47,327,693	48,105,107	30,439	676,024	9,589,499
6	9,589,499	46,421,540	47,231,200	28,949	665,371	9,416,260
7	9,416,260	45,301,521	46,142,101	27,417	651,764	9,200,027
8	9,200,027	44,041,688	44,898,501	25,870	635,565	8,952,908
9	8,952,908	42,622,400	43,494,446	24,346	617,160	8,673,677
10	8,673,677	41,142,457	42,011,681	22,840	597,070	8,378,683
11	8,378,683	39,578,042	40,444,435	21,317	575,838	8,066,811
12	8,066,811	37,916,495	38,781,129	19,808	553,344	7,735,713
13	7,735,713	36,189,696	37,046,445	18,360	529,672	7,390,275
14	7,390,275	34,423,302	35,266,129	16,964	505,173	7,035,657
15	7,035,657	32,638,941	33,462,785	15,594	480,188	6,676,407
16	6,676,407	30,818,166	31,624,901	14,234	454,800	6,310,240
17	6,310,240	29,003,225	29,785,901	12,873	429,158	5,943,849
18	5,943,849	27,215,008	27,969,107	11,486	403,662	5,581,926
19	5,581,926	25,437,207	26,164,921	10,049	378,414	5,222,577
20	5,222,577	23,686,881	24,385,996	8,574	353,432	4,868,320
21	4,868,320	21,999,750	22,664,458	7,168	329,024	4,525,468
22	4,525,468	20,354,803	20,988,174	5,925	305,327	4,191,499
23	4,191,499	18,805,281	19,399,580	4,841	282,545	3,874,903
24	3,874,903	17,345,784	17,901,520	3,919	260,998	3,576,246
25	3,576,246	15,962,362	16,482,792	3,155	240,630	3,293,291
26	3,293,291	14,690,667	15,171,336	2,528	221,554	3,031,649
27	3,031,649	13,516,500	13,960,119	2,018	203,923	2,789,934
28	2,789,934	12,431,968	12,841,327	1,602	187,634	2,566,606
29	2,566,606	11,431,007	11,808,539	1,263	172,588	2,360,400
30	2,360,400	10,507,789	10,855,770	990	158,700	2,170,128
31	2,170,128	9,656,042	9,976,736	771	145,885	1,994,548
32	1,994,548	8,874,166	9,169,015	597	134,082	1,833,185
33	1,833,185	8,154,092	8,425,432	458	123,226	1,684,613
34	1,684,613	7,489,705	7,739,626	347	113,221	1,547,566
35	1,547,566	6,877,589	7,107,633	261	103,996	1,421,256
36	1,421,256	6,313,067	6,524,851	195	95,491	1,304,769
37	1,304,769	5,791,541	5,986,631	143	87,642	1,197,178
38	1,197,178	5,308,583	5,488,458	104	80,385	1,097,584
39	1,097,584	4,860,006	5,026,043	74	73,659	1,005,132
40	1,005,132	4,442,093	4,595,526	52	67,406	919,051
41	919,051	4,051,589	4,193,514	36	61,575	838,666
42	838,666	3,685,824	3,817,179	24	56,124	763,411
43	763,411	3,342,636	3,464,220	16	51,016	692,828
44	692,828	3,020,349	3,132,834	10	46,223	626,557
45	626,557	2,717,734	2,821,678	6	41,723	564,330
46	564,330	2,433,953	2,529,819	3	37,499	505,960
47	505,960	2,168,469	2,256,642	2	33,542	451,327
48	451,327	1,920,944	2,001,761	1	29,843	400,351
49	400,351	1,691,158	1,764,923	0	26,398	352,984
50	352,984	1,478,942	1,545,943	0	23,205	309,188

# Single Discount Rate Development

## Projection of OPEB Plan Net Position Beginning July 1, 2018 (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	\$ 309,188	\$ 1,284,104	\$ 1,344,628	\$ 0	\$ 20,261	\$ 268,925
52	268,925	1,106,410	1,160,748	0	17,562	232,150
53	232,150	945,498	993,960	0	15,105	198,792
54	198,792	800,924	843,834	0	12,884	168,767
55	168,767	672,157	709,848	0	10,893	141,970
56	141,970	558,546	591,367	0	9,124	118,273
57	118,273	459,323	487,636	0	7,566	97,527
58	97,527	373,605	397,785	0	6,210	79,557
59	79,557	300,418	320,846	0	5,040	64,169
60	64,169	238,717	255,776	0	4,045	51,155
61	51,155	187,402	201,470	0	3,208	40,294
62	40,294	145,331	156,782	0	2,513	31,356
63	31,356	111,357	120,550	0	1,946	24,110
64	24,110	84,355	91,628	0	1,489	18,326
65	18,326	63,249	68,918	0	1,127	13,784
66	13,784	47,033	51,384	0	844	10,277
67	10,277	34,792	38,081	0	628	7,616
68	7,616	25,716	28,165	0	465	5,633
69	5,633	19,107	20,903	0	344	4,181
70	4,181	14,375	15,677	0	257	3,135
71	3,135	11,043	11,977	0	194	2,395
72	2,395	8,727	9,394	0	150	1,879
73	1,879	7,131	7,608	0	119	1,522
74	1,522	6,032	6,377	0	98	1,275
75	1,275	5,267	5,522	0	83	1,104
76	1,104	4,721	4,916	0	73	983
77	983	4,316	4,470	0	66	894
78	894	3,998	4,127	0	60	825
79	825	3,736	3,848	0	56	770
80	770	3,507	3,608	0	52	722
81	722	3,301	3,393	0	49	679
82	679	3,109	3,195	0	46	639
83	639	2,928	3,008	0	43	602
84	602	2,751	2,828	0	41	566
85	566	2,577	2,651	0	38	530
86	530	2,405	2,476	0	36	495
87	495	2,234	2,302	0	33	460
88	460	2,065	2,130	0	31	426
89	426	1,899	1,962	0	29	392
90	392	1,738	1,797	0	26	359
91	359	1,580	1,637	0	24	327
92	327	1,429	1,482	0	22	296
93	296	1,284	1,334	0	20	267
94	267	1,146	1,192	0	18	238
95	238	1,013	1,056	0	16	211
96	211	884	924	0	14	185
97	185	761	798	0	12	160
98	160	644	678	0	10	136
99	136	535	566	0	9	113
100	113	436	463	0	7	93

# Single Discount Rate Development

## Present Values of Projected OPEB Benefits Beginning July 1, 2018

(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 <sup>(a)-5</sup>	(g)=(e)*vf <sup>(a)-5</sup>	(h)=(c)/(1+SDR) <sup>(a)-5</sup>
1	\$ 37,308,259	\$ 49,956,896	\$ 49,956,896	\$ 0	\$ 48,238,834	\$ 0	\$ 48,238,834
2	34,958,377	49,583,499	49,583,499	0	44,641,751	0	44,641,751
3	33,780,949	49,222,932	49,222,932	0	41,321,324	0	41,321,324
4	9,810,032	48,771,885	48,771,885	0	38,174,995	0	38,174,995
5	9,721,327	48,105,107	48,105,107	0	35,107,777	0	35,107,777
6	9,589,499	47,231,200	47,231,200	0	32,139,849	0	32,139,849
7	9,416,260	46,142,101	46,142,101	0	29,276,214	0	29,276,214
8	9,200,027	44,898,501	44,898,501	0	26,561,469	0	26,561,469
9	8,952,908	43,494,446	43,494,446	0	23,991,464	0	23,991,464
10	8,673,677	42,011,681	42,011,681	0	21,607,061	0	21,607,061
11	8,378,683	40,444,435	40,444,435	0	19,394,881	0	19,394,881
12	8,066,811	38,781,129	38,781,129	0	17,340,096	0	17,340,096
13	7,735,713	37,046,445	37,046,445	0	15,444,728	0	15,444,728
14	7,390,275	35,266,129	35,266,129	0	13,708,635	0	13,708,635
15	7,035,657	33,462,785	33,462,785	0	12,128,336	0	12,128,336
16	6,676,407	31,624,901	31,624,901	0	10,687,374	0	10,687,374
17	6,310,240	29,785,901	29,785,901	0	9,385,454	0	9,385,454
18	5,943,849	27,969,107	27,969,107	0	8,217,237	0	8,217,237
19	5,581,926	26,164,921	26,164,921	0	7,167,527	0	7,167,527
20	5,222,577	24,385,996	24,385,996	0	6,228,639	0	6,228,639
21	4,868,320	22,664,458	22,664,458	0	5,397,600	0	5,397,600
22	4,525,468	20,988,174	20,988,174	0	4,660,502	0	4,660,502
23	4,191,499	19,399,580	19,399,580	0	4,016,549	0	4,016,549
24	3,874,903	17,901,520	17,901,520	0	3,455,838	0	3,455,838
25	3,576,246	16,482,792	16,482,792	0	2,966,859	0	2,966,859
26	3,293,291	15,171,336	15,171,336	0	2,546,201	0	2,546,201
27	3,031,649	13,960,119	13,960,119	0	2,184,543	0	2,184,543
28	2,789,934	12,841,327	12,841,327	0	1,873,631	0	1,873,631
29	2,566,606	11,808,539	11,808,539	0	1,606,472	0	1,606,472
30	2,360,400	10,855,770	10,855,770	0	1,377,020	0	1,377,020
31	2,170,128	9,976,736	9,976,736	0	1,179,970	0	1,179,970
32	1,994,548	9,169,015	9,169,015	0	1,011,132	0	1,011,132
33	1,833,185	8,425,432	8,425,432	0	866,323	0	866,323
34	1,684,613	7,739,626	7,739,626	0	742,011	0	742,011
35	1,547,566	7,107,633	7,107,633	0	635,357	0	635,357
36	1,421,256	6,524,851	6,524,851	0	543,834	0	543,834
37	1,304,769	5,986,631	5,986,631	0	465,244	0	465,244
38	1,197,178	5,488,458	5,488,458	0	397,696	0	397,696
39	1,097,584	5,026,043	5,026,043	0	339,571	0	339,571
40	1,005,132	4,595,526	4,595,526	0	289,496	0	289,496
41	919,051	4,193,514	4,193,514	0	246,313	0	246,313
42	838,666	3,817,179	3,817,179	0	209,052	0	209,052
43	763,411	3,464,220	3,464,220	0	176,897	0	176,897
44	692,828	3,132,834	3,132,834	0	149,161	0	149,161
45	626,557	2,821,678	2,821,678	0	125,264	0	125,264
46	564,330	2,529,819	2,529,819	0	104,716	0	104,716
47	505,960	2,256,642	2,256,642	0	87,094	0	87,094
48	451,327	2,001,761	2,001,761	0	72,034	0	72,034
49	400,351	1,764,923	1,764,923	0	59,218	0	59,218
50	352,984	1,545,943	1,545,943	0	48,365	0	48,365



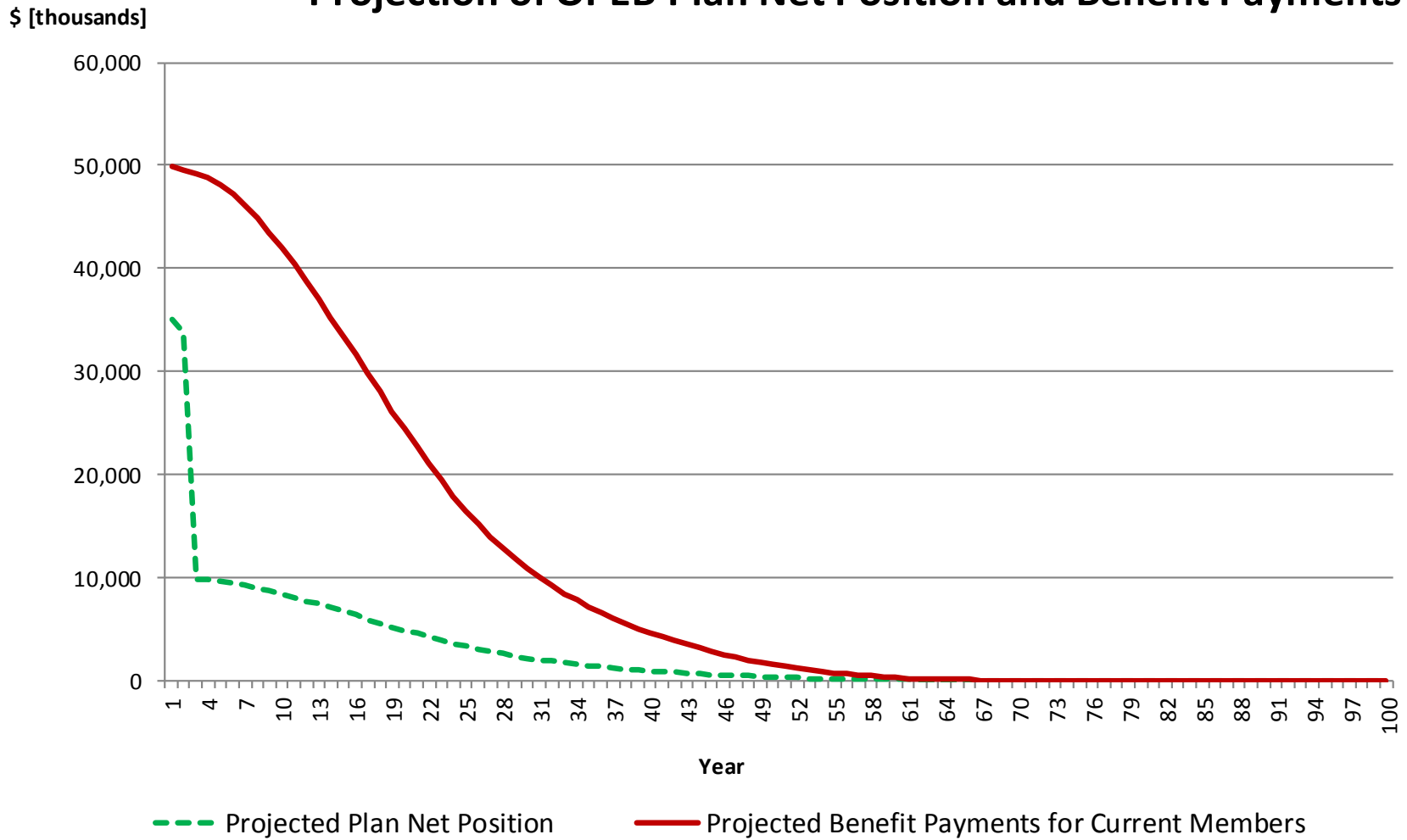
# Single Discount Rate Development

## Present Values of Projected OPEB Benefits Beginning July 1, 2018

### (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 <sup>((a)-.5)</sup>	(g)=(e)*vf <sup>^(a)-.5)</sup>	(h)=(c)/(1+SDR) <sup>^(a)-.5)</sup>
51	\$ 309,188	\$ 1,344,628	\$ 1,344,628	\$ 0	\$ 39,223	\$ 0	\$ 39,223
52	268,925	1,160,748	1,160,748	0	31,570	0	31,570
53	232,150	993,960	993,960	0	25,206	0	25,206
54	198,792	843,834	843,834	0	19,953	0	19,953
55	168,767	709,848	709,848	0	15,650	0	15,650
56	141,970	591,367	591,367	0	12,156	0	12,156
57	118,273	487,636	487,636	0	9,346	0	9,346
58	97,527	397,785	397,785	0	7,109	0	7,109
59	79,557	320,846	320,846	0	5,346	0	5,346
60	64,169	255,776	255,776	0	3,974	0	3,974
61	51,155	201,470	201,470	0	2,919	0	2,919
62	40,294	156,782	156,782	0	2,118	0	2,118
63	31,356	120,550	120,550	0	1,518	0	1,518
64	24,110	91,628	91,628	0	1,076	0	1,076
65	18,326	68,918	68,918	0	755	0	755
66	13,784	51,384	51,384	0	525	0	525
67	10,277	38,081	38,081	0	362	0	362
68	7,616	28,165	28,165	0	250	0	250
69	5,633	20,903	20,903	0	173	0	173
70	4,181	15,677	15,677	0	121	0	121
71	3,135	11,977	11,977	0	86	0	86
72	2,395	9,394	9,394	0	63	0	63
73	1,879	7,608	7,608	0	48	0	48
74	1,522	6,377	6,377	0	37	0	37
75	1,275	5,522	5,522	0	30	0	30
76	1,104	4,916	4,916	0	25	0	25
77	983	4,470	4,470	0	21	0	21
78	894	4,127	4,127	0	18	0	18
79	825	3,848	3,848	0	16	0	16
80	770	3,608	3,608	0	14	0	14
81	722	3,393	3,393	0	12	0	12
82	679	3,195	3,195	0	11	0	11
83	639	3,008	3,008	0	9	0	9
84	602	2,828	2,828	0	8	0	8
85	566	2,651	2,651	0	7	0	7
86	530	2,476	2,476	0	6	0	6
87	495	2,302	2,302	0	5	0	5
88	460	2,130	2,130	0	5	0	5
89	426	1,962	1,962	0	4	0	4
90	392	1,797	1,797	0	3	0	3
91	359	1,637	1,637	0	3	0	3
92	327	1,482	1,482	0	2	0	2
93	296	1,334	1,334	0	2	0	2
94	267	1,192	1,192	0	2	0	2
95	238	1,056	1,056	0	1	0	1
96	211	924	924	0	1	0	1
97	185	798	798	0	1	0	1
98	160	678	678	0	1	0	1
99	136	566	566	0	1	0	1
100	113	1	0	1	0	0	0
<b>Totals</b>	<b>\$ 498,777,401</b>	<b>\$ 0</b>	<b>\$ 498,777,401</b>	<b>\$ 0</b>	<b>\$ 498,777,401</b>	<b>\$ 0</b>	<b>\$ 498,777,401</b>

## Projection of OPEB Plan Net Position and Benefit Payments



## SECTION C

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### ACTUARIAL SECTION

## Summary of Changes from June 30, 2017 to June 30, 2018 (\$ in Millions)

	Pension				
	Employees	Teachers	Police	Fire	Total
<b>Reconciliation of UAAL</b>					
Expected	\$1,604.6	\$2,181.2	\$870.6	\$378.0	\$5,034.4
Impact of (Gain)Loss	(33.2)	9.9	(12.3)	(6.6)	(42.2)
Impact of Assumption 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	\$1,571.4	\$2,191.1	\$858.3	\$371.4	\$4,992.2
<b>Funded %</b>					
Prior Valuation	63.0 %	57.7 %	65.4 %	67.9 %	61.8 %
Expected Change	1.2 %	1.7 %	1.3 %	1.2 %	1.5 %
Impact of Gain(Loss)	0.8 %	(0.2)%	0.5 %	0.6 %	0.3 %
Impact of Assumption 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	65.0 %	59.2 %	67.2 %	69.7 %	63.6 %

	Medical Subsidy				
	State Employees	Political Subdivision Employees	Teachers	Police & Fire	Total
<b>Reconciliation of UAAL</b>					
Expected	\$60.6	\$34.5	\$223.9	\$317.5	\$636.5
Impact of (Gain)Loss	0.5	2.2	11.9	1.7	16.3
Impact of Assumption 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	\$61.1	\$36.7	\$235.8	\$319.2	\$652.8

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

The pension funded percent of 63.6% is the ratio of the actuarial value of assets to the actuarial accrued liability for NHRS in total. That ratio is 64.5% 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:	2016	2017	2018	2019	2020	2021	2022
A. Funding Value Beginning of Year	\$ 7,300,276,091	\$ 7,663,416,136	\$ 8,204,537,196				
B. Market Value End of Year	7,460,944,677	8,293,261,180	8,874,175,235				
C. Market Value Beginning of Year	7,530,056,191	7,460,944,677	8,293,261,180				
D. Non-Investment Net Cash Flow*	(131,267,165)	(150,426,632)	(139,877,807)				
E. Investment Income							
E1. Market Total: B - C - D	62,155,651	982,743,135	720,791,862				
E2. Assumed Rate	7.25%	7.25%	7.25%				
E3. Amount for Immediate Recognition	524,511,582	550,144,704	589,758,376				
E4. Amount for Phased-In Recognition: E1-E3	(462,355,931)	432,598,431	131,033,486				
F. Phased-In Recognition of Investment Income							
F1. Current Year: 0.20 x E4	(92,471,186)	86,519,686	26,206,697				
F2. First Prior Year	(52,984,178)	(92,471,186)	86,519,686	\$ 26,206,697			
F3. Second Prior Year	126,027,156	(52,984,178)	(92,471,186)	86,519,686	\$ 26,206,697		
F4. Third Prior Year	74,311,509	126,027,156	(52,984,178)	(92,471,186)	86,519,686	\$ 26,206,697	
F5. Fourth Prior Year	(84,987,673)	74,311,510	126,027,155	(52,984,179)	(92,471,187)	86,519,687	\$ 26,206,698
F6. Total Recognized Investment Gain	(30,104,372)	141,402,988	93,298,174	(32,728,982)	20,255,196	112,726,384	26,206,698
G. Preliminary Funding Value End of Year: A + D + E3 + F6	\$ 7,663,416,136	\$ 8,204,537,196	\$ 8,747,715,939				
H. Additional Recognized G/L due to Corridor	-	-	-				
I. Final Funding Value after 20% Corridor	\$ 7,663,416,136	\$ 8,204,537,196	\$ 8,747,715,939				
J. Difference between Market & Funding Value: B-I	\$ (202,471,459)	\$ 88,723,984	\$ 126,459,296				
K. Recognized Rate of Return	6.83%	9.11%	8.40%				
L. Market Rate of Return	0.83%	13.31%	8.77%				
M. Ratio of Funding Value to Market Value	102.71%	98.93%	98.57%				

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.*

## Allocation of Assets

	Employees	Teachers	Police	Fire	Total
Allocated Fund Assets (Actuarial Value)	\$2,941,214,706	\$3,181,893,758	\$1,768,064,600	\$856,542,875	\$8,747,715,939
Less Reserve for TSAs	-	-	-	-	-
Less 401(h) Account	18,856,924	4,961,263	9,763,889	3,194,531	36,776,607
Net Pension Valuation Assets	\$2,922,357,782	\$3,176,932,495	\$1,758,300,711	\$853,348,344	\$8,710,939,332

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, 2018

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	\$ 6,323,008,555	\$ 1,176,155,749	\$ 5,146,852,806
Disability benefits likely to be paid to present active members	251,046,532	128,585,602	122,460,930
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	77,521,137	35,846,697	41,674,440
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	1,121,428,803	699,158,044	422,270,759
Benefits likely to be paid to current inactive and vested deferred members	302,441,673	-	302,441,673
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	7,667,448,083	-	7,667,448,083
<b>Total</b>	<b>\$ 15,742,894,783</b>	<b>\$ 2,039,746,092</b>	<b>\$ 13,703,148,691</b>
Actuarial Value of Assets	\$ 8,710,939,332	-	\$ 8,710,939,332
Liabilities to be Covered by Future Contributions	\$ 7,031,955,451	\$ 2,039,746,092	\$ 4,992,209,359
Funded Ratio			63.6%

## Actuarial Balance Sheet as of June 30, 2018

### Assets and Present Value of Expected Future Contributions

	Pension	Medical Subsidy
A. Present valuation assets		
1. Net assets from system financial statements	\$ 8,836,866,976	\$ 37,308,259
2. Funding value adjustment	(125,927,644)	(531,652)
3. Valuation assets	8,710,939,332	36,776,607
B. Actuarial present value of expected future employer contributions		
1. For normal costs	378,895,264	9,523,371
2. For unfunded actuarial accrued liability	4,992,209,359	652,800,203
3. Total	5,371,104,623	662,323,574
C. Actuarial present value of expected future member contributions	1,660,850,828	-
D. Total Present and Expected Future Resources	\$ 15,742,894,783	\$ 699,100,181

### Present Value of Expected Future Benefit Payments

A. To retirees and beneficiaries	\$ 7,667,448,083	\$ 576,261,391
B. To vested terminated members	219,301,350	-
C. To non-vested terminated members (outstanding refunds)	83,140,323	-
D. To present active members		
1. Allocated to service rendered prior to valuation date - actuarial accrued liability	5,733,258,935	113,315,419
2. Allocated to service likely to be rendered after valuation date	2,039,746,092	9,523,371
3. Total	7,773,005,027	122,838,790
E. Total Actuarial Present Value of Expected Future Benefit Payments	\$ 15,742,894,783	\$ 699,100,181



## Experience Gain/(Loss) -- June 30, 2018

	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)%

\* *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;
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, 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.

### **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, 2039.

### **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	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%

# After reflection of changes in assumptions.

\* After reflection of changes in legislation.

\*\*\* Unavailable.

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

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)	(2)	(3)		(1)	(2)	(3)
	Aggregate Member Contributions	Current Retirees & Beneficiaries	Active & Inactive Members (Employer Financed Portion)				
2008	\$2,312,069	\$3,618,118	\$1,891,129	\$5,302,034	100%	83%	0%
2009 *	2,393,635	4,012,274	2,069,143	4,937,320	100%	63%	0%
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%

# After reflection of changes in assumptions.

\* After reflection of changes in legislation.

# Pension Solvency Test -- Comparative Statement

## (\$ in Thousands)

Group	Fiscal Year		Projected Pension Liabilities for				Percentage of Accrued Liabilities Covered by Net Assets Available		
			(1)	(2)	(3)	Net Assets Available for Benefits	(1)	(2)	(3)
			Aggregate Member Contributions	Current Retirees & Beneficiaries	Active & Inactive Members (Employer Financed Portion)				
Employees	2009	*	\$ 899,364	\$ 1,217,430	\$ 666,232	\$ 1,600,150	100%	58%	0%
Teachers	2009	*	926,049	1,608,341	855,367	1,957,103	100%	64%	0%
Police	2009	*	381,273	790,433	378,409	940,825	100%	71%	0%
Fire	2009	*	186,949	396,070	169,135	439,241	100%	64%	0%
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%

# After reflection of changes in assumptions.

\* After reflection of changes in legislation.

# Development of Pension Actuarial Liabilities

## June 30, 2018

### 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	\$ 2,126,337,034	\$ 348,764,264	\$ 1,777,572,770
Disability benefits likely to be paid to present active members	79,474,032	46,940,836	32,533,196
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	37,809,472	16,770,725	21,038,747
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	399,490,223	271,638,430	127,851,793
Benefits likely to be paid to current inactive and vested deferred members	143,313,289	-	143,313,289
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	2,391,404,474	-	2,391,404,474
Total	\$ 5,177,828,524	\$ 684,114,255	\$ 4,493,714,269
Actuarial Value of Assets	\$ 2,922,357,782	-	\$ 2,922,357,782
Liabilities to be Covered by Future Contributions	\$ 2,255,470,742	\$ 684,114,255	\$ 1,571,356,487
Funded Ratio			65.0%



# Development of Pension Actuarial Liabilities

## June 30, 2018

### 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	\$ 2,546,701,044	\$ 461,883,939	\$ 2,084,817,105
Disability benefits likely to be paid to present active members	56,424,343	25,092,296	31,332,047
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	23,222,682	10,135,101	13,087,581
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	437,814,622	278,465,891	159,348,731
Benefits likely to be paid to current inactive and vested deferred members	122,772,823	-	122,772,823
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	2,956,674,867	-	2,956,674,867
<b>Total</b>	<b>\$ 6,143,610,381</b>	<b>\$ 775,577,227</b>	<b>\$ 5,368,033,154</b>
Actuarial Value of Assets	\$ 3,176,932,495	-	\$ 3,176,932,495
Liabilities to be Covered by Future Contributions	\$ 2,966,677,886	\$ 775,577,227	\$ 2,191,100,659
Funded Ratio			59.2%

# Development of Pension Actuarial Liabilities

## June 30, 2018

### 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	\$ 1,060,274,581	\$ 218,926,008	\$ 841,348,573
Disability benefits likely to be paid to present active members	78,865,821	37,985,246	40,880,575
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	10,212,054	5,657,251	4,554,803
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	220,759,855	118,872,765	101,887,090
Benefits likely to be paid to current inactive and vested deferred members	31,469,491	-	31,469,491
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	1,596,511,865	-	1,596,511,865
<b>Total</b>	<b>\$ 2,998,093,667</b>	<b>\$ 381,441,270</b>	<b>\$ 2,616,652,397</b>
Actuarial Value of Assets	\$ 1,758,300,711	-	\$ 1,758,300,711
Liabilities to be Covered by Future Contributions	\$ 1,239,792,956	\$ 381,441,270	\$ 858,351,686
Funded Ratio			67.2%

# Development of Pension Actuarial Liabilities

## June 30, 2018

### 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	\$ 589,695,896	\$ 146,581,538	\$ 443,114,358
Disability benefits likely to be paid to present active members	36,282,336	18,567,224	17,715,112
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	6,276,929	3,283,620	2,993,309
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	63,364,103	30,180,958	33,183,145
Benefits likely to be paid to current inactive and vested deferred members	4,886,070	-	4,886,070
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees	722,856,877	-	722,856,877
<b>Total</b>	<b>\$ 1,423,362,211</b>	<b>\$ 198,613,340</b>	<b>\$ 1,224,748,871</b>
Actuarial Value of Assets	\$ 853,348,344	-	\$ 853,348,344
Liabilities to be Covered by Future Contributions	\$ 570,013,867	\$ 198,613,340	\$ 371,400,527
Funded Ratio			69.7%

## 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%	

*# 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 2017 valuation are for the 2020-2021 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 a 20-year period 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, 2015 valuation effective from July 1, 2017 to June 30, 2019 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.

<b>Salary Increase Assumptions for an Individual Member</b>			
<b>Service Index</b>	<b>Merit &amp; Seniority</b>	<b>Base (Economy)</b>	<b>Increase Next Year</b>
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.

<b>Salary Increase Assumptions for an Individual Member</b>			
<b>Service Index</b>	<b>Merit &amp; Seniority</b>	<b>Base (Economy)</b>	<b>Increase Next Year</b>
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.

<b>Salary Increase Assumptions for an Individual Member</b>			
<b>Service Index</b>	<b>Merit &amp; Seniority</b>	<b>Base (Economy)</b>	<b>Increase Next Year</b>
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	0.127%	0.132%	48.95	50.85		
40	0.187%	0.189%	43.74	45.71		
45	0.276%	0.238%	38.64	40.66		
50	0.422%	0.317%	33.70	35.67		
55	0.629%	0.450%	28.97	30.81		
60	0.877%	0.647%	24.47	26.11		
65	1.233%	0.965%	20.17	21.60		
70	1.878%	1.536%	16.11	17.34		
75	3.053%	2.537%	12.38	13.43		
80	5.151%	4.319%	9.11	9.96		
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	0.110%	0.093%	50.61	54.65		
40	0.161%	0.133%	45.37	49.44		
45	0.238%	0.167%	40.23	44.30		
50	0.364%	0.223%	35.23	39.21		
55	0.542%	0.316%	30.42	34.22		
60	0.756%	0.454%	25.83	29.36		
65	1.063%	0.677%	21.43	24.65		
70	1.619%	1.077%	17.25	20.16		
75	2.632%	1.780%	13.40	15.97		
80	4.441%	3.031%	9.98	12.19		
Ref:	2135	x	1.00	2136	x	0.87

\* Applicable to calendar year 2018. 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 Ages	Probability of Dying Next Year*		Future Life Expectancy (years)*			
	Men	Women	Men	Women		
35	0.108%	0.113%	50.72	52.53		
40	0.160%	0.162%	45.48	47.36		
45	0.236%	0.204%	40.34	42.26		
50	0.361%	0.271%	35.33	37.23		
55	0.537%	0.384%	30.52	32.31		
60	0.748%	0.553%	25.93	27.53		
65	1.052%	0.825%	21.52	22.93		
70	1.603%	1.313%	17.33	18.56		
75	2.606%	2.168%	13.47	14.52		
80	4.396%	3.692%	10.04	10.92		
Ref:	2135	x	0.99	2136	x	1.06

### Fire

Sample Attained Ages	Probability of Dying Next Year*		Future Life Expectancy (years)*			
	Men	Women	Men	Women		
35	0.110%	0.107%	50.61	53.05		
40	0.161%	0.154%	45.37	47.87		
45	0.238%	0.194%	40.23	42.76		
50	0.364%	0.258%	35.23	37.71		
55	0.542%	0.366%	30.42	32.77		
60	0.756%	0.527%	25.83	27.97		
65	1.063%	0.786%	21.43	23.35		
70	1.619%	1.251%	17.25	18.95		
75	2.632%	2.066%	13.40	14.87		
80	4.441%	3.518%	9.98	11.22		
Ref:	2135	x	1.00	2136	x	1.01

\* Applicable to calendar year 2018. 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>		
<b>Sample Ages</b>	<b>Probability of Occurrence Next Year*</b>	
	<b>Disabled Death</b>	
	<b>Men</b>	<b>Women</b>
20	0.044%	0.021%
25	0.192%	0.099%
30	0.492%	0.274%
35	0.899%	0.550%
40	1.307%	0.818%
45	1.692%	1.037%
50	2.120%	1.365%
55	2.562%	1.798%
Ref	2137	2138
	1.16	1.24

<u>Teachers</u>		
<b>Sample Ages</b>	<b>Probability of Occurrence Next Year*</b>	
	<b>Disabled Death</b>	
	<b>Men</b>	<b>Women</b>
20	0.038%	0.014%
25	0.166%	0.069%
30	0.424%	0.192%
35	0.775%	0.386%
40	1.127%	0.574%
45	1.458%	0.727%
50	1.827%	0.958%
55	2.209%	1.261%
Ref	2137	2138
	1.00	0.87

\* Applicable to calendar year 2018. 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	0.037%	0.018%
25	0.164%	0.085%
30	0.420%	0.234%
35	0.767%	0.470%
40	1.115%	0.699%
45	1.444%	0.886%
50	1.809%	1.167%
55	2.187%	1.537%
Ref	2137	2138
	0.99	1.06

### Fire

Sample Ages	<u>Probability of Occurrence Next Year*</u>	
	<u>Disabled Death</u>	
	Men	Women
20	0.038%	0.017%
25	0.166%	0.081%
30	0.424%	0.223%
35	0.775%	0.448%
40	1.127%	0.666%
45	1.458%	0.845%
50	1.827%	1.112%
55	2.209%	1.464%
Ref	2137	2138
	1.00	1.01

\* Applicable to calendar year 2018. 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	0.037%	0.017%				
25	0.046%	0.017%				
30	0.046%	0.026%				
35	0.055%	0.037%				
40	0.065%	0.049%				
45	0.098%	0.074%				
50	0.175%	0.126%				
55	0.306%	0.208%				
Ref	2133	x	1.16	2134	x	1.24

#### Teachers

Sample Ages	Probability of Occurrence Next Year*					
	Death Before Retirement					
	Men			Women		
20	0.032%	0.012%				
25	0.039%	0.012%				
30	0.039%	0.018%				
35	0.047%	0.026%				
40	0.056%	0.035%				
45	0.084%	0.052%				
50	0.151%	0.089%				
55	0.264%	0.146%				
Ref	2133	x	1.00	2134	x	0.87

\* Applicable to calendar year 2018. 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			0.031%			0.014%
25			0.039%			0.014%
30			0.039%			0.022%
35			0.047%			0.032%
40			0.055%			0.042%
45			0.084%			0.063%
50			0.150%			0.108%
55			0.261%			0.178%
Ref	2133	x	0.99	2134	x	1.06

## Fire

Sample Ages	Probability of Occurrence Next Year*					
	Death Before Retirement					
	Men			Women		
20			0.032%			0.013%
25			0.039%			0.013%
30			0.039%			0.021%
35			0.047%			0.030%
40			0.056%			0.040%
45			0.084%			0.060%
50			0.151%			0.103%
55			0.264%			0.169%
Ref	2133	x	1.00	2134	x	1.01

\* Applicable to calendar year 2018. 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

<b><i>Administrative &amp; Investment Expenses</i></b>	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.
<b><i>Benefit Service</i></b>	Exact Fractional service is used to determine the amount of benefit payable.
<b><i>COLA</i></b>	None assumed.
<b><i>Decrement Operation</i></b>	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.
<b><i>Decrement Timing</i></b>	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.
<b><i>Eligibility Testing</i></b>	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.
<b><i>Forfeitures</i></b>	The percent of vested members who quit before retirement who elect to refund and forfeit their pension is assumed to be 25% at first vesting eligibility, grading to 0% at first retirement eligibility.
<b><i>Incidence of Contributions</i></b>	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.
<b><i>Liability Adjustments</i></b>	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.

<b><i>Service Credit Accruals</i></b>	It is assumed that members accrue one year of service credit per year.
<b><i>Service Purchases</i></b>	One month of service was added to the reported service for all active participants in consideration of potential subsidized service purchases in the future.
<b><i>Split Benefits</i></b>	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.
<b><i>Data Adjustments</i></b>	New active member pays were annualized.  The NHRS underwent a thorough review of the medical subsidy data. We used the data as submitted without further audit.
<b><i>Medical Subsidy</i></b>	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.  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.
<b><i>IRC Section 415(b) and 401(a)(17)</i></b>	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

<b>Statute</b>	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.
<b>Effective Date</b>	July 1, 1967
<b>Plan Year</b>	July 1 through June 30
<b>Type of Plan</b>	Qualified, governmental defined benefit retirement plan; it is a single plan for financial reporting purposes.
<b>Eligibility Requirements</b>	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.
<b>Creditable Service</b>	Service measured from date of employment to date of retirement or prior termination plus service credited under one or more of the predecessor systems.
<b>Earnable Compensation</b>	<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.</p> <p>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 – Full base rate of compensation paid plus any overtime pay, holiday and vacation pay, sick 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. Compensation for extra and special duty, as determined by the employer, shall be eliminated for those hired after July 1, 2011 and shall be included but limited during the highest 5 years of creditable service as provided in paragraph RSA 100-A:1 XVIII as amended.</p>



## Plan Provisions – Group I

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 those hired before July 1, 2011 and immediately for those hired on or after July 1, 2011.

### Average Final Compensation

Average annual earnable compensation during the highest 3 years of creditable service.

For active members who commenced service on or after July 1, 2011 or who have non-vested status on or after 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 commencing 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 1/60<sup>th</sup> of AFC times creditable service (1/66<sup>th</sup> of AFC times creditable service for members commencing service on or after July 1, 2011).

After age 65, the state annuity, together with the member annuity, shall be equal to 1/66<sup>th</sup> 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 commencing 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 commencing 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**

Eligibility: 10 or more years of creditable service.

Benefit: Service Retirement Benefit at attained normal retirement eligibility age. 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.

### **Accidental Disability**

Eligibility: Permanently disabled in the performance of duty.

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.

### **Accidental Death Benefits**

Eligibility: Accidental death in the performance of duty.

Benefit: 50% times AFC.

### **Ordinary Death Benefits**

Eligibility: Death other than accidental death.

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.

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.

### **Post Retirement Death**

Not applicable.

### **Optional Forms**

Each of the following options shall be of equivalent actuarial value to the 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 own contributions are refunded. If a Member terminates with 10 or more years of service, the Member either receives his service retirement or reduced early service retirement benefit beginning at any age after age 50 (age 60 for members hired after July 1, 2011) or the member may apply for a refund of accumulated contributions.

## Plan Provisions – Group I

### ***Maximum Benefit***

For members who hired prior to July 1, 2009, 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 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.

### ***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.
3. Upon death prior to age 60 of a member electing vested deferred retirement, the member's accumulated contributions 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(h) or the actual rate of return, whichever is lower.

### ***Employer Contributions***

As prescribed in RSA 100-A:16.

### ***Temporary Supplemental Allowances***

None.

### ***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

<b>Statute</b>	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.
<b>Effective Date</b>	July 1, 1967
<b>Plan Year</b>	July 1 through June 30
<b>Type of Plan</b>	Qualified, governmental defined benefit retirement plan; it is a single plan for financial reporting purposes.
<b>Eligibility Requirements</b>	Any permanent policeman or permanent fireman becomes a Group II member as a condition of employment.
<b>Creditable Service</b>	Service measured from date of employment to date of retirement or prior termination plus service credited under one or more of the predecessor systems.
<b>Earnable Compensation</b>	<p>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.</p> <p>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. Full base rate of compensation paid plus any overtime pay, holiday and vacation pay, sick 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. Compensation for extra and special duty, as determined by the employer, shall be eliminated for those hired after July 1, 2011 and shall be included but limited during the highest 5 years of creditable service as provided in paragraph RSA 100-A:1 XVIII as amended.</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 those hired before July 1, 2011 and immediately for those hired on or after July 1, 2011.

### Average Final Compensation

Average annual earnable compensation during the highest 3 years of creditable service.

For active members who commenced service on or after July 1, 2011 or who have non-vested status on or after 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 commencing 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 commencing 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 non-vested status as of January 1, 2012 shall be subject to the following 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 according to 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%

A member retiring at age 45 with 20 years of service 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 hired prior to July 1, 2011 who have vested status as of 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 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.

Members hired prior to July 1, 2011 who have non-vested status as of 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.

### **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.

## Plan Provisions – Group II

### **Ordinary Death Benefits**

Eligibility: Death other than accidental death.

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.

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.

### **Post Retirement Death**

Retired prior to April 1, 1987, lump sum of \$3,600 or in the case of accidental disability, 50% of the accidental disability benefit payable to surviving spouse.

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. Not applicable.

Option 3. 50% Joint and Survivor.

Option 4. Other Joint and Survivor, not to exceed 50%.

### **Vested Termination**

If a member terminates with less than 10 years of service, the Member's own 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 hired prior to July 1, 2009, 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 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.

### **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.
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.
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 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.

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(h) or the actual rate of return, whichever is lower.

### **Employer Contributions**

As prescribed in RSA 100-A:16.

### **Temporary Supplemental Allowances**

None.

### **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

## 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

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### STATISTICAL SECTION

## Historical Membership Data - Retired (Dollars in Thousands)

Fiscal Year	Added to Rolls		Removed from Rolls		Rolls End of Year		Average Annual	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 %

\* 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
40 - 44						
45 - 49	20	\$ 121,499	\$ 6,075	6	\$ 41,705	\$ 6,951
50 - 54	80	901,429	11,268	56	717,663	12,815
55 - 59	239	3,886,605	16,262	282	4,950,825	17,556
60 - 64	932	20,058,606	21,522	1,309	21,577,137	16,484
65 - 69	1,657	29,769,233	17,966	2,466	32,593,032	13,217
70 - 74	1,624	25,810,256	15,893	2,189	25,202,700	11,513
75 - 79	971	13,782,961	14,195	1,370	13,689,441	9,992
80 - 84	615	8,037,290	13,069	774	6,826,489	8,820
85 - 89	306	4,246,525	13,878	420	3,614,400	8,606
90 - 94	124	1,433,978	11,564	202	1,641,157	8,125
95 - 99	24	295,233	12,301	50	334,903	6,698
100 & Over	4	10,375	2,594	5	25,965	5,193
<b>TOTAL</b>	<b>6,596</b>	<b>\$ 108,353,990</b>	<b>\$ 16,427</b>	<b>9,129</b>	<b>\$ 111,215,417</b>	<b>\$ 12,183</b>

## DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
30 - 34						
35 - 39	2	\$ 31,292	\$ 15,646	3	\$ 49,011	\$ 16,337
40 - 44	2	25,087	12,544	7	88,295	12,614
45 - 49	14	219,999	15,714	10	139,596	13,960
50 - 54	37	559,087	15,110	34	439,017	12,912
55 - 59	70	1,060,456	15,149	80	1,059,391	13,242
60 - 64	85	1,186,639	13,960	113	1,485,332	13,145
65 - 69	95	1,362,140	14,338	105	1,255,970	11,962
70 - 74	63	867,505	13,770	87	1,052,059	12,093
75 - 79	36	513,002	14,250	42	555,943	13,237
80 - 84	14	149,363	10,669	8	101,438	12,680
85 - 89	5	73,353	14,671	5	59,356	11,871
90 - 94	1	9,977	9,977	3	37,600	12,533
95 - 99						
100 & Over						
<b>TOTAL</b>	<b>424</b>	<b>\$ 6,057,900</b>	<b>\$ 14,288</b>	<b>497</b>	<b>\$ 6,323,008</b>	<b>\$ 12,722</b>

## Retirees and Beneficiaries Age Distribution Employees

### BENEFICIARIES OF DECEASED MEMBERS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
Under 20	1	\$ 1,921	\$ 1,921			
20 - 24	1	1,774	1,774	4	\$ 13,196	\$ 3,299
25 - 29	3	32,175	10,725	2	6,357	3,179
30 - 34	2	7,136	3,568			
35 - 39	4	12,078	3,020	4	16,290	4,073
40 - 44	4	29,049	7,262	8	44,062	5,508
45 - 49	6	31,869	5,312	12	59,098	4,925
50 - 54	8	26,656	3,332	18	142,261	7,903
55 - 59	18	159,155	8,842	58	672,996	11,603
60 - 64	32	233,768	7,305	91	1,108,429	12,181
65 - 69	41	381,253	9,299	156	1,970,761	12,633
70 - 74	47	424,852	9,039	187	2,324,373	12,430
75 - 79	43	356,748	8,296	208	2,511,274	12,073
80 - 84	31	186,480	6,015	231	2,875,305	12,447
85 - 89	22	178,424	8,110	176	2,224,427	12,639
90 - 94	14	110,825	7,916	90	864,110	9,601
95 - 99	1	10,627	10,627	23	139,890	6,082
100 & Over				1	756	756
<b>TOTAL</b>	<b>278</b>	<b>\$ 2,184,790</b>	<b>\$ 7,859</b>	<b>1,269</b>	<b>\$ 14,973,585</b>	<b>\$ 11,800</b>

# Retirees and Beneficiaries Age Distribution Teachers

## SERVICE RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
50 - 54	8	\$ 153,230	\$ 19,154	23	\$ 329,504	\$ 14,326
55 - 59	67	1,505,721	22,473	200	4,140,119	20,701
60 - 64	327	9,331,712	28,537	1,348	32,516,449	24,122
65 - 69	923	22,804,983	24,707	3,023	67,581,188	22,356
70 - 74	1,039	25,122,094	24,179	2,461	50,978,131	20,714
75 - 79	483	11,215,496	23,220	1,028	19,856,161	19,315
80 - 84	260	6,585,234	25,328	573	11,113,166	19,395
85 - 89	142	3,432,899	24,175	251	4,776,703	19,031
90 - 94	30	623,920	20,797	118	2,083,796	17,659
95 - 99	4	45,833	11,458	45	634,672	14,104
100 & Over	1	16,715	16,715	6	81,373	13,562
<b>TOTAL</b>	<b>3,284</b>	<b>\$ 80,837,837</b>	<b>\$ 24,616</b>	<b>9,076</b>	<b>\$ 194,091,262</b>	<b>\$ 21,385</b>

## DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
40 - 44				2	\$ 22,485	\$ 11,243
45 - 49	2	\$ 33,375	\$ 16,688	2	36,867	18,434
50 - 54	2	31,354	15,677	12	197,393	16,449
55 - 59	4	75,336	18,834	20	356,424	17,821
60 - 64	4	59,121	14,780	30	579,910	19,330
65 - 69	8	113,055	14,132	34	602,046	17,707
70 - 74	6	139,367	23,228	25	410,203	16,408
75 - 79	4	77,828	19,457	15	259,636	17,309
80 - 84	4	80,584	20,146	9	175,829	19,537
85 - 89	5	75,243	15,049	4	64,582	16,146
90 - 94				1	12,009	12,009
95 - 99						
100 & Over						
<b>TOTAL</b>	<b>39</b>	<b>\$ 685,263</b>	<b>\$ 17,571</b>	<b>154</b>	<b>\$ 2,717,384</b>	<b>\$ 17,645</b>

## 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	\$ 8,961	\$ 8,961
25 - 29	1	\$ 8,961	\$ 8,961	1	9,572	9,572
30 - 34	1	4,741	4,741	3	30,789	10,263
35 - 39	2	24,285	12,143	2	30,276	15,138
40 - 44	3	43,903	14,634	3	9,587	3,196
45 - 49	6	44,532	7,422	2	22,002	11,001
50 - 54	9	86,891	9,655	5	41,824	8,365
55 - 59	12	104,136	8,678	12	221,869	18,489
60 - 64	20	331,378	16,569	31	476,632	15,375
65 - 69	36	704,429	19,567	62	1,255,223	20,246
70 - 74	52	882,753	16,976	85	2,076,251	24,426
75 - 79	48	790,115	16,461	95	2,255,288	23,740
80 - 84	28	468,778	16,742	60	1,439,803	23,997
85 - 89	22	377,170	17,144	39	774,938	19,870
90 - 94	8	166,601	20,825	12	162,095	13,508
95 - 99	2	31,170	15,585	6	61,458	10,243
100 & Over				1	2,808	2,808
<b>TOTAL</b>	<b>250</b>	<b>\$4,069,843</b>	<b>\$16,279</b>	<b>420</b>	<b>\$8,879,376</b>	<b>\$21,141</b>

# 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	38,396	9,599
45 - 49	191	\$ 9,642,617	\$ 50,485	47	1,352,757	28,782
50 - 54	370	19,831,014	53,597	73	1,753,498	24,021
55 - 59	481	24,850,707	51,665	96	2,504,964	26,093
60 - 64	457	20,889,042	45,709	108	2,240,649	20,747
65 - 69	394	15,257,319	38,724	75	1,450,288	19,337
70 - 74	305	10,617,927	34,813	63	821,281	13,036
75 - 79	187	5,774,383	30,879	31	445,519	14,372
80 - 84	93	2,367,804	25,460	13	194,228	14,941
85 - 89	39	1,020,711	26,172	7	111,014	15,859
90 - 94	12	443,707	36,976	2	31,834	15,917
95 - 99	2	35,448	17,724			
100 & Over	1	47,166	47,166			
<b>TOTAL</b>	<b>2,532</b>	<b>\$ 110,777,845</b>	<b>\$ 43,751</b>	<b>520</b>	<b>\$ 10,947,818</b>	<b>\$ 21,053</b>

## DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
25 - 29	2	\$ 54,992	\$ 27,496			
30 - 34				2	\$ 49,584	\$ 24,792
35 - 39	8	293,215	36,652	1	23,123	23,123
40 - 44	23	957,995	41,652	6	217,308	36,218
45 - 49	21	810,720	38,606	3	143,038	47,679
50 - 54	55	2,080,638	37,830	10	344,329	34,433
55 - 59	44	1,428,054	32,456	7	214,524	30,646
60 - 64	48	1,522,172	31,712	8	238,035	29,754
65 - 69	40	1,337,749	33,444	9	244,399	27,155
70 - 74	46	1,323,364	28,769	9	188,622	20,958
75 - 79	23	720,379	31,321	1	22,800	22,800
80 - 84	8	243,795	30,474	1	12,357	12,357
85 - 89	4	80,563	20,141			
95 - 99	1	12,126	12,126			
100 & Over						
<b>TOTAL</b>	<b>323</b>	<b>\$ 10,865,762</b>	<b>\$ 33,640</b>	<b>57</b>	<b>\$ 1,698,119</b>	<b>\$ 29,792</b>

# Retirees and Beneficiaries Age Distribution Police

## BENEFICIARIES OF DECEASED MEMBERS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
Under 20						
20 - 24	2	\$ 25,681	\$ 12,841			
25 - 29	1	10,821	10,821			
30 - 34	1	11,314	11,314			
35 - 39				3	\$ 31,989	\$ 10,663
40 - 44	1	3,427	3,427	4	54,335	13,584
45 - 49	1	3,991	3,991	9	160,873	17,875
50 - 54	3	49,397	16,466	10	270,349	27,035
55 - 59	4	42,656	10,664	29	658,613	22,711
60 - 64	7	121,803	17,400	50	1,060,220	21,204
65 - 69	3	38,128	12,709	60	984,947	16,416
70 - 74	3	37,468	12,489	76	1,609,489	21,177
75 - 79	2	34,094	17,047	78	1,120,121	14,361
80 - 84	6	37,633	6,272	62	834,110	13,453
85 - 89				42	592,782	14,114
90 - 94	2	20,243	10,122	23	316,705	13,770
95 - 99				6	60,031	10,005
100 & Over	1	12,498	12,498	2	22,988	11,494
<b>TOTAL</b>	<b>37</b>	<b>\$ 449,154</b>	<b>\$ 12,139</b>	<b>454</b>	<b>\$ 7,777,552</b>	<b>\$ 17,131</b>

## Retirees and Beneficiaries Age Distribution Fire

### SERVICE RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
45 - 49	29	\$ 1,453,960	\$50,137	12	\$ 239,789	\$ 19,982
50 - 54	140	7,686,148	54,901	23	498,844	21,689
55 - 59	183	11,007,848	60,152	27	452,065	16,743
60 - 64	246	13,165,026	53,516	27	356,236	13,194
65 - 69	221	10,598,317	47,956	24	406,275	16,928
70 - 74	130	5,102,027	39,246	9	156,007	17,334
75 - 79	85	3,325,560	39,124	2	30,433	15,217
80 - 84	56	1,743,400	31,132	2	35,950	17,975
85 - 89	18	494,841	27,491			
90 - 94	14	382,661	27,333			
95 - 99						
100 & Over						
<b>TOTAL</b>	<b>1,122</b>	<b>\$54,959,788</b>	<b>\$48,984</b>	<b>126</b>	<b>\$2,175,599</b>	<b>\$17,267</b>

### DISABILITY RETIREMENTS

Age Group	Males			Females		
	Number	Amount	Average	Number	Amount	Average
30 - 34	1	\$ 19,303	\$ 19,303			
35 - 39	2	71,400	35,700			
40 - 44	4	96,388	24,097			
45 - 49	6	241,668	40,278			
50 - 54	13	542,849	41,758	3	\$ 92,917	\$ 30,972
55 - 59	14	430,665	30,762	2	76,735	38,368
60 - 64	18	664,372	36,910	1	26,454	26,454
65 - 69	19	584,393	30,758			
70 - 74	10	259,225	25,923			
75 - 79	14	391,966	27,998			
80 - 84	10	269,297	26,930			
85 - 89	3	95,697	31,899			
90 - 94	2	62,928	31,464			
95 - 99						
100 & Over						
<b>TOTAL</b>	<b>116</b>	<b>\$3,730,151</b>	<b>\$32,156</b>	<b>6</b>	<b>\$196,106</b>	<b>\$32,684</b>

## 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				1	19,594	19,594
45 - 49	3	35,211	11,737	1	44,756	44,756
50 - 54	1	3,970	3,970	4	85,262	21,316
55 - 59	1	3,970	3,970	18	336,964	18,720
60 - 64	2	5,593	2,797	36	684,643	19,018
65 - 69				41	784,907	19,144
70 - 74				46	1,046,739	22,755
75 - 79				44	628,100	14,275
80 - 84	1	15,853	15,853	32	657,415	20,544
85 - 89				39	656,949	16,845
90 - 94	2	38,479	19,240	22	319,527	14,524
95 - 99				6	77,893	12,982
100 & Over						
<b>TOTAL</b>	<b>12</b>	<b>\$114,902</b>	<b>\$9,575</b>	<b>291</b>	<b>\$5,348,662</b>	<b>\$18,380</b>



## Active Members by Valuation Division

Valuation Group	Active Members	Valuation Payroll	Average		
			Age	Service*	Pay
Employees:					
Male	9,585	\$ 527,269,679	48.6	11.3	\$55,010
Female	14,926	677,850,949	49.4	10.8	45,414
Total	24,511	1,205,120,628	49.1	11.0	49,167
Teachers:					
Male	3,832	256,630,303	46.1	14.2	66,970
Female	13,920	859,588,137	46.0	13.2	61,752
Total	17,752	1,116,218,440	46.0	13.4	62,878
Police:					
Male	3,633	266,830,896	38.9	11.1	73,446
Female	564	35,368,546	38.5	8.8	62,710
Total	4,197	302,199,442	38.9	10.8	72,004
Fire:					
Male	1,624	126,171,652	41.5	13.3	77,692
Female	37	2,524,907	40.2	11.1	68,241
Total	1,661	128,696,559	41.4	13.2	77,481
Total:					
Male	18,674	1,176,902,530	45.6	12.0	63,024
Female	29,447	1,575,332,539	47.5	11.9	53,497
Grand Total	48,121	\$2,752,235,069	46.8	12.0	\$57,194

\* 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	9,901	\$ 547,551,420
Political Subdivisions	14,610	657,569,208
Subtotal	24,511	1,205,120,628
Teachers:	17,752	1,116,218,440
Police:		
State	1,047	77,616,665
Political Subdivisions	3,150	224,582,777
Subtotal	4,197	302,199,442
Fire:		
State	67	4,237,855
Political Subdivisions	1,594	\$124,458,704
Subtotal	1,661	128,696,559
Total	48,121	\$ 2,752,235,069

# Active Members Age and Service Distribution

## Employees June 30, 2018

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	25							25	\$ 553,757
20-24	648	2						650	19,021,708
25-29	1,239	142	5					1,386	49,874,793
30-34	1,144	416	211	5				1,776	77,533,793
35-39	993	396	467	149	1			2,006	94,845,349
40-44	899	378	426	325	86	1		2,115	105,739,380
45-49	1,067	514	587	481	274	121	11	3,055	156,937,805
50-54	1,049	630	722	559	327	302	205	3,794	196,607,031
55-59	974	680	926	745	436	325	388	4,474	232,886,380
60-64	619	510	742	674	413	291	335	3,584	184,731,717
65-69	171	193	316	282	139	111	121	1,333	71,064,750
70+	47	34	64	62	40	27	39	313	15,324,165
<b>TOTAL</b>	<b>8,875</b>	<b>3,895</b>	<b>4,466</b>	<b>3,282</b>	<b>1,716</b>	<b>1,178</b>	<b>1,099</b>	<b>24,511</b>	<b>\$ 1,205,120,628</b>

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

Age: 49.1 years  
 Service: 11.0 years  
 Annual Pay: \$49,167

# Active Members Age and Service Distribution

## Teachers June 30, 2018

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	177							177	6,617,388
25-29	1,148	185						1,333	57,505,792
30-34	731	922	226					1,879	93,554,683
35-39	496	620	1,082	168	1			2,367	138,039,504
40-44	377	389	658	853	110	1		2,388	154,620,222
45-49	373	397	531	583	521	67	1	2,473	164,376,128
50-54	301	295	476	422	383	302	83	2,262	152,430,063
55-59	174	207	433	485	321	238	462	2,320	161,919,777
60-64	83	102	265	371	310	190	475	1,796	130,826,744
65-69	19	36	86	140	139	69	181	670	50,041,050
70+	3	8	19	17	11	8	21	87	6,287,089
<b>TOTAL</b>	<b>3,882</b>	<b>3,161</b>	<b>3,776</b>	<b>3,039</b>	<b>1,796</b>	<b>875</b>	<b>1,223</b>	<b>17,752</b>	<b>\$ 1,116,218,440</b>

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: \$62,878

# Active Members Age and Service Distribution

## Police June 30, 2018

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	\$ 101,974
20-24	255							255	10,732,385
25-29	574	111						685	37,612,124
30-34	265	315	117					697	46,657,764
35-39	106	130	323	82	3			644	48,648,062
40-44	53	59	136	300	66	2		616	51,595,362
45-49	43	42	106	185	195	33	2	606	51,805,039
50-54	46	30	47	108	62	55	24	372	30,118,174
55-59	19	22	33	46	24	27	23	194	15,777,403
60-64	5	9	25	21	9	7	14	90	6,800,611
65-69	3	5	5	8	5	1	2	29	1,922,993
70+					2	2	2	6	427,551
<b>TOTAL</b>	<b>1,372</b>	<b>723</b>	<b>792</b>	<b>750</b>	<b>366</b>	<b>127</b>	<b>67</b>	<b>4,197</b>	<b>\$ 302,199,442</b>

*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: \$72,004

# Active Members Age and Service Distribution

## Fire June 30, 2018

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	69							69	3,558,691
25-29	127	44						171	10,141,002
30-34	82	94	64					240	15,522,654
35-39	45	45	117	40	1			248	18,423,521
40-44	13	23	71	103	26			236	19,165,568
45-49	12	18	58	113	64	28		293	25,094,079
50-54	5	9	34	74	43	49	24	238	21,596,702
55-59	7	4	16	25	18	17	33	120	10,906,555
60-64	2	1	4	16	1	7	8	39	3,624,052
65-69		2		1		1	1	5	521,075
70+		2						2	142,660
<b>TOTAL</b>	<b>362</b>	<b>242</b>	<b>364</b>	<b>372</b>	<b>153</b>	<b>102</b>	<b>66</b>	<b>1,661</b>	<b>\$ 128,696,559</b>

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

Age: 41.4 years  
 Service: 13.2 years  
 Annual Pay: \$77,481

## Active Members Age and Service Distribution

**Total  
June 30, 2018**

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	28							28	\$ 655,731
20-24	1,149	2						1,151	39,930,172
25-29	3,088	482	5					3,575	155,133,711
30-34	2,222	1,747	618	5				4,592	233,268,894
35-39	1,640	1,191	1,989	439	6			5,265	299,956,436
40-44	1,342	849	1,291	1,581	288	4		5,355	331,120,532
45-49	1,495	971	1,282	1,362	1,054	249	14	6,427	398,213,051
50-54	1,401	964	1,279	1,163	815	708	336	6,666	400,751,970
55-59	1,174	913	1,408	1,301	799	607	906	7,108	421,490,115
60-64	709	622	1,036	1,082	733	495	832	5,509	325,983,124
65-69	193	236	407	431	283	182	305	2,037	123,549,868
70+	50	44	83	79	53	37	62	408	22,181,465
<b>TOTAL</b>	<b>14,491</b>	<b>8,021</b>	<b>9,398</b>	<b>7,443</b>	<b>4,031</b>	<b>2,282</b>	<b>2,455</b>	<b>48,121</b>	<b>\$ 2,752,235,069</b>

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

Age: 46.8 years  
Service: 12.0 years  
Annual Pay: \$57,194

## 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

\* Average annual increase.

### By Valuation Group (Valuation Payroll in Thousands)

	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 %

	Fiscal Year	Active Members#	Valuation Payroll	Average Compensation	% Inc.*
Employees	2017	24,478	\$1,179,518	\$48,187	3.97 %
Teachers		17,617	1,073,447	60,932	1.69 %
Police		4,151	291,004	70,104	3.41 %
Fire		1,640	123,643	75,392	3.23 %
Total		47,886	\$2,667,612	\$55,708	2.94 %

# Excludes temporary inactive members.

\* Average annual increase.

## Summary of Membership Data by Category

	June 30	
	2018	2017
<b>Active Members</b>		
Number	48,121	47,886
Average age (years)	46.8	46.9
Average service* (years)	12.0	12.1
Average salary	\$57,194	\$55,708
Total payroll supplied, annualized	\$ 2,752,235,069	\$ 2,667,611,532
<b>Vested Inactive Members</b>		
Number	2,420	2,281
Average age (years)	52.2	51.8
<b>Non-Vested Inactive Members</b>		
Number	11,454	10,477
<b>Service Retirees</b>		
Number	32,385	31,186
Average age (years)	70.0	70.0
Total annual benefits	\$ 673,359,556	\$ 639,679,378
Average annual benefit	\$ 20,792	\$ 20,512
<b>Disability Retirees</b>		
Number	1,616	1,600
Average age (years)	64.2	64.0
Total annual benefits	\$ 32,273,693	\$ 31,739,977
Average annual benefit	\$ 19,971	\$ 19,837
<b>Beneficiaries</b>		
Number	3,011	2,908
Average age (years)	74.2	73.9
Total annual benefits	\$ 43,797,864	\$ 41,692,950
Average annual benefit	\$ 14,546	\$ 14,337
<b>Total Covered Lives</b>	<b>99,007</b>	<b>96,338</b>

\* 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, 2018

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	\$ 4,947,752	\$ 9,991,755	\$ 32,930,151	\$ 33,118,263	\$ 42,305,871	\$ 36,700,590	\$ 89,114,308	\$ 249,108,690
Average annual benefit	\$ 3,818	\$ 5,520	\$ 7,496	\$ 11,200	\$ 14,588	\$ 20,000	\$ 29,685	\$ 13,693
Average monthly benefit	\$ 318	\$ 460	\$ 625	\$ 933	\$ 1,216	\$ 1,667	\$ 2,474	\$ 1,141
Average final compensation	\$ 44,843	\$ 43,280	\$ 42,387	\$ 48,307	\$ 51,342	\$ 58,159	\$ 67,251	\$ 50,863
Number of retired members	1,296 *	1,810	4,393	2,957	2,900	1,835	3,002	18,193 **

\* Includes 332 members who did not have service reported.

\*\* Includes 6,341 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	\$ 1,803,027	\$ 2,518,812	\$ 14,348,076	\$ 22,991,467	\$ 46,163,894	\$ 51,840,287	\$ 151,615,402	\$ 291,280,965
Average annual benefit	\$ 6,050	\$ 6,882	\$ 8,906	\$ 13,850	\$ 18,160	\$ 23,278	\$ 33,551	\$ 22,028
Average monthly benefit	\$ 504	\$ 574	\$ 742	\$ 1,154	\$ 1,513	\$ 1,940	\$ 2,796	\$ 1,836
Average final compensation	\$ 51,800	\$ 57,933	\$ 51,273	\$ 60,591	\$ 64,454	\$ 69,267	\$ 73,802	\$ 65,890
Number of retired members	298 *	366	1,611	1,660	2,542	2,227	4,519	13,223 **

\* Includes 139 members who did not have service reported.

\*\* Includes 4,747 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	\$ 4,947,648	\$ 3,429,149	\$ 8,659,294	\$ 10,079,926	\$ 59,580,384	\$ 37,781,618	\$ 18,038,231	\$ 142,516,250
Average annual benefit	\$ 11,697	\$ 16,728	\$ 19,503	\$ 27,317	\$ 38,095	\$ 55,973	\$ 74,231	\$ 36,328
Average monthly benefit	\$ 975	\$ 1,394	\$ 1,625	\$ 2,276	\$ 3,175	\$ 4,664	\$ 6,186	\$ 3,027
Average final compensation	\$ 53,160	\$ 57,073	\$ 55,252	\$ 67,465	\$ 81,875	\$ 96,419	\$ 108,214	\$ 79,703
Number of retired members	423 *	205	444	369	1,564	675	243	3,923 **

\* Includes 279 members who did not have service reported.

\*\* Includes 1,791 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	\$ 2,193,657	\$ 507,249	\$ 2,186,831	\$ 3,526,055	\$ 21,232,710	\$ 21,172,375	\$ 15,706,331	\$ 66,525,208
Average annual benefit	\$ 13,884	\$ 16,363	\$ 22,089	\$ 26,713	\$ 34,027	\$ 50,652	\$ 74,438	\$ 39,764
Average monthly benefit	\$ 1,157	\$ 1,364	\$ 1,841	\$ 2,226	\$ 2,836	\$ 4,221	\$ 6,203	\$ 3,314
Average final compensation	\$ 56,847	\$ 57,722	\$ 62,629	\$ 71,690	\$ 79,817	\$ 92,171	\$ 102,765	\$ 86,094
Number of retired members	158 *	31	99	132	624	418	211	1,673 **

\* Includes 139 members who did not have service reported.

\*\* Includes 920 members who did not have AFC reported.

## Other Schedules of Interest

### Schedule of Retired and Vested Members by Type of Benefit

#### Employees

June 30, 2018																			
		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	5,397	4,245	48	2	13	-	579	510	3,087	126	350	125	863	311	13	12	-	-	510
501 - 1,000	5,530	4,212	265	111	11	2	445	484	3,059	98	401	123	978	365	15	7	-	-	484
1,001 - 1,500	3,345	2,624	88	235	12	4	184	198	1,724	70	293	101	672	278	6	3	-	-	198
1,501 - 2,000	1,949	1,632	24	92	6	3	112	80	964	32	192	81	433	158	6	3	-	-	80
2,001 - 2,500	1,203	1,066	9	25	-	2	71	30	514	12	146	55	322	118	2	4	-	-	30
2,501 - 3,000	767	698	6	6	1	1	44	11	313	15	102	39	194	91	1	1	-	-	11
3,001 - 3,500	489	458	-	4	1	-	22	4	185	5	87	26	133	48	1	-	-	-	4
3,501 - 4,000	357	334	2	1	-	-	17	3	129	6	59	23	96	40	1	-	-	-	3
Over 4,000	480	456	1	2	3	-	14	4	160	4	81	40	121	67	2	1	-	-	4
Totals	19,517	15,725	443	478	47	12	1,488	1,324	10,135	368	1,711	613	3,812	1,476	47	31	-	-	1,324

#### Teachers

June 30, 2018																			
		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	1,574	1,232	1	-	-	-	80	261	674	29	110	42	350	98	5	5	-	-	261
501 - 1,000	2,209	1,659	36	-	5	-	142	367	1,158	45	123	35	384	89	6	2	-	-	367
1,001 - 1,500	2,021	1,651	79	3	6	-	107	175	982	45	168	58	453	132	4	4	-	-	175
1,501 - 2,000	2,026	1,807	27	5	7	-	105	75	940	50	170	50	528	202	2	9	-	-	75
2,001 - 2,500	2,033	1,891	18	8	-	1	77	38	886	35	179	74	576	233	4	8	-	-	38
2,501 - 3,000	1,583	1,497	7	4	-	-	56	19	662	37	140	54	461	205	1	4	-	-	19
3,001 - 3,500	1,303	1,245	3	2	-	-	46	7	551	23	123	51	407	133	2	6	-	-	7
3,501 - 4,000	744	720	-	-	2	-	19	3	317	17	83	24	197	102	-	1	-	-	3
Over 4,000	677	658	-	-	-	-	17	2	312	7	78	28	163	87	-	-	-	-	2
Totals	14,170	12,360	171	22	20	1	649	947	6,482	288	1,174	416	3,519	1,281	24	39	-	-	947

See Page 114 for footnotes.

## Other Schedules of Interest

### Schedule of Retired and Vested Members by Type of Benefit

#### Police

		June 30, 2018																		
		Type of Retirement**							Option Selected #											
Amount of Monthly Benefit	Number of Retirants*								No. Option										Other	
		1	2	3	4	5	6	7		1	2	3	4	5	6	7	8	9		
\$1 - \$500	223	182	-	-	-	2	38	1	150	1		9	14	23	25	-	-	-	-	1
501 - 1,000	371	198	12	1	-	-	145	15	271	5		15	10	21	31	1	2	-	-	15
1,001 - 1,500	408	188	24	5	2	1	142	46	268	9		14	15	18	38	-	-	-	-	46
1,501 - 2,000	351	212	18	31	2	1	64	23	204	11		8	26	17	62	-	-	-	-	23
2,001 - 2,500	406	293	9	57	1	1	24	21	190	18		12	54	14	95	-	2	-	-	21
2,501 - 3,000	440	302	2	91	-	-	33	12	189	22		11	70	15	121	-	-	-	-	12
3,001 - 3,500	398	337	-	45	2	3	9	2	138	15		8	97	9	128	-	1	-	-	2
3,501 - 4,000	328	290	1	26	1	-	8	2	108	8		2	72	8	128	-	-	-	-	2
Over 4,000	1,125	1,050	2	56	1	1	10	5	285	17		12	320	17	467	2	-	-	-	5
<b>Totals</b>	<b>4,050</b>	<b>3,052</b>	<b>68</b>	<b>312</b>	<b>9</b>	<b>9</b>	<b>473</b>	<b>127</b>	<b>1,803</b>	<b>106</b>		<b>91</b>	<b>678</b>	<b>142</b>	<b>1,095</b>	<b>3</b>	<b>5</b>	<b>-</b>	<b>-</b>	<b>127</b>

#### Fire

		June 30, 2018																		
		Type of Retirement**							Option Selected #											
Amount of Monthly Benefit	Number of Retirants*								No. Option										Other	
		1	2	3	4	5	6	7		1	2	3	4	5	6	7	8	9		
\$1 - \$500	48	27	-	-	-	2	19	-	40	-		3	-	1	4	-	-	-	-	-
501 - 1,000	111	43	1	-	-	-	65	2	105	-		1	-	1	2	-	-	-	-	2
1,001 - 1,500	166	66	7	3	1	4	75	10	124	5		7	7	8	5	-	-	-	-	10
1,501 - 2,000	164	72	8	10	-	1	69	4	120	8		5	7	8	12	-	-	-	-	4
2,001 - 2,500	169	104	7	19	1	3	33	2	92	10		8	20	7	30	-	-	-	-	2
2,501 - 3,000	163	128	1	23	-	-	10	1	60	8		4	29	9	52	-	-	-	-	1
3,001 - 3,500	162	137	1	17	-	2	4	1	46	7		3	41	3	61	-	-	-	-	1
3,501 - 4,000	148	133	-	10	-	1	2	2	48	5		2	29	1	61	-	-	-	-	2
Over 4,000	564	538	-	15	1	-	10	-	153	11		2	144	5	247	1	1	-	-	-
<b>Totals</b>	<b>1,695</b>	<b>1,248</b>	<b>25</b>	<b>97</b>	<b>3</b>	<b>13</b>	<b>287</b>	<b>22</b>	<b>788</b>	<b>54</b>		<b>35</b>	<b>277</b>	<b>43</b>	<b>474</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>22</b>

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, 2018

### 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	\$ 4,244	\$ 4,868	\$ 4,286	\$ 4,358	\$ 3,968	\$ 4,340	\$ 4,316	\$ 4,244
Average monthly benefit	\$ 354	\$ 406	\$ 357	\$ 363	\$ 331	\$ 362	\$ 360	\$ 354
Annual Benefits	\$326,798	\$292,061	\$291,435	\$165,612	\$1,733,949	\$1,284,545	\$2,865,540	\$6,959,940
Number of retired members	77	60	68	38	437	296	664	1,640

\* Includes 7 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	\$ 3,189	\$ 3,029	\$ 3,344	\$ 4,344	\$ 4,168	\$ 4,134	\$ 4,789	\$ 4,297
Average monthly benefit	\$ 266	\$ 252	\$ 279	\$ 362	\$ 347	\$ 345	\$ 399	\$ 358
Annual Benefits	\$41,454	\$27,258	\$33,438	\$13,033	\$2,317,620	\$1,128,679	\$1,465,556	\$5,027,038
Number of retired members	13	9	10	3	556	273	306	1,170

\* Includes 6 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	\$ 3,253	\$2,842	\$ 3,969	\$0	\$ 4,369	\$ 4,499	\$ 4,997	\$ 4,738
Average monthly benefit	\$ 271	\$ 237	\$ 331	\$ 0	\$ 364	\$ 375	\$ 416	\$ 395
Annual Benefits	\$58,561	\$11,368	\$15,875	\$0	\$4,168,128	\$4,035,477	\$11,686,826	\$19,976,235
Number of retired members	18	4	4	0	954	897	2,339	4,216

\* Includes 13 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	\$ 4,595	\$ 4,615	\$ 5,188	\$ 5,048	\$ 5,796	\$ 6,306	\$ 6,302	\$ 5,850
Average monthly benefit	\$ 383	\$ 385	\$ 432	\$ 421	\$ 483	\$ 526	\$ 525	\$ 487
Annual Benefits	\$284,914	\$332,278	\$861,189	\$893,482	\$7,500,237	\$4,515,232	\$2,243,334	\$16,630,666
Number of retired members	62	72	166	177	1,294	716	356	2,843

\* Includes 21 members who did not have service reported.

Number counts include 34 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, 2018					
Monthly Benefit	No. of Retirees	1 Person		2 Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	1,530	56	1,433	0	41
501-1,000	110	5	61	16	28
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
<b>Total</b>	<b>1,640</b>	<b>61</b>	<b>1,494</b>	<b>16</b>	<b>69</b>

**Political Subdivision Employees**

June 30, 2018					
Monthly Benefit	No. of Retirees	1 Person		2 Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	1,102	29	1,066	0	7
501-1,000	67	4	35	3	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
<b>Total</b>	<b>1,170</b>	<b>33</b>	<b>1,102</b>	<b>3</b>	<b>32</b>

## Other Schedules of Interest

### Schedule of Retired Members by Type of Benefits

#### Medical Benefits

#### Teachers

June 30, 2018					
Monthly Benefit	No. of Retirees	1-Person		2-Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	3,759	53	3,652	0	54
501-1,000	450	9	125	14	302
1,001-1,500	7	0	4	0	3
1,501-2,000	0	0	0	0	0
Over 2,000	0	0	0	0	0
Total	4,216	62	3,781	14	359

#### Police and Fire

June 30, 2018					
Monthly Benefit	No. of Retirees	1-Person		2-Person	
		Pre-65	Post-65	Pre-65	Post-65
\$1-\$500	1,832	451	1,353	13	15
501-1,000	987	35	259	674	19
1,001-1,500	16	3	3	5	5
1,501-2,000	8	0	0	8	0
Over 2,000	0	0	0	0	0
Total	2,843	489	1,615	700	39

## 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*		
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*		
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

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

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**RETIRED MEMBERSHIP DATA**

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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*		
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

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**FIREFIGHTERS** (aggregate compensation and annual allowance dollars in thousands)

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**RETIRED MEMBERSHIP DATA**

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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*		
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.