

**STATE OF WYOMING RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION REPORT**  
**FOR THE YEAR BEGINNING JANUARY 1, 2017**

April 24, 2017

Board of Trustees  
**State of Wyoming Retirement System**  
6101 Yellowstone Road  
Suite 500  
Cheyenne, WY 82002

Dear Board of Trustees:

**Subject: Actuarial Valuation as of January 1, 2017**

We are pleased to present the report of the actuarial valuation of the State of Wyoming Retirement System (“the Fund”) for the plan year commencing January 1, 2017. This report describes the current actuarial condition of the Fund, determines the calculated employer contribution rate (the actuarially determined contribution rate), and analyzes changes in this contribution rate from the prior year. Valuations are prepared annually, as of January 1, the first day of the Fund’s plan year.

### **Financing objectives and funding policy**

The employer and employee contribution rates are specified in the statute. The purpose of this actuarial valuation is to determine whether or not this statutory contribution is sufficient to meet the obligations of the Fund.

### **Progress toward realization of financing objectives**

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan’s funded status. The funded ratio, based upon the assumption of no further cost-of-living adjustment increases as of January 1, 2017 is 78.14%. In the January 1, 2016 valuation, this funded ratio was 78.21%. On a market value of assets basis, the funded ratio increased from 73.77% as of January 1, 2016 to 73.88% as of January 1, 2017.

### **Benefit provisions**

The benefit provisions reflected in this valuation are those which were in effect on January 1, 2017, including recent legislation that affects benefits for members who join the State of Wyoming Retirement System later than August 31, 2012. W.S. 9-3-454 prohibits benefit changes, including cost-of-living increases, unless the funded ratio stays above 100% plus a margin for adverse experience throughout the life of the benefit change. Therefore, this valuation does not include any liability for future cost-of-living increases.

The benefit provisions are summarized in Appendix B of the report.

### **Assumptions and methods**

Actuarial assumptions and methods are set by the Board, based upon recommendations made by the plan's actuary. The current assumptions used in the actuarial valuation were adopted by the Board effective February 22, 2013 and were first utilized with the January 1, 2014 valuation report. For a detailed description of the experience related to these assumptions as well as the rationale for any changes please see our latest Wyoming Retirement System Actuarial Experience Study Report. Our experience study report was dated February 21, 2013 and it covered the five-year investigation period ending December 31, 2011.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. The actuarial calculations presented in the report are intended to provide information for rational decision making.

The 8.37% employer contribution and the 8.25% employee contribution are the rates that comply with State law. Due to the many factors affecting a retirement system, users of this report should be aware that contributions made at that rate do not necessarily guarantee long-term benefit security.

The employer contribution requirement in Table 1 of this report is determined using the actuarial assumptions and methods disclosed in Appendix A of this report. This report does not include a detailed assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

All assumptions and methods are described in Appendix A of our report.

### **Data**

Member data for retired, active and inactive members was supplied as of January 1, 2017 by the Fund's staff. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data.

Asset and financial information as of January 1, 2017 was prepared by Wyoming Retirement System and is the responsibility of management. Eide Bailly, LLP provided us the asset and financial information and will opine on Wyoming Retirement System's statements.

### **Plan experience**

As part of each valuation, we examine the Fund's experience relative to the assumptions. As experience in a given year deviates from the assumptions, a gain occurs if the liabilities grow slower than the assumption set anticipates and a loss occurs if the liabilities grow faster. This

past fiscal year, the Fund had a total experience loss of approximately \$36 million, composed of a \$63 million investment loss, a \$30 million contribution loss, and a \$57 million liability gain. The gain in liability was primarily due to salary increases being less than expected. The aggregate results of these analyses are disclosed in Tables 4 and 5 under Section III of the report.

#### **Actuarial certification`**

All of the tables contained in this actuarial valuation report were prepared by Gabriel, Roeder, Smith & Company. Historical information for years prior to 2010 was prepared by the prior actuarial firm and was not subjected to our actuarial review.

We certify that the information presented herein is accurate and fairly portrays the actuarial position of the Fund as of January 1, 2017.

All of our work conforms with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of state law and, where applicable, the Internal Revenue Code and ERISA. The undersigned are independent actuaries and consultants. Mark Randall and Leslie Thompson are Enrolled Actuaries and Mark Randall, Leslie Thompson, and Paul Wood are Members of the American Academy of Actuaries, and all three meet all the Qualification Standards of the American Academy of Actuaries.

Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,

**Gabriel, Roeder, Smith & Company**



Mark R. Randall, FCA, EA, MAAA

Chief Executive Officer



Leslie Thompson, FSA, FCA, EA, MAAA

Senior Consultant



Paul T. Wood, ASA, FCA, MAAA

Consultant

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## **SECTION I**

### **EXECUTIVE SUMMARY**

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Executive Summary

Item	January 1, 2017	January 1, 2016
	No COLA	No COLA
1. Contributions:		
a. Total normal cost	11.55%	11.83%
b. Employee contributions	(8.25%)	(8.25%)
c. Net employer normal cost	3.30%	3.58%
d. Amortization payment	5.72%	5.48%
e. Administrative expenses	0.35%	0.32%
f. Required contribution	9.37%	9.38%
g. Statutory contribution	(8.37%)	(8.37%)
h. Shortfall/(surplus)	1.00%	1.01%
2. Funding Elements:		
a. Market value of assets (MVA)	\$6,678,504,705	\$6,427,796,404
b. Actuarial value of assets (AVA)	\$7,063,051,856	\$6,814,919,591
c. Actuarial accrued liability (AAL)	\$9,039,303,831	\$8,713,353,524
d. Unfunded/(overfunded) actuarial accrued liability (UAAL)	\$1,976,251,975	\$1,898,433,933
3. Contributions and Ratios:		
a. Annual required contribution	\$173,551,431	\$174,211,753
b. Actual contributions	N/A	151,488,715
i. Employer	N/A	149,619,229
ii. Other	N/A	1,869,486
c. Percentage contributed	N/A	86.96%
d. Funded ratio on an actuarial basis (AVA/AAL)	78.14%	78.21%
e. Funded ratio on a market basis (MVA/AAL)	73.88%	73.77%
f. Projected payroll	\$1,851,873,634	\$1,858,678,687



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## **SECTION II**

### **DISCUSSION**

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## Contribution Requirements

- Exhibits throughout this report are based primarily, unless stated otherwise, on the assumption of no future cost-of-living adjustments (COLAs).
- W.S. 9-3-454 prohibits benefit changes, including cost-of-living increases, unless the funded ratio stays above 100% plus a margin for adverse experience throughout the life of the benefit change. The actuarial value funded ratio is 78.14% and the market value funded ratio is 73.88%.
- There were no changes in the actuarial assumptions or methods since the prior valuation.
- The amortization payment is based upon the following assumptions:
  - 30-year open funding period
  - Amortization payment amounts are calculated in such a way that they will increase as a level percentage of payroll
  - Total payroll increases are assumed at 4.25% per year, and
  - Future growth in the number of active members is not reflected in the annual valuation
- The analysis of the changes in the contribution rates is shown in Table 5 under Section III of the report
- The calculated funding period assuming the current statutory contribution of 8.37% of pay is 44 years, but does not reflect the expected lower costs for future tier 2 members. Projections that reflect the lower future tier 2 costs show that it will take about 40 years to amortize the unfunded actuarial accrued liability. The increase in the funding period from 39 years as of January 1, 2016 to 40 years as of January 1, 2017 is mainly attributable to the smaller than expected increase in the payroll and the decrease in the future expected contributions. Projection results were produced under separate cover.

## Calculation of Contribution Rates

The funds available to pay benefits come from two sources, contributions and investment income on those contributions (the majority of the funds available to pay benefits typically come from investment income). The Fund receives contributions from two sources, employer contributions and member contributions, both of which are determined as a percentage of pay. As shown in Table 1 under Section III of the report, the employer contribution rate has three components:

- The normal cost percentage (NC%)
- The amortization percentage (UAAL%)
- The administrative expenses

The NC% is the theoretical amount which would be required to pay the members' benefits if this amount had been contributed from each member's entry date and if the fund's experience exactly followed the actuarial assumptions. The NC% is shown in Table 3 under Section III of the report.

Members are required to make employee contributions and only the excess of the NC% over the member contribution rate is included in the employer contribution rate.

The actuarial accrued liability (AAL) is the difference between (i) the actuarial present value of all future benefits for all current participants of the fund, including active, inactive and retired members, and (ii) the actuarial present value of future normal costs. Thus, the AAL represents the liability associated with past years. The unfunded actuarial accrued liability (UAAL) is the difference between the AAL and the actuarial value of assets (AVA). It is the shortfall/excess between the liability associated with prior years (the AAL) and the assets actually accumulated (the AVA). This shortfall/excess can arise from several sources, including actuarial gains and losses which are caused by differences between actual experience and the plan's assumptions, changes to the plan's actuarial assumptions, and amendments to the benefit provisions.

The UAAL% is the amount required to fund this difference. It is the amount, expressed as a level percentage of payroll, necessary to amortize the UAAL. This amortization is over a period of 30 years beginning January 1, 2017. The Executive Summary shows the UAAL%, called Amortization Payment, compared to that of last year.

Assumed administrative expenses are the average of the prior two years, with each year projected at 6.5% to the valuation date.

The calculated rate is used in determining the contributions necessary to meet the Actuarially Determined Contribution for the twelve-month period beginning January 1, 2017. As of January 1, 2017, the employer contribution is within 1.00% of meeting the Actuarially Determined Contribution. The current shortfall in contribution is expected to persist for some time.

## Financial Data and Experience

As of January 1, 2017, the Fund has a total market value of \$6,679 million. Financial information was received from Eide Bailly, LLP.

Table 7 under Section III of the report shows a reconciliation of the market values between the beginning and end of 2016.

During 2016, the total investment return on the market value of assets (MVA), as reported by Meketa Investment Group, Inc., was 7.60%, as shown in Table 10 under Section III of the report.

In determining the contribution rates and funded status of the Fund, an actuarial value of assets (AVA) is used rather than the market value of assets. The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (or less than) expected investment income. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses. An adjustment is made if the actuarial value is not within 20% of the Market Value. For any year following a year in which the 20% of market value adjustment was applied, the actuarial value is determined as if the adjustment was not applied in the previous year.

The development of the AVA is shown in Table 9 under Section III of the report. The AVA is \$7.1 billion. The AVA is 105.76% of the MVA as of December 31, 2016, compared to 106.02% last year. The difference between the AVA and the MVA is the deferred gains and losses. As of January 1, 2016, the total deferred loss was \$387 million. As of January 1, 2017, the total deferred loss was \$385 million. Having a deferred loss in the AVA is an indicator that the funded ratio will have a downward “tilt” in the near term, and contribution requirements will likewise have upward pressure.

In addition to the market return, Table 10 also shows the return on the actuarial value of assets for the Fund. For 2016, this return was 6.74%. Since this return is less than the assumed 7.75% investment return, an actuarial loss occurred increasing the unfunded actuarial accrued liabilities of the Fund by \$63.2 million.

## Member Data

Member data as of January 1, 2017 was supplied electronically by the Fund's staff. While we did not audit this data, we did perform various tests to ensure that it was internally consistent, consistent with the prior year's data, and was reasonable overall.

Table 15 under Section III of the report shows the number of members by category (active, inactive, retired, etc.) along with member statistics. Tables 16 through 28 show summaries of certain historical data and include membership statistics.

Total active member payroll decreased 0.37% last year, compared to an increase of 2.23% from the prior year.

Of the 35,892 active participants, 6,152 are eligible or will become eligible for unreduced retirement and 7,461 are eligible or will become eligible for reduced retirement in 2017.

The average of the final average salaries for participants who retired or became disabled this year is \$51,594.

Changes in payroll are significant because the methodology used in the valuation to amortize the unfunded actuarial accrued liability assumes a growing payroll into the future. If the payroll does not grow at the assumed 4.25% per year average, then the current amortization payments may be understated and the funding position of the Fund will not strengthen as assumed over time. Higher than expected payroll growth, however, has the opposite effect of this and the funded position of the Fund should trend toward 100%. Table 5 under Section III of the report shows, for the past year, payroll for the plan increased less than expected so the effect is an increase in the calculated contribution rate of 0.26% of payroll.

One reason payroll increased less than expected is that the salary, for continuing active participants, increased less than expected. This represented a gain to the Plan, as shown in Table 4 under Section III of the report.

## Benefit Provisions

Appendix B of the report includes a more detailed summary of the benefit provisions for the Fund. A brief summary is as follows:

A new tier of benefits was signed into law on March 23, 2012 and is effective for new members joining the System on or after September 1, 2012.

– *Tier*

- Members who join the State of Wyoming Retirement System by August 31, 2012 are in Tier 1, while members who join later are in Tier 2

– *Normal Retirement Eligibility*

- For Tier 1 member - Age 60 with at least four years of service
- For Tier 2 member - Age 65 with at least four years of service

– *Normal Retirement Benefit*

- For Tier 1 member - 2.125% of employee's Highest Average Salary for each year of credited service for the first 15 years of service credit plus 2.25% of Highest Average Salary for any years of service credit exceeding 15 years. This amount is reduced by 5.0% per year that the employee is under age 60.
- For Tier 2 member - 2.00% of employee's Highest Average Salary for each year of credited service. This amount is reduced by 5.0% per year that the employee is under age 65.

However, members retiring with a combined age and service of at least 85 receive an unreduced benefit. Employees hired prior to July 1, 1981 may be entitled to benefits earned under a different formula.

– *Normal Form of Payment*

- Monthly benefit for life with a lump-sum death benefit equal to the excess (if any) of the employee contributions with interest over the total benefits received.

– *Employee Contributions* are required

- 8.25% of pay.

– *Post-retirement Cost-of-Living Adjustments (COLAs)*

- W.S. 9-3-454 prohibits benefit changes, including cost-of-living increases, unless the funded ratio stays above 100% plus a margin for adverse experience throughout the life of the benefit change.

## Actuarial Methods and Assumptions

Appendix A of the report includes a summary of the actuarial assumptions and methods used in this valuation. A few highlights are listed as follows:

- Costs are determined using the Entry Age Normal actuarial cost method, calculated as a level percentage of payroll.
- The unfunded actuarial accrued liability is amortized over an open 30 year period as a level percent of payroll.
- The assumed annual investment return rate is 7.75%, with assumed inflation of 3.25%.
- Payroll is assumed to increase at 4.25% per year.
- Inactive vested participants are assumed to retire at age 60 (65 for Tier 2) or on the valuation date if older.
- The benefit amount is not available for members entitled to deferred benefits. The benefit amount and present value of benefits expected to be paid to vested inactive non-retired members is approximated using the data provided.

The average future lifetime for current pensioners is 15.5 years.

There have been no changes in actuarial assumptions or methods since the prior valuation.

The actuarial assumptions and methods will be reviewed in detail as part of the 2017 Experience Study covering the five year period ending December 31, 2016.

### **GASB and Funding Progress**

Governmental Accounting Standards Board Statement Number 67 (GASB 67) contains certain accounting requirements for the Fund. Schedules, notes and required supplementary information are provided under separate cover.



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## **SECTION III**

### **SUPPORTING EXHIBITS**

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**Calculation of Annual Required Contribution Rate**  
*(Assumes No Future Cost-Of-Living Increases)*

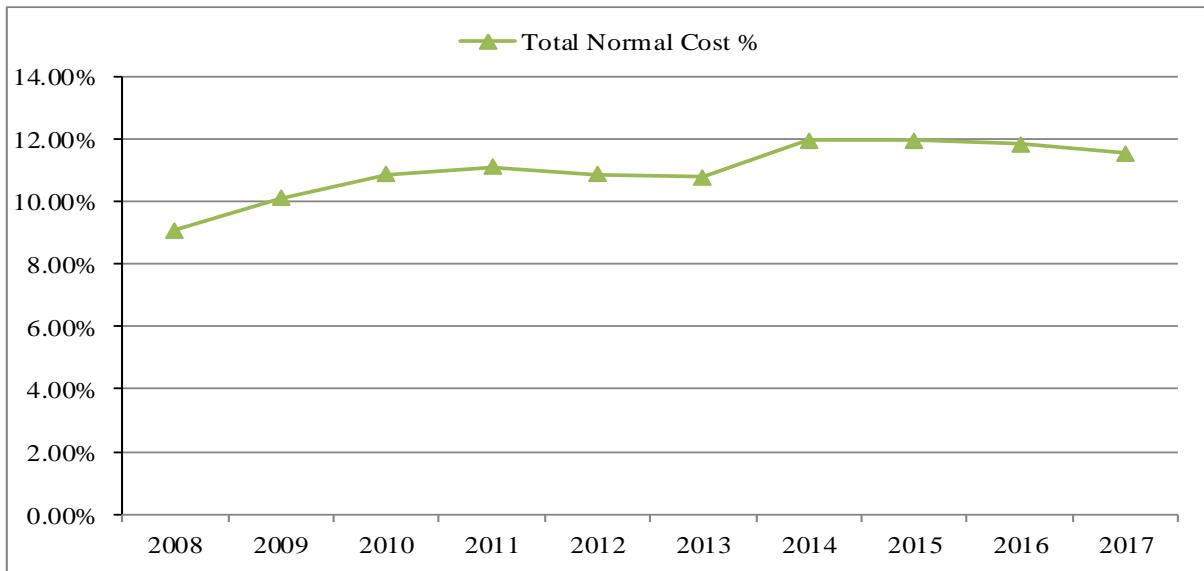
Item	January 1, 2017	January 1, 2016
1. Projected valuation payroll	\$1,851,873,634	\$1,858,678,687
2. Present value of future pay	\$14,482,995,426	\$14,398,827,135
3. Employer normal cost rate	3.30%	3.58%
4. Actuarial accrued liability for active members		
a. Present value of future benefits for active members	\$5,386,064,760	\$5,457,234,672
b. Less: present value of future employer normal costs	(407,277,588)	(453,353,302)
c. Less: present value of future employee contributions	(1,194,847,124)	(1,187,903,241)
d. Actuarial accrued liability	\$3,783,940,048	\$3,815,978,129
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	\$4,843,818,947	\$4,508,717,973
b. Disabled members	32,518,140	33,478,858
c. Inactive members	379,026,696	355,178,564
d. Active members (Item 4d)	3,783,940,048	3,815,978,129
e. Total	\$9,039,303,831	\$8,713,353,524
6. Actuarial value of assets (Table 9)	\$7,063,051,856	\$6,814,919,591
7. Unfunded actuarial accrued liability (UAAL) (Item 5e - Item 6)	\$1,976,251,975	\$1,898,433,933
8. UAAL amortization period	30 years	30 years
9. Assumed payroll growth rate	4.25%	4.25%
10. Employer contribution requirement		
a. UAAL amortization payment as % of pay	5.72%	5.48%
b. Employer normal cost	3.30%	3.58%
c. Administrative expense	0.35%	0.32%
d. Contribution requirement (a + b + c)	9.37%	9.38%

**Cost Breakdown**  
*(Assumes No Future Cost-Of-Living Increases)*

Item	Present Value of Future Normal Costs (1)	Actuarial Accrued Liabilities (2)	Total Present Value of Benefits (3) = (1) + (2)
Age and service allowances based on total service and disability benefits likely to be rendered by present active members	\$1,279,554,987	\$3,791,533,341	\$5,071,088,328
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	23,415,715	55,744,641	79,160,356
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	299,154,010	(63,337,934)	235,816,076
Benefits likely to be paid to vested inactive members	0	324,807,358	324,807,358
Benefits to be paid to members due refunds	0	54,219,338	54,219,338
Benefits to be paid to current retirees, disabled members, beneficiaries, and future beneficiaries of current retirees	0	4,876,337,087	4,876,337,087
<b>Total</b>	<b>\$1,602,124,712</b>	<b>\$9,039,303,831</b>	<b>\$10,641,428,543</b>
Actuarial value of assets	0	7,063,051,856	7,063,051,856
Liabilities to be covered by future contributions	\$1,602,124,712	\$1,976,251,975	\$3,578,376,687

**History of Total Normal Cost**  
*(Assumes No Future Cost-Of-Living Increases)*

<u>Fiscal Year Ending December 31</u>	<u>Normal Cost as Percent of Payroll</u>
(1)	(2)
2008	9.08%
2009	10.10%
2010	10.86%
2011	11.11%
2012	10.86%
2013	10.77%
2014	11.96%
2015	11.96%
2016	11.83%
2017	11.55%



**Calculation of Total Actuarial Gain/(Loss)**  
*(Assumes No Future Cost-Of-Living Increases)*

Item	January 1, 2017
1. Derivation of Experience Gain/(Loss)	
a. Unfunded actuarial accrued liability (UAAL) - previous valuation	\$1,898,433,933
b. Normal cost (NC) for fiscal year ending December 31, 2016	219,893,113
c. Actual administrative expenses for fiscal year ending December 31, 2016	6,305,865
d. Actuarially determined contribution for fiscal year ending December 31, 2016	327,552,745
e. Interest accrual:	
(i) For whole year on (a)	147,128,630
(ii) For half year on (b) + (c) - (d)	(3,927,458)
(iii) Total interest: (e)(i) + (e)(ii)	143,201,172
f. Change in UAAL due to plan changes	-
g. Change in UAAL due to assumption change	-
h. Expected UAAL current year: (a) + (b) + (c) - (d) + (e)(iii) + (f) + (g)	1,940,281,337
i. Actual UAAL current year	1,976,251,975
j. Experience gain/(loss): (h) - (i)	(35,970,638)
k. Experience gain/(loss) as a % of actuarial accrued liability	-0.40%
2. Approximate portion of gain/(loss) due to investments (at actuarial value)	(\$63,156,384)
3. Approximate portion of gain/(loss) due to contributions higher or lower than expected	(\$29,515,346)
4. Approximate amount of gain/(loss) due to liabilities: (1)(j) - (2) - (3)	\$56,701,092
a. Age & service retirements	(\$15,804,821)
b. Disability retirements	(272,121)
c. Death-in-service	(1,174,942)
d. Withdrawal from employment	(6,301,034)
e. Rehires	(1,243,773)
f. Pay increases	102,884,494
g. Death after retirement	(3,657,224)
h. Other	(17,729,487)
i. Other as a % of actuarial accrued liability	-0.20%

**Change in Calculated Contribution Rate Since the Prior Valuation**  
*(Assumes No Future Cost-Of-Living Increases)*

Item	January 1, 2017
1. Calculated contribution rate as of January 1, 2016	9.38%
2. Change in contribution rate during year	
a. Change in employer normal cost	-0.28%
b. Assumption changes to accrued liability	0.00%
c. Actuarial (gain) loss from investments on actuarial value of assets	0.18%
d. Actuarial (gain) loss from liability sources & administrative expenses	-0.13%
e. Difference between contributions made and required contribution	0.08%
f. Effect of payroll growing (faster)/slower than assumption	0.26%
g. Open amortization period reset to 30 years	-0.12%
h. Other changes	0.00%
i. Total change	-0.01%
3. Calculated contribution rate as of January 1, 2017	9.37%

Statement of Plan Net Assets

Assets at Market Value		
Item	FYE 2016	FYE 2015
1. Cash and Cash Equivalents (Operating Cash)	\$669,094,103	\$448,938,019
2. Receivables		
a. Insurance premium tax	\$0	\$0
b. Buy backs	0	0
c. Employer contributions	10,792,048	10,619,148
d. Employee contributions	10,641,676	10,478,793
e. Securities sold	36,170,940	0
f. Accrued interest and dividends	11,931,221	12,519,746
g. Currency contract receivable	2,428,780,024	2,902,530,772
h. Other	109,053	31,348,026
i. Rebate and fee income receivable	0	0
j. Total receivables	<u>\$2,498,424,962</u>	<u>\$2,967,496,485</u>
3. Investments, at Fair Value	\$6,320,501,259	\$6,304,087,156
4. Liabilities		
a. Benefits and refunds payable	(\$791,264)	(\$560,862)
b. Securities purchased	(23,674,013)	(53,039,267)
c. Administrative and consulting fees payable	(6,948,792)	(11,158,993)
d. Currency contract payable	(2,405,441,442)	(2,896,878,756)
e. Securities lending collateral	<u>(372,660,108)</u>	<u>(331,087,378)</u>
f. Total liabilities	<u>(\$2,809,515,619)</u>	<u>(\$3,292,725,256)</u>
5. Total Market Value of Assets Available for Benefits	\$6,678,504,705	\$6,427,796,404

Reconciliation of Plan Net Assets

Assets at Market Value		
Item	FYE 2016	FYE 2015
A. Market Value of Assets at Beginning of Year	\$6,427,796,404	\$6,672,165,875
B. Contribution Income:		
1. Contributions		
a. Employee	\$147,649,738	\$147,360,099
b. Employer	149,619,229	142,665,839
c. Other	6,642,286	8,125,569
d. Total	\$303,911,253	\$298,151,507
2. Investment Income		
a. Interest, dividends, and other income	\$132,340,455	\$151,712,323
b. Net appreciation	351,707,235	(181,911,723)
c. Investment expenses	(31,385,672)	(38,944,573)
d. Net investment income	\$452,662,018	\$(69,143,973)
3. Securities Lending		
a. Gross income	\$2,939,277	\$2,321,226
b. Deductions	(888,302)	(332,895)
c. Net investment income	\$2,050,975	\$1,988,331
4. Benefits and Refunds		
a. Refunds	\$(18,127,974)	\$(19,365,045)
b. Regular monthly benefits	(483,482,106)	(450,589,769)
c. Total	\$(501,610,080)	\$(469,954,814)
5. Administrative and Miscellaneous Expenses	\$(6,305,865)	\$(5,410,522)
C. Market Value of Assets at End of Year	\$6,678,504,705	\$6,427,796,404



Progress of Fund Through December 31, 2016

Plan Year Ending December 31	Employer Contributions*	Employee Contributions*	Administrative Expenses	Net Investment Income**	Benefit Payments	Transfers	Actuarial Value of Assets
Total	\$ 2,327,040,115	\$ 2,157,321,055	\$ (69,828,034)	\$ 8,119,523,054	\$ (6,121,487,795)	\$ (115,633,895)	
1986	\$ 41,364,465	\$ 36,365,804	\$ (782,000)	\$ 98,998,090	\$ (42,082,765)	\$ -	\$ 900,097,591
1987	39,901,834	36,039,418	(808,023)	91,374,783	(50,604,364)	-	1,016,001,239
1988	38,414,939	33,222,264	(444,343)	103,025,282	(48,627,479)	-	1,141,591,902
1989	36,139,394	36,231,108	(424,136)	128,370,680	(55,459,353)	-	1,286,449,595
1990	38,668,634	38,960,372	(850,148)	114,218,588	(61,154,261)	-	1,416,292,780
1991	38,903,350	39,288,267	(863,301)	148,164,188	(69,348,501)	-	1,572,336,783
1992	42,354,843	42,883,874	(909,653)	175,246,400	(75,211,430)	-	1,756,700,817
1993	41,596,571	42,266,219	(801,026)	189,281,426	(82,480,713)	-	1,946,563,294
1994	42,791,243	43,415,880	(888,518)	136,210,578	(89,707,717)	-	2,078,384,760
1995	43,714,263	44,435,762	(937,480)	230,731,781	(99,689,985)	-	2,296,639,101
1996	43,495,146	44,761,611	(1,028,163)	233,212,720	(108,536,621)	-	2,508,543,794
1997	44,958,544	46,152,691	(1,147,818)	314,340,179	(117,126,096)	-	2,795,721,294
1998	46,183,091	47,366,181	(1,074,562)	436,098,461	(123,858,991)	-	3,200,435,474
1999	48,681,209	50,106,535	(1,182,899)	475,758,627	(132,428,572)	-	3,641,370,374
2000	50,539,675	51,868,059	(1,096,747)	592,379,739	(144,620,949)	-	4,190,440,151
2001	56,517,377	53,792,429	(1,387,930)	439,286,379	(156,189,100)	-	4,582,462,306
2002	57,377,428	58,234,324	(1,281,554)	(66,209,697)	(171,160,286)	(106,978,719)	4,352,423,802
2003	55,363,788	60,848,296	(1,435,922)	376,524,142	(185,826,481)	-	4,657,897,625
2004	60,573,670	61,412,824	(1,644,382)	127,831,761	(201,772,174)	-	4,704,299,324
2005	65,191,670	63,381,309	(1,930,627)	238,882,774	(217,308,520)	(8,655,176)	4,843,861,114
2006	72,664,403	69,020,297	(1,949,051)	409,948,934	(232,944,164)	-	5,160,601,533
2007	83,149,236	78,495,298	(2,005,783)	583,547,681	(249,765,088)	-	5,654,022,877
2008	88,451,655	84,814,014	(2,778,990)	(720,402,274)	(268,232,301)	-	4,835,874,981
2009***	244,063,923	89,298,711	(3,081,105)	868,641,735	(292,256,569)	-	5,742,541,676
2010	104,757,666	99,291,423	(3,600,747)	170,797,772	(314,256,856)	-	5,799,530,934
2011	122,557,906	116,691,540	(5,541,488)	71,962,242	(343,979,208)	-	5,761,221,926
2012	124,648,088	119,052,404	(6,463,506)	126,138,774	(374,629,714)	-	5,749,967,972
2013	128,277,269	122,611,180	(6,513,680)	654,726,838	(404,568,029)	-	6,244,501,550
2014	129,627,747	141,061,289	(5,258,065)	535,776,435	(436,096,614)	-	6,609,612,342
2015	144,622,373	153,529,134	(5,410,522)	382,521,078	(469,954,814)	-	6,814,919,591
2016	151,488,715	152,422,538	(6,305,865)	452,136,957	(501,610,080)	-	7,063,051,856

\* Employer contributions include other funding sources and employee contributions may include member redeposits and member service purchase contributions

\*\* Net of investment expenses

\*\*\* December 31, 2009 market values exclude Air Guard Firefighters

**Development of Actuarial Value of Assets**

Item	FYE 2016	FYE 2015
1. Actuarial value of assets, beginning of year (without corridor)	\$6,814,919,591	\$6,609,612,342
2. Market value, end of year	\$6,678,504,705	\$6,427,796,404
3. Market value, beginning of year	\$6,427,796,404	\$6,672,165,875
4. Non-investment/administrative net cash flow:		
a. Employee contributions	\$147,649,738	\$147,360,099
b. Employer contributions	149,619,229	142,665,839
c. Other contributions	6,642,286	8,125,569
d. Refund of employee accounts	(18,127,974)	(19,365,045)
e. Retirement benefits	(483,482,106)	(450,589,769)
f. Administrative expenses	(6,305,865)	(5,410,522)
g. Total net cash flow: [sum of (4a) through (4f)]	(\$204,004,692)	(\$177,213,829)
5. Investments and securities lending:		
a. Interest and dividends on investments	\$132,340,455	\$151,712,323
b. Gross income from securities lending	2,939,277	2,321,226
c. Fees and expenses	(32,273,974)	(39,277,468)
d. Total net income: [sum of (5a) through (5c)]	\$103,005,758	\$114,756,081
6. Investment income:		
a. Actual market return: (2) - (3) - (4g) - (5d)	\$351,707,235	(\$181,911,723)
b. Assumed rate of return	7.75%	7.75%
c. Assumed amount of return	387,390,782	395,597,869
d. Amount subject to phase-in: (6a) - (6c)	(\$35,683,547)	(\$577,509,592)
7. Phase-in recognition of investment income:		
a. Current year: 0.20 * (6d)	(\$7,136,709)	(\$115,501,918)
b. First prior year	(115,501,918)	(36,197,052)
c. Second prior year	(36,197,052)	62,899,547
d. Third prior year	62,899,547	60,680,168
e. Fourth prior year	60,680,168	(99,713,617)
f. 2011 market value adjustment not previously recognized	(3,003,619)	-
g. Total recognition	(\$38,259,583)	(\$127,832,872)
<b>8. Actuarial value of assets, end of year</b>		
a. Preliminary actuarial value of assets, end of year: (1) + (4g) + (5d) + (6c) + (7g)	\$7,063,051,856	\$6,814,919,591
b. Upper corridor limit: 120% * (2)	8,014,205,646	7,713,355,685
c. Lower corridor limit: 80% * (2)	5,342,803,764	5,142,237,123
d. Actuarial value of assets, end of year	\$7,063,051,856	\$6,814,919,591
9. Difference between market and actuarial value of assets	(\$384,547,151)	(\$387,123,187)
<b>10. Actuarial rate of return</b>	6.74%	5.87%
<b>11. Market rate of return*</b>	7.60%	-0.26%
<b>12. Ratio of actuarial value to market value of assets</b>	105.76%	106.02%

\* Current year market rate of return is based on unaudited data and is supplied by the plan's investment consultant.

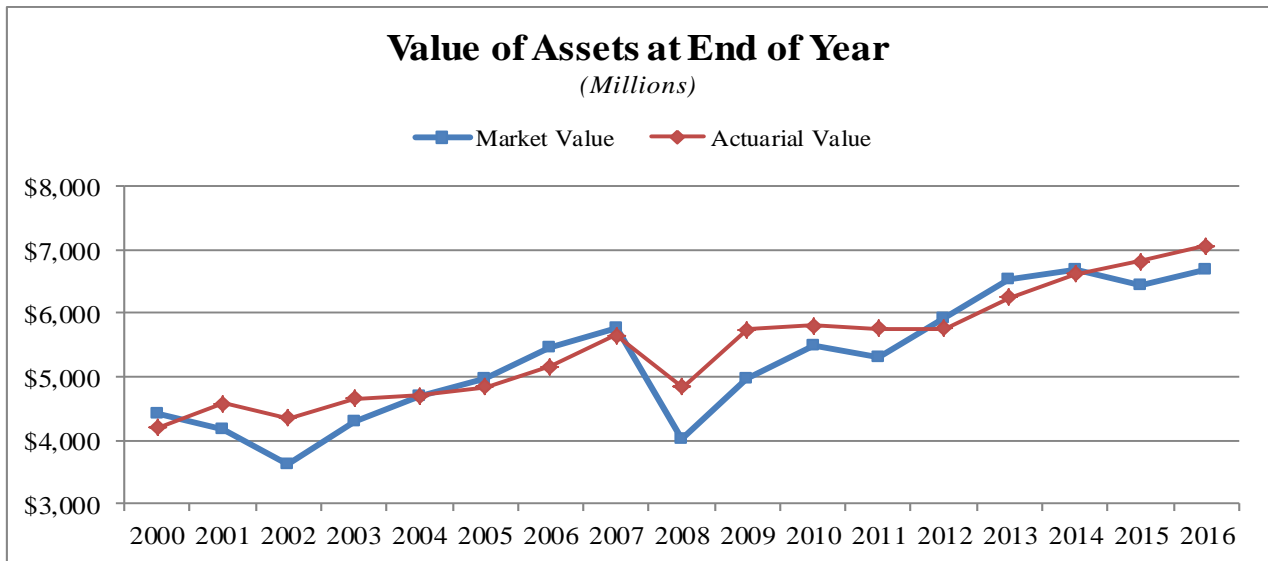
### History of Investment Returns

Plan Year (1)	Market Value (2)	Actuarial Value (3)
2000	-0.99%	16.37%
2001	-4.47%	10.54%
2002	-9.29%	-1.47%
2003	21.00%	8.72%
2004	11.54%	2.77%
2005	8.22%	5.13%
2006	12.63%	8.55%
2007	7.44%	11.41%
2008	-29.63%	-12.85%
2009	23.72%	17.89%
2010	13.80%	3.00%
2011	-0.90%	1.25%
2012	14.05%	2.22%
2013	13.53%	11.55%
2014	4.70%	8.70%
2015	-0.26%	5.87%
2016	7.60%	6.74%

**Average returns:**

Last five years:	7.79%	6.97%
Last ten years:	4.38%	5.27%

The market returns above are gross of investment expenses and were provided by the plan's investment consultant. The actuarial returns above are based on the financial information provided by the plan's auditors.



**Solvency Test**

Valuation Date January 1	Total Active Member Contributions (1)	Inactive and Pensioner Liability (2)	Employer Financed Active Accrued Liability (3)	Actuarial Value of Assets	Percentage of Liabilities Covered by Assets		
					(1)	(2)	(3)
2005	\$840,104,000	\$2,592,159,000	\$2,103,929,000	\$4,704,299,324	100%	100%	60.5%
2006	888,544,000	2,354,500,000	1,848,710,000	4,843,861,114	100%	100%	86.6%
2007	941,572,000	2,488,504,000	2,038,153,000	5,160,601,533	100%	100%	84.9%
2008	991,444,000	2,699,505,000	2,325,036,000	5,654,022,877	100%	100%	84.4%
2009	1,036,443,231	2,796,308,000	2,319,370,769	4,835,874,981	100%	100%	43.2%
2010	1,109,001,753	2,933,630,669	2,519,698,185	5,742,541,676	100%	100%	67.3%
2011	1,161,508,226	3,178,244,317	2,515,890,340	5,799,530,934	100%	100%	58.0%
2012	1,226,273,201	3,455,740,883	2,355,172,581	5,761,221,926	100%	100%	45.8%
2013	1,286,009,555	3,724,948,051	2,308,247,120	5,749,967,972	100%	100%	32.0%
2014	1,333,532,543	4,251,120,151	2,460,394,278	6,244,501,550	100%	100%	26.8%
2015	1,394,083,171	4,600,839,298	2,375,744,013	6,609,612,342	100%	100%	25.9%
2016	1,472,111,790	4,897,375,395	2,343,866,339	6,814,919,591	100%	100%	19.0%
2017	1,491,204,773	5,255,363,783	2,292,735,275	7,063,051,856	100%	100%	13.8%

*Excludes Air Guard beginning in 2010*

*Effective January 1, 2010, liabilities are calculated assuming no future cost-of-living increases.*

Schedule of Funding Progress

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Valuation Date January 1	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Unfunded AAL (UAAL) [(3) - (2)]	Funded Ratio [(2)/(3)]	Covered Payroll	UAAL as a Percentage of Covered Payroll [(4)/(6)]
2001	\$4,190,440,151	\$3,683,174,000	(\$507,266,151)	113.77%	\$897,641,000	(56.51%)
2002	4,582,462,306	4,442,033,000	(140,429,306)	103.16%	964,121,000	(14.57%)
2003	4,352,423,802	4,718,618,000	366,194,198	92.24%	988,135,000	37.06%
2004	4,657,897,625	5,077,443,000	419,545,375	91.74%	1,032,259,000	40.64%
2005	4,704,299,324	4,902,322,000	198,022,676	95.96%	1,086,736,000	18.22%
2006	4,843,861,114	5,091,763,000	247,901,886	95.13%	1,156,400,000	21.44%
2007	5,160,601,533	5,468,229,000	307,627,467	94.37%	1,285,096,000	23.94%
2008	5,654,022,877	6,015,985,000	361,962,123	93.98%	1,462,474,000	24.75%
2009	4,835,874,981	6,152,122,000	1,316,247,019	78.60%	1,585,728,000	83.01%
2010	5,742,541,676	6,562,330,607	819,788,931	87.51%	1,697,341,384	48.30%
2011	5,799,530,934	6,855,642,883	1,056,111,949	84.59%	1,728,433,786	61.10%
2012	5,761,221,926	7,037,186,665	1,275,964,739	81.87%	1,756,856,648	72.63%
2013	5,749,967,972	7,319,204,726	1,569,236,754	78.56%	1,782,069,208	88.06%
2014	6,244,501,550	8,045,046,972	1,800,545,422	77.62%	1,782,062,471	101.04%
2015	6,609,612,342	8,370,666,482	1,761,054,140	78.96%	1,818,197,022	96.86%
2016	6,814,919,591	8,713,353,524	1,898,433,933	78.21%	1,858,678,687	102.14%
2017	7,063,051,856	9,039,303,831	1,976,251,975	78.14%	1,851,873,634	106.72%

Excludes Air Guard beginning in 2010

Effective January 1, 2010, liabilities are calculated assuming no future cost-of-living increases.

**Schedule of Contributions from the Employer(s) and Other Contributing Entities**

(1)	(2)	(3)	(4)	(5)	(6)
Fiscal Year Ending December 31	Actuarially Determined Contribution		Employer Contributions*		Percentage of Actuarially Determined Contribution Contributed
	% of Payroll	Amount	% of Payroll	Amount	[(5)/(3)]
2004	8.76%	\$90,477,000	5.87%	\$60,573,670	66.95%
2005	10.00%	108,707,000	6.00%	65,191,670	59.97%
2006	5.68%	65,714,000	6.28%	72,664,403	110.58%
2007	5.68%	73,035,000	6.47%	83,149,236	113.85%
2008	5.68%	83,036,000	6.05%	88,451,655	106.52%
2009	9.15%	145,015,000	15.39%	244,063,923**	168.32%
2010	8.06%	136,689,664	6.17%	104,757,666	76.64%
2011	7.60%	131,260,466	7.09%	122,557,906	93.37%
2012	8.04%	141,299,725	7.09%	124,648,088	88.22%
2013	8.86%	158,013,754	7.20%	128,277,269	81.18%
2014	10.28%	183,086,430	7.27%	129,627,747	70.80%
2015	9.26%	168,411,742	8.12%	144,622,373	85.87%
2016	9.38%	174,211,753	8.15%	151,488,715	86.96%
2017	9.37%	173,551,431	-	-	-

*Excludes Air Guard beginning December 31, 2009, including Employer Contributions of \$149,244 as of December 31, 2009.*

*Effective January 1, 2010, liabilities are calculated assuming no future cost-of-living increases.*

\* Includes other funding sources but excludes member redeposits and member service purchase contributions.

\*\* There was a \$150.6 million legislative appropriation to address the increase in school district employee pay.

Reconciliation of Participant Data

	Active Participants		Vested Former Participants	Retired Participants	Disabled	Beneficiaries	Participants Due Refunds	Total
	Tier 1	Tier 2						
<b>Number as of January 1, 2016</b>	<b>25,633</b>	<b>10,944</b>	<b>6,096</b>	<b>22,188</b>	<b>244</b>	<b>2,296</b>	<b>21,196</b>	<b>88,597</b>
New participants	-	3,102	1	-	-	-	435	3,538
Vested terminations	(823)	(36)	864	-	-	-	(5)	-
Retirements	(1,228)	(1)	(323)	1,553	-	-	(1)	-
Disability	(6)	-	(2)	-	8	-	-	-
Deceased with beneficiary	(7)	(1)	(7)	(173)	(6)	194	-	-
Deceased without beneficiary	(20)	(8)	(37)	(414)	(6)	(122)	(42)	(649)
Due refunds	(69)	(1,508)	(7)	-	-	-	1,584	-
Lump sum payoffs	(219)	(380)	(151)	-	-	-	(592)	(1,342)
Rehires/return to active	140	379	(143)	(1)	-	-	(294)	81
Certain period expired	-	-	-	-	-	(5)	-	(5)
Reclassifications	(13)	13	-	1	-	-	-	1
Data corrections	-	-	-	2	-	9	-	11
<b>Number as of January 1, 2017</b>	<b>23,388</b>	<b>12,504</b>	<b>6,291</b>	<b>23,156</b>	<b>240</b>	<b>2,372</b>	<b>22,281</b>	<b>90,232</b>

Demographic Statistics

	January 1		Change
	2017	2016	
<u>Active Participants</u>			
Number	35,892	36,577	-1.9%
<i>Vested</i>	23,931	24,084	
<i>Not vested</i>	11,961	12,493	
Average age (years)	46.26	46.24	0.0%
Average service (years)	9.98	9.93	0.5%
Average entry age (years)	36.28	36.31	-0.1%
Total payroll*	\$1,851,873,634	\$1,858,678,687	-0.4%
Average payroll*	\$51,596	\$50,816	1.5%
Total employee contributions with interest	\$1,491,204,773	\$1,472,111,790	1.3%
Average employee contributions with interest	\$41,547	\$40,247	3.2%
<u>Vested Former Participants</u>			
Number	6,291	6,096	3.2%
Average age (years)	51.64	51.96	-0.6%
Total employee contributions with interest	\$208,143,994	\$197,288,124	5.5%
Average employee contributions with interest	\$33,086	\$32,364	2.2%
<u>Service Retirees</u>			
Number	23,156	22,188	4.4%
Average age (years)	71.71	71.59	0.2%
Total annual benefits	\$458,510,406	\$426,230,974	7.6%
Average annual benefit	\$19,801	\$19,210	3.1%
<u>Disability Retirees</u>			
Number	240	244	-1.6%
Average age (years)	64.19	63.75	0.7%
Total annual benefits	\$3,733,643	\$3,808,599	-2.0%
Average annual benefit	\$15,557	\$15,609	-0.3%
<u>Beneficiaries</u>			
Number	2,372	2,296	3.3%
Average age (years)	75.92	75.72	0.3%
Total annual benefits	\$32,796,262	\$30,863,911	6.3%
Average annual benefit	\$13,826	\$13,442	2.9%
<u>Participants Due Refunds</u>			
Number	22,281	21,196	5.1%
Total Refunds Due	\$54,219,338	\$48,461,353	11.9%

\* Projected payroll for the upcoming valuation year



**Distribution of Male Active Members by Age and by Years of Service**

Average Age = 46.9      Average Service = 10.3

Age Last Birthday		Whole Years of Service at Valuation Date							Totals
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
<b>Less than 20</b>	Count	17	-	-	-	-	-	-	17
	Avg. Salary	\$28,685	-	-	-	-	-	-	\$28,685
<b>20-24</b>	Count	337	2	-	-	-	-	-	339
	Avg. Salary	32,965	*	-	-	-	-	-	32,988
<b>25-29</b>	Count	848	119	2	-	-	-	-	969
	Avg. Salary	43,561	\$50,560	*	-	-	-	-	44,427
<b>30-34</b>	Count	776	460	95	3	-	-	-	1,334
	Avg. Salary	47,957	56,915	\$60,263	*	-	-	-	51,922
<b>35-39</b>	Count	613	474	338	69	-	-	-	1,494
	Avg. Salary	49,206	61,736	65,366	\$67,934	-	-	-	57,702
<b>40-44</b>	Count	518	377	320	228	42	-	-	1,485
	Avg. Salary	49,877	62,345	65,955	70,473	\$67,752	-	-	60,175
<b>45-49</b>	Count	476	333	281	276	227	57	3	1,653
	Avg. Salary	47,289	57,332	65,430	70,943	77,222	\$74,682	*	61,433
<b>50-54</b>	Count	448	325	272	212	201	225	89	1,772
	Avg. Salary	47,322	55,322	60,928	64,403	73,920	76,692	\$71,122	60,863
<b>55-59</b>	Count	391	315	281	251	194	213	233	1,878
	Avg. Salary	45,735	53,805	59,185	62,972	71,465	72,080	76,491	60,867
<b>60-64</b>	Count	307	247	220	159	95	116	220	1,364
	Avg. Salary	44,407	54,439	59,222	55,721	65,686	71,143	77,632	59,047
<b>65-69</b>	Count	152	83	94	50	38	34	50	501
	Avg. Salary	30,887	48,576	56,568	59,634	66,143	76,534	74,550	51,634
<b>70 &amp; Over</b>	Count	59	33	27	19	13	3	22	176
	Avg. Salary	24,686	36,866	43,187	48,809	55,149	*	69,234	41,680
<b>Totals</b>	Count	<b>4,942</b>	<b>2,768</b>	<b>1,930</b>	<b>1,267</b>	<b>810</b>	<b>648</b>	<b>617</b>	<b>12,982</b>
	Avg. Salary	<b>\$45,149</b>	<b>\$56,992</b>	<b>\$62,238</b>	<b>\$65,278</b>	<b>\$72,306</b>	<b>\$74,151</b>	<b>\$75,652</b>	<b>\$56,771</b>

Average salary represents annualized salary earned in 2016 and is not shown for cells with counts less than or equal to three participants

**Distribution of Female Active Members by Age and by Years of Service**

Average Age = 45.9      Average Service = 9.8

Age Last Birthday		Whole Years of Service at Valuation Date							Totals
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
<b>Less than 20</b>	Count	43	-	-	-	-	-	-	43
	Avg. Salary	\$17,284	-	-	-	-	-	-	\$17,284
<b>20-24</b>	Count	690	4	-	-	-	-	-	694
	Avg. Salary	30,128	\$30,593	-	-	-	-	-	30,131
<b>25-29</b>	Count	1,578	262	3	-	-	-	-	1,843
	Avg. Salary	38,504	47,441	*	-	-	-	-	39,782
<b>30-34</b>	Count	1,514	851	196	-	-	-	-	2,561
	Avg. Salary	38,130	51,729	\$53,978	-	-	-	-	43,862
<b>35-39</b>	Count	1,349	739	570	97	1	-	-	2,756
	Avg. Salary	35,352	49,891	58,309	\$58,758	*	-	-	44,826
<b>40-44</b>	Count	1,084	727	514	388	66	3	-	2,782
	Avg. Salary	35,333	45,688	56,249	63,576	\$61,972	*	-	46,496
<b>45-49</b>	Count	893	669	537	417	285	68	2	2,871
	Avg. Salary	35,743	44,789	50,535	60,625	70,125	\$65,955	*	48,378
<b>50-54</b>	Count	725	548	573	467	318	241	94	2,966
	Avg. Salary	35,149	41,623	48,183	52,075	59,346	69,104	\$64,638	47,816
<b>55-59</b>	Count	621	498	561	587	445	296	346	3,354
	Avg. Salary	36,030	40,107	43,719	48,066	54,188	60,882	67,292	47,855
<b>60-64</b>	Count	350	351	371	366	332	230	312	2,312
	Avg. Salary	32,076	39,334	46,189	47,239	50,909	56,061	64,942	47,369
<b>65-69</b>	Count	90	90	91	88	76	55	67	557
	Avg. Salary	24,272	38,169	39,974	41,887	47,583	45,703	59,591	41,411
<b>70 &amp; Over</b>	Count	45	29	33	18	13	9	24	171
	Avg. Salary	16,775	29,500	37,004	34,026	28,473	39,720	50,286	31,453
<b>Totals</b>	Count	<b>8,982</b>	<b>4,768</b>	<b>3,449</b>	<b>2,428</b>	<b>1,536</b>	<b>902</b>	<b>845</b>	<b>22,910</b>
	Avg. Salary	<b>\$35,622</b>	<b>\$45,617</b>	<b>\$50,485</b>	<b>\$53,447</b>	<b>\$57,288</b>	<b>\$61,076</b>	<b>\$65,019</b>	<b>\$45,368</b>

Average salary represents annualized salary earned in 2016 and is not shown for cells with counts less than or equal to three participants

**Distribution of Total Active Members by Age and by Years of Service**

Average Age = 46.3      Average Service = 10.0

Age Last Birthday		Whole Years of Service at Valuation Date							Totals
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
<b>Less than 20</b>	Count	60	-	-	-	-	-	-	60
	Avg. Salary	\$20,515	-	-	-	-	-	-	\$20,515
<b>20-24</b>	Count	1,027	6	-	-	-	-	-	1,033
	Avg. Salary	31,059	\$32,678	-	-	-	-	-	31,068
<b>25-29</b>	Count	2,426	381	5	-	-	-	-	2,812
	Avg. Salary	40,272	48,415	\$44,559	-	-	-	-	41,383
<b>30-34</b>	Count	2,290	1,311	291	3	-	-	-	3,895
	Avg. Salary	41,460	53,549	56,030	*	-	-	-	46,623
<b>35-39</b>	Count	1,962	1,213	908	166	1	-	-	4,250
	Avg. Salary	39,681	54,520	60,936	\$62,572	*	-	-	49,352
<b>40-44</b>	Count	1,602	1,104	834	616	108	3	-	4,267
	Avg. Salary	40,036	51,376	59,973	66,129	\$64,219	*	-	51,256
<b>45-49</b>	Count	1,369	1,002	818	693	512	125	5	4,524
	Avg. Salary	39,758	48,958	55,652	64,735	73,272	\$69,935	\$63,237	53,148
<b>50-54</b>	Count	1,173	873	845	679	519	466	183	4,738
	Avg. Salary	39,798	46,723	52,286	55,924	64,990	72,767	67,791	52,696
<b>55-59</b>	Count	1,012	813	842	838	639	509	579	5,232
	Avg. Salary	39,780	45,414	48,880	52,530	59,433	65,568	70,994	52,526
<b>60-64</b>	Count	657	598	591	525	427	346	532	3,676
	Avg. Salary	37,838	45,573	51,040	49,808	54,197	61,118	70,190	51,702
<b>65-69</b>	Count	242	173	185	138	114	89	117	1,058
	Avg. Salary	28,427	43,162	48,406	48,317	53,770	57,481	65,984	46,252
<b>70 &amp; Over</b>	Count	104	62	60	37	26	12	46	347
	Avg. Salary	21,263	33,420	39,787	41,617	41,811	57,223	59,348	36,640
<b>Totals</b>	Count	<b>13,924</b>	<b>7,536</b>	<b>5,379</b>	<b>3,695</b>	<b>2,346</b>	<b>1,550</b>	<b>1,462</b>	<b>35,892</b>
	Avg. Salary	<b>\$39,003</b>	<b>\$49,795</b>	<b>\$54,702</b>	<b>\$57,504</b>	<b>\$62,473</b>	<b>\$66,542</b>	<b>\$69,507</b>	<b>\$49,492</b>

Average salary represents annualized salary earned in 2016 and is not shown for cells with counts less than or equal to three participants

**Distribution of Male Deferred Members by Age and by Years of Service**

Average Age = 51.4      Average Service = 8.8

Age Last Birthday	Whole Years of Service at Valuation Date							Totals
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
Less than 20	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-
25-29	23	13	-	-	-	-	-	36
30-34	39	69	6	-	-	-	-	114
35-39	46	122	20	1	-	-	-	189
40-44	43	102	26	12	1	-	-	197
45-49	51	144	52	18	7	1	-	273
50-54	46	159	85	32	14	4	-	340
55-59	77	190	92	41	29	12	1	442
60-64	42	104	54	25	7	3	-	235
65-69	32	40	11	10	3	-	1	97
70 & Over	14	25	5	3	-	2	-	49
<b>Totals</b>	<b>413</b>	<b>968</b>	<b>364</b>	<b>142</b>	<b>61</b>	<b>22</b>	<b>2</b>	<b>1,972</b>

**Distribution of Female Deferred Members by Age and by Years of Service**

Average Age = 51.7      Average Service = 8.7

Age Last Birthday	Whole Years of Service at Valuation Date							Totals
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
<b>Less than 20</b>	-	-	-	-	-	-	-	-
<b>20-24</b>	1	-	-	-	-	-	-	1
<b>25-29</b>	36	25	-	-	-	-	-	61
<b>30-34</b>	112	173	6	-	-	-	-	291
<b>35-39</b>	112	243	45	-	-	-	-	400
<b>40-44</b>	92	212	62	12	3	-	-	381
<b>45-49</b>	104	296	119	37	9	-	-	565
<b>50-54</b>	114	351	156	71	17	11	2	722
<b>55-59</b>	140	420	231	112	51	20	4	978
<b>60-64</b>	92	283	118	45	22	9	7	576
<b>65-69</b>	52	121	32	16	7	2	2	232
<b>70 &amp; Over</b>	35	59	15	2	-	1	-	112
<b>Totals</b>	<b>890</b>	<b>2,183</b>	<b>784</b>	<b>295</b>	<b>109</b>	<b>43</b>	<b>15</b>	<b>4,319</b>

**Distribution of Total Deferred Members by Age and by Years of Service**

Average Age = 51.6      Average Service = 8.8

Age Last Birthday	Whole Years of Service at Valuation Date							Totals
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
<b>Less than 20</b>	-	-	-	-	-	-	-	-
<b>20-24</b>	1	-	-	-	-	-	-	1
<b>25-29</b>	59	38	-	-	-	-	-	97
<b>30-34</b>	151	242	12	-	-	-	-	405
<b>35-39</b>	158	365	65	1	-	-	-	589
<b>40-44</b>	135	314	88	24	4	-	-	578
<b>45-49</b>	155	440	171	55	16	1	-	838
<b>50-54</b>	160	510	241	103	31	15	2	1,062
<b>55-59</b>	217	610	323	153	80	32	5	1,420
<b>60-64</b>	134	387	172	70	29	12	7	811
<b>65-69</b>	84	161	43	26	10	2	3	329
<b>70 &amp; Over</b>	49	84	20	5	-	3	-	161
<b>Totals</b>	<b>1,303</b>	<b>3,151</b>	<b>1,148</b>	<b>437</b>	<b>170</b>	<b>65</b>	<b>17</b>	<b>6,291</b>

**Schedule of Pension Recipients Added to and Removed from Rolls**

Fiscal Year Ending December 31	Added to Rolls*		Removed from Rolls		Total		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	Count	Annual Pension Benefits	Count	Annual Pension Benefits	Count	Annual Pension Benefits		
2008	1,290	\$26,985,322	552	\$3,650,746	18,333	\$268,901,376	9.50%	\$14,668
2009	1,160	24,062,484	577	6,292,131	18,916	286,671,729	6.61%	15,155
2010	1,388	31,055,004	562	6,314,155	19,742	311,412,579	8.63%	15,774
2011	1,538	34,517,321	592	7,019,999	20,688	338,909,901	8.83%	16,382
2012	1,497	35,646,627	585	6,920,227	21,600	367,636,301	8.48%	17,020
2013	1,745	39,633,549	614	8,227,809	22,731	399,042,042	8.54%	17,555
2014	1,755	42,076,101	726	9,207,206	23,760	431,910,937	8.24%	18,178
2015	1,657	38,445,600	689	9,453,053	24,728	460,903,484	6.71%	18,639
2016	1,768	43,327,957	728	9,191,130	25,768	495,040,311	7.41%	19,211

\* Includes cost-of-living increases

Retired and Disabled Members by Option Code

Option Code*	Count			Monthly Benefit			Count elected self-funded COLA**		
	Male	Female	Total	Male	Female	Total	1%	2%	3%
<b>1</b>	1,994	6,079	8,073	\$3,436,345	\$8,208,831	\$11,645,177	12	6	17
<b>2</b>	4,357	3,100	7,457	8,808,385	4,822,776	13,631,161	11	11	14
<b>2P</b>	1,332	1,800	3,132	2,417,792	3,131,309	5,549,102	4	8	4
<b>3</b>	490	520	1,010	1,125,657	838,939	1,964,596	1	1	-
<b>3P</b>	288	544	832	691,944	1,128,429	1,820,373	2	4	5
<b>4a</b>	313	580	893	490,468	771,455	1,261,923	1	-	3
<b>4b</b>	23	42	65	46,352	63,401	109,752	3	3	2
<b>5</b>	494	1,440	1,934	753,282	1,784,973	2,538,254	5	3	-
<b>Total</b>	<b>9,291</b>	<b>14,105</b>	<b>23,396</b>	<b>\$17,770,224</b>	<b>\$20,750,113</b>	<b>\$38,520,337</b>	<b>39</b>	<b>36</b>	<b>45</b>
<b>Beneficiaries</b>	<b>511</b>	<b>1,861</b>	<b>2,372</b>	<b>\$509,928</b>	<b>\$2,223,093</b>	<b>\$2,733,021</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Grand Total</b>	<b>9,802</b>	<b>15,966</b>	<b>25,768</b>	<b>\$18,280,152</b>	<b>\$22,973,206</b>	<b>\$41,253,358</b>	<b>39</b>	<b>36</b>	<b>45</b>

\*See optional forms of payment in Appendix B

\*\*Option totals in left portion of the table include these counts of members who elected a self-funded COLA option.



**Pensioners by Monthly Benefit and Option Code**

Males Benefit Amount	Option Code*								Total
	1	2	2P	3	3P	4a**	4b	5	
Under \$200	103	152	60	6	5	29	-	108	463
\$200-\$399	199	339	138	17	18	39	4	147	901
\$400-\$599	213	337	129	24	13	42	2	131	891
\$600-\$799	174	300	105	25	14	31	3	97	749
\$800-\$999	165	275	92	20	13	19	1	84	669
\$1,000-\$1,499	243	536	160	78	33	49	2	126	1,227
\$1,500-\$1,999	202	485	117	54	29	32	1	75	995
\$2,000-\$2,499	175	476	145	73	38	20	3	64	994
\$2,500 & over	520	1,457	386	193	125	68	7	157	2,913
<b>Total</b>	<b>1,994</b>	<b>4,357</b>	<b>1,332</b>	<b>490</b>	<b>288</b>	<b>329</b>	<b>23</b>	<b>989</b>	<b>9,802</b>
Females									
Benefit Amount	1	2	2P	3	3P	4a**	4b	5	Total
Under \$200	491	224	84	16	12	65	4	299	1,195
\$200-\$399	838	383	188	50	26	101	6	470	2,062
\$400-\$599	749	318	150	48	36	81	5	439	1,826
\$600-\$799	613	238	134	50	31	58	3	335	1,462
\$800-\$999	469	226	132	32	34	42	4	267	1,206
\$1,000-\$1,499	881	461	251	90	79	83	6	486	2,337
\$1,500-\$1,999	597	294	188	72	67	39	4	339	1,600
\$2,000-\$2,499	431	253	183	55	63	37	-	225	1,247
\$2,500 & over	1,010	703	490	107	196	100	10	415	3,031
<b>Total</b>	<b>6,079</b>	<b>3,100</b>	<b>1,800</b>	<b>520</b>	<b>544</b>	<b>606</b>	<b>42</b>	<b>3,275</b>	<b>15,966</b>
Males & Females									
Benefit Amount	1	2	2P	3	3P	4a**	4b	5	Total
Under \$200	594	376	144	22	17	94	4	407	1,658
\$200-\$399	1,037	722	326	67	44	140	10	617	2,963
\$400-\$599	962	655	279	72	49	123	7	570	2,717
\$600-\$799	787	538	239	75	45	89	6	432	2,211
\$800-\$999	634	501	224	52	47	61	5	351	1,875
\$1,000-\$1,499	1,124	997	411	168	112	132	8	612	3,564
\$1,500-\$1,999	799	779	305	126	96	71	5	414	2,595
\$2,000-\$2,499	606	729	328	128	101	57	3	289	2,241
\$2,500 & over	1,530	2,160	876	300	321	168	17	572	5,944
<b>Total</b>	<b>8,073</b>	<b>7,457</b>	<b>3,132</b>	<b>1,010</b>	<b>832</b>	<b>935</b>	<b>65</b>	<b>4,264</b>	<b>25,768</b>

\*Options include those who elected a self-funded COLA option.

\*\*Option 4a includes 42 beneficiaries who are receiving a certain only benefit.

**Pensioners by Age and Option Code**

Average Age Male = 72.0

Average Age Female = 72.0

Average Age Total = 72.0

Males	Option Code*									
	Age Last Birthday	1	2	2P	3	3P	4a**	4b	5	Total
<b>Under 50</b>	3	1	-	-	-	6	-	7	17	
<b>50-54</b>	12	25	12	1	-	2	-	13	65	
<b>55-59</b>	75	170	61	11	7	17	5	36	382	
<b>60-64</b>	305	677	256	48	42	41	9	128	1,506	
<b>65-69</b>	462	1,112	436	90	90	76	7	188	2,461	
<b>70-74</b>	413	953	324	93	78	70	2	197	2,130	
<b>75-79</b>	334	667	154	86	43	51	-	173	1,508	
<b>80-84</b>	218	426	72	81	19	41	-	105	962	
<b>85 &amp; over</b>	172	326	17	80	9	25	-	142	771	
<b>Total</b>	<b>1,994</b>	<b>4,357</b>	<b>1,332</b>	<b>490</b>	<b>288</b>	<b>329</b>	<b>23</b>	<b>989</b>	<b>9,802</b>	
Females										
Age Last Birthday	1	2	2P	3	3P	4a**	4b	5	Total	
<b>Under 50</b>	2	3	-	-	-	14	-	21	40	
<b>50-54</b>	27	22	10	1	1	1	3	22	87	
<b>55-59</b>	190	163	122	18	39	23	4	81	640	
<b>60-64</b>	892	663	469	106	120	81	17	362	2,710	
<b>65-69</b>	1,454	932	651	137	181	151	16	569	4,091	
<b>70-74</b>	1,214	617	390	98	122	133	1	585	3,160	
<b>75-79</b>	914	337	115	77	57	85	1	574	2,160	
<b>80-84</b>	674	204	35	38	22	69	-	484	1,526	
<b>85 &amp; over</b>	712	159	8	45	2	49	-	577	1,552	
<b>Total</b>	<b>6,079</b>	<b>3,100</b>	<b>1,800</b>	<b>520</b>	<b>544</b>	<b>606</b>	<b>42</b>	<b>3,275</b>	<b>15,966</b>	
Males & Females										
Age Last Birthday	1	2	2P	3	3P	4a**	4b	5	Total	
<b>Under 50</b>	5	4	-	-	-	20	-	28	57	
<b>50-54</b>	39	47	22	2	1	3	3	35	152	
<b>55-59</b>	265	333	183	29	46	40	9	117	1,022	
<b>60-64</b>	1,197	1,340	725	154	162	122	26	490	4,216	
<b>65-69</b>	1,916	2,044	1,087	227	271	227	23	757	6,552	
<b>70-74</b>	1,627	1,570	714	191	200	203	3	782	5,290	
<b>75-79</b>	1,248	1,004	269	163	100	136	1	747	3,668	
<b>80-84</b>	892	630	107	119	41	110	-	589	2,488	
<b>85 &amp; over</b>	884	485	25	125	11	74	-	719	2,323	
<b>Total</b>	<b>8,073</b>	<b>7,457</b>	<b>3,132</b>	<b>1,010</b>	<b>832</b>	<b>935</b>	<b>65</b>	<b>4,264</b>	<b>25,768</b>	

\*Options include those who elected a self-funded COLA option.

\*\*Option 4a includes 42 beneficiaries who are receiving a certain only benefit.

**Pensions Awarded in 2016 by Option Code**

Average Age = 62.7

<b>Males &amp; Females</b>	<b>Option Code*</b>								
<b>Benefit Amount</b>	<b>1</b>	<b>2</b>	<b>2P</b>	<b>3</b>	<b>3P</b>	<b>4a**</b>	<b>4b</b>	<b>5</b>	<b>Total</b>
<b>Under \$200</b>	31	20	7	1	3	2	3	21	88
<b>\$200-\$399</b>	40	40	22	1	3	5	6	40	157
<b>\$400-\$599</b>	65	44	12	2	4	3	2	37	169
<b>\$600-\$799</b>	31	28	17	4	1	1	5	25	112
<b>\$800-\$999</b>	38	35	17	1	2	1	3	21	118
<b>\$1,000-\$1,499</b>	56	66	27	9	7	6	4	43	218
<b>\$1,500-\$1,999</b>	43	47	19	5	4	4	2	34	158
<b>\$2,000-\$2,499</b>	36	46	22	10	6	1	0	21	142
<b>\$2,500 &amp; over</b>	146	229	87	22	23	16	8	75	606
<b>Total</b>	<b>486</b>	<b>555</b>	<b>230</b>	<b>55</b>	<b>53</b>	<b>39</b>	<b>33</b>	<b>317</b>	<b>1,768</b>
<b>Males &amp; Females</b>									
<b>Age Last Birthday</b>	<b>1</b>	<b>2</b>	<b>2P</b>	<b>3</b>	<b>3P</b>	<b>4a**</b>	<b>4b</b>	<b>5</b>	<b>Total</b>
<b>Under 50</b>	3	0	0	0	0	3	0	3	9
<b>50-54</b>	10	20	7	2	0	0	1	6	46
<b>55-59</b>	55	77	41	11	11	6	4	28	233
<b>60-64</b>	225	255	114	23	28	15	14	92	766
<b>65-69</b>	150	166	60	13	13	10	11	49	472
<b>70-74</b>	36	28	6	4	1	3	3	51	132
<b>75-79</b>	6	7	2	1	0	1	0	30	47
<b>80-84</b>	1	2	0	1	0	1	0	32	37
<b>85 &amp; over</b>	0	0	0	0	0	0	0	26	26
<b>Total</b>	<b>486</b>	<b>555</b>	<b>230</b>	<b>55</b>	<b>53</b>	<b>39</b>	<b>33</b>	<b>317</b>	<b>1,768</b>

\*Options include those who elected a self-funded COLA option

\*\*Option 4a includes 5 beneficiaries who are receiving a certain only benefit.

**Retirees and Disabled Members by Service at Retirement and Years Since Retirement**  
(Average Monthly Benefit)

Average Service at Retirement = 19.9      Average Years Since Retirement = 11.4

Service at Retirement		Years Elapsed Since Retirement							Totals
		0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
<b>Less than 5</b>	Count	225	253	183	113	86	103	74	1,037
	Avg. Benefit	\$305	\$247	\$273	\$1,694	\$161	\$154	\$123	\$217
<b>5-9</b>	Count	1,154	822	616	367	344	279	212	3,794
	Avg. Benefit	\$506	\$434	\$371	\$364	\$313	\$326	\$265	\$411
<b>10-14</b>	Count	1,027	701	555	461	391	303	183	3,621
	Avg. Benefit	\$930	\$779	\$655	\$656	\$594	\$586	\$456	\$735
<b>15-19</b>	Count	895	701	558	508	461	204	132	3,459
	Avg. Benefit	\$1,369	\$1,278	\$1,017	\$973	\$927	\$909	\$726	\$1,125
<b>20-24</b>	Count	952	745	597	407	341	177	86	3,305
	Avg. Benefit	\$2,108	\$1,838	\$1,457	\$1,393	\$1,287	\$1,236	\$1,043	\$1,682
<b>25-29</b>	Count	1,058	1,053	656	441	286	124	66	3,684
	Avg. Benefit	\$2,830	\$2,601	\$2,176	\$2,024	\$1,933	\$1,706	\$1,452	\$2,419
<b>30-34</b>	Count	1,113	816	531	332	314	99	27	3,232
	Avg. Benefit	\$3,687	\$3,432	\$2,839	\$2,659	\$2,712	\$2,392	\$1,838	\$3,228
<b>35 &amp; Over</b>	Count	655	288	130	63	96	26	6	1,264
	Avg. Benefit	\$4,588	\$4,232	\$3,430	\$3,208	\$3,293	\$3,064	\$2,065	\$4,178
<b>Totals</b>	Count	<b>7,079</b>	<b>5,379</b>	<b>3,826</b>	<b>2,692</b>	<b>2,319</b>	<b>1,315</b>	<b>786</b>	<b>23,396</b>
	Avg. Benefit	<b>\$2,111</b>	<b>\$1,857</b>	<b>\$1,423</b>	<b>\$1,299</b>	<b>\$1,268</b>	<b>\$925</b>	<b>\$626</b>	<b>\$1,646</b>

**Retirees and Disabled Members by Year of Retirement**

January 1, 2017 Total = 23,396

<b>Year of Retirement</b>	<b>Count</b>	<b>Year of Retirement</b>	<b>Count</b>
<b>Under 1960</b>	-	<b>1988</b>	250
<b>1960</b>	-	<b>1989</b>	236
<b>1961</b>	-	<b>1990</b>	267
<b>1962</b>	-	<b>1991</b>	286
<b>1963</b>	-	<b>1992</b>	391
<b>1964</b>	-	<b>1993</b>	358
<b>1965</b>	-	<b>1994</b>	410
<b>1966</b>	-	<b>1995</b>	689
<b>1967</b>	-	<b>1996</b>	456
<b>1968</b>	-	<b>1997</b>	466
<b>1969</b>	-	<b>1998</b>	483
<b>1970</b>	-	<b>1999</b>	506
<b>1971</b>	2	<b>2000</b>	581
<b>1972</b>	4	<b>2001</b>	653
<b>1973</b>	3	<b>2002</b>	640
<b>1974</b>	10	<b>2003</b>	729
<b>1975</b>	10	<b>2004</b>	845
<b>1976</b>	15	<b>2005</b>	784
<b>1977</b>	27	<b>2006</b>	801
<b>1978</b>	35	<b>2007</b>	918
<b>1979</b>	48	<b>2008</b>	1,052
<b>1980</b>	43	<b>2009</b>	945
<b>1981</b>	59	<b>2010</b>	1,146
<b>1982</b>	59	<b>2011</b>	1,339
<b>1983</b>	73	<b>2012</b>	1,360
<b>1984</b>	97	<b>2013</b>	1,427
<b>1985</b>	126	<b>2014</b>	1,480
<b>1986</b>	162	<b>2015</b>	1,433
<b>1987</b>	273	<b>2016*</b>	1,419

*\*May include retirements as of January 1, 2017*

**Thirty Year Projected Benefit Payments**

<b>Year Ending December 31</b>	<b>Actives</b>	<b>Retirees*</b>	<b>Total</b>
<b>2017</b>	\$ 35,764,294	\$ 500,067,786	\$ 535,832,080
<b>2018</b>	69,709,519	496,406,965	566,116,485
<b>2019</b>	101,809,781	491,856,664	593,666,445
<b>2020</b>	134,985,525	486,957,986	621,943,512
<b>2021</b>	171,078,875	481,638,532	652,717,408
<b>2022</b>	208,109,769	475,536,821	683,646,590
<b>2023</b>	245,784,410	468,690,905	714,475,315
<b>2024</b>	282,645,856	461,275,113	743,920,970
<b>2025</b>	318,681,219	453,130,148	771,811,367
<b>2026</b>	354,439,443	444,586,828	799,026,271
<b>2027</b>	389,720,144	435,245,621	824,965,765
<b>2028</b>	424,390,627	425,347,383	849,738,010
<b>2029</b>	458,573,714	415,068,857	873,642,571
<b>2030</b>	492,354,227	404,217,118	896,571,345
<b>2031</b>	525,891,217	392,785,998	918,677,215
<b>2032</b>	559,104,536	380,368,858	939,473,394
<b>2033</b>	592,102,832	367,336,838	959,439,670
<b>2034</b>	625,189,366	353,890,934	979,080,300
<b>2035</b>	658,346,848	339,788,585	998,135,432
<b>2036</b>	691,184,971	325,006,364	1,016,191,335
<b>2037</b>	723,767,941	309,966,509	1,033,734,450
<b>2038</b>	755,917,140	294,472,950	1,050,390,090
<b>2039</b>	787,879,725	278,674,566	1,066,554,291
<b>2040</b>	819,436,731	262,673,488	1,082,110,219
<b>2041</b>	849,972,592	246,283,684	1,096,256,276
<b>2042</b>	879,447,963	229,820,784	1,109,268,747
<b>2043</b>	906,771,391	213,280,949	1,120,052,340
<b>2044</b>	931,630,121	196,773,720	1,128,403,841
<b>2045</b>	953,795,919	180,495,768	1,134,291,687
<b>2046</b>	972,187,994	164,546,060	1,136,734,054

\* Includes Disabled Members, Beneficiaries, and Deferred Vested Members. Retirement benefit payments for deferred vested members are assumed to commence at age 60 (age 65 for Tier 2).

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## **APPENDIX A**

### SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

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## Summary of Actuarial Assumptions and Methods

The following methods and assumptions were used in preparing the January 1, 2017 actuarial valuation report.

### 1. Valuation Date

The valuation date for any given year is January 1<sup>st</sup>, the first day of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

### 2. Actuarial Cost Method

The actuarial valuation uses the Entry Age Normal (EAN) actuarial cost method, amortized as a level percentage of payroll. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) the rate that will amortize the unfunded actuarial accrued liability (UAAL).

- a. The valuation is prepared on the projected benefit basis, under which the present value, at the investment return rate assumed to be earned in the future (currently 7.75%), of each participant's expected benefit payable at retirement or death is determined, based on his/her age, service, sex and compensation. The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability, or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable for the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Fund on account of the present group of participants and beneficiaries.
- b. The employer contributions required to support the benefits of the Fund are determined using a level funding approach, and consist of a normal cost contribution and a unfunded accrued liability contribution.
- c. The normal cost contribution is determined using the "entry age normal" actuarial cost method. Under this method, a calculation is made to determine the average uniform and constant percentage rate of employer contribution which, if applied to the compensation of each new participant during the entire period of his/her anticipated covered service, would be required to meet the cost of all benefits payable on his/her behalf based on the benefits provisions applicable for the individual member.



- d. The unfunded actuarial accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability and amortizing the result over 30 years from the valuation date.

3. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (less than) expected investment income, with interest, dividends, and other income recognized immediately. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses. An adjustment is made if the actuarial value is not within 20% of the Market Value. For any year following a year in which the 20% of market value adjustment was applied, the actuarial value is determined as if the adjustment was not applied in the previous year.

4. Economic Assumptions

a. Investment return

7.75% per year, compounded annually, composed of an assumed 3.25% inflation rate and a 4.50% net real rate of return. This rate represents the assumed return, net of investment expenses.

b. Salary increase rate

Age	Rate
20	6.00%
25	6.00%
30	5.75%
35	5.75%
40	5.50%
45	5.50%
50	5.50%
55	5.25%
60	4.25%

c. Payroll growth rate

In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 4.25% per year. This increase rate is solely due to the effect of inflation on salaries, with no allowance for future membership growth.

d. Cost-of-Living adjustment

No cost-of-living adjustment is assumed since the policy for providing the benefit requires Board approval to make the recommendation to the Joint Appropriations

Committee and the funded level of the plan shows a cost-of-living requirement would not be permitted.

5. Demographic Assumptions

a. Mortality

Healthy Pre-Retirement Mortality:

RP-2000 Combined Mortality Table, fully generational, projected with Scale BB

Males: Set back 5 years with a multiplier of 104%

Females: Set back 4 years with a multiplier of 90%

Healthy Post-Retirement Mortality:

RP-2000 Combined Mortality Table, fully generational, projected with Scale BB

Males: Set back 1 year with a multiplier of 104%

Females: Set back 0 years with a multiplier of 90%

Disabled Mortality:

RP-2000 Disabled Mortality Table, fully generational, projected with Scale BB

Males: Set forward 5 years with a multiplier of 120%

Females: Set forward 5 years with a multiplier of 120%

Age	Pre-Retirement		Post-Retirement		Disabled	
	Projected to 2017 using Scale BB					
	Male	Female	Male	Female	Male	Female
20	0.03%	0.02%	0.03%	0.02%	2.57%	0.85%
25	0.03%	0.02%	0.04%	0.02%	2.57%	0.85%
30	0.04%	0.02%	0.04%	0.02%	2.57%	0.85%
35	0.04%	0.03%	0.07%	0.04%	2.57%	0.85%
40	0.08%	0.04%	0.10%	0.06%	2.57%	0.85%
45	0.11%	0.07%	0.14%	0.10%	3.30%	1.32%
50	0.15%	0.10%	0.20%	0.14%	4.04%	1.82%
55	0.21%	0.16%	0.32%	0.22%	4.48%	2.21%
60	0.36%	0.25%	0.56%	0.38%	4.90%	2.74%
65	0.62%	0.43%	0.97%	0.71%	5.81%	3.68%
70	1.08%	0.80%	1.59%	1.23%	7.62%	5.10%
75			2.73%	2.06%	10.15%	7.07%
80			4.66%	3.36%	13.14%	9.79%
85			8.03%	5.68%	18.24%	13.93%
90			14.10%	9.82%	28.98%	21.07%
95			23.14%	15.80%	39.29%	27.08%
100			32.63%	20.31%	47.75%	35.17%

b. Disability and Withdrawal

Age	Disability		Withdrawal	
	Male	Female	Ultimate	
			Male	Female
20	0.01%	0.01%	10.00%	11.00%
25	0.01%	0.01%	10.00%	11.00%
30	0.01%	0.01%	4.50%	7.50%
35	0.01%	0.01%	4.00%	5.00%
40	0.01%	0.01%	4.00%	5.00%
45	0.03%	0.03%	3.50%	5.00%
50	0.15%	0.06%	3.00%	4.00%
55	0.30%	0.15%	3.00%	4.00%
60	0.30%	0.30%	3.00%	4.00%

Service	Withdrawal	
	First five years	
	Male	Female
1	22%	26%
2	18%	21%
3	13%	15%
4	11%	15%
5	11%	14%

c. Retirement Rates

Age	Retirement			
	Tier 1		Tier 2	
	Unreduced	Reduced	Unreduced	Reduced
<50	10.0%	1.0%	10.0%	1.0%
50	10.0%	4.5%	10.0%	4.5%
51	10.0%	4.5%	10.0%	4.5%
52	10.0%	4.5%	10.0%	4.5%
53	10.0%	5.0%	10.0%	5.0%
54	10.0%	5.0%	10.0%	5.0%
55	17.0%	5.0%	17.0%	5.0%
56	17.0%	5.0%	17.0%	5.0%
57	15.0%	5.0%	15.0%	5.0%
58	15.0%	5.5%	15.0%	5.5%
59	15.0%	6.0%	15.0%	6.0%
60	13.0%		13.0%	13.0%
61	13.0%		13.0%	13.0%
62	17.5%		17.5%	17.5%
63	17.5%		17.5%	17.5%
64	17.0%		17.0%	17.0%
65	25.0%		25.0%	
66	32.0%		32.0%	
67	20.0%		20.0%	
68	20.0%		20.0%	
69	20.0%		20.0%	
70+	100.0%		100.0%	

6. Other Assumptions

- a. Percent married: 85.00% of employees are assumed to be married. (No beneficiaries other than the spouse assumed.)
- b. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.
- c. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.
- d. Percent electing deferred termination benefit: Vested terminating members are assumed to elect a refund or a deferred benefit. It is assumed that 25% of active members who terminate with a deferred vested benefit will elect to have their contributions refunded.
- e. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available, which for this plan is age 60 (65 for Tier 2).
- f. No benefit data is available for members entitled to deferred benefits. The benefit is estimated using the final average compensation and service provided by WRS.
- g. There will be no recoveries once disabled. We assume all members are totally disabled.
- h. No surviving spouse will remarry.
- i. Administrative expenses: Assumed to be the average of the prior two years, with each year projected at 6.5% to the valuation date.
- j. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported pay represents amount paid to members during the year ended on the valuation date.
- k. Decrement timing: Decrements of all types are assumed to occur mid-year.
- l. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
- m. Decrement relativity: Decrement rates are converted to probabilities in order to account for multiple decrements.

- n. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in the report, and the actual payroll payable at the time contributions are made.
- o. Benefit Service: All members are assumed to accrue one year of service each year. Exact fractional service is used to determine the amount of benefit payable.

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## **APPENDIX B**

### SUMMARY OF PLAN PROVISIONS

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## Summary of Plan Provisions

**Covered Members** Any full-time or regular part-time employee of an employer as defined under W.S. 9-3-402(a)(vii)

**Tier** Members who join the State of Wyoming Retirement System by August 31, 2012 are in Tier 1, while members who join on or after September 1, 2012 are in Tier 2.

**Final Average Salary** For Tier 1 member: employee's average annual salary for the highest paid three continuous years of service.  
For Tier 2 member: employee's average annual salary for the highest paid five continuous years of service.

### Service Retirement

**Eligibility** Tier 1 members may retire upon normal retirement on the date he/she attains age 60 with four or more years of service while Tier 2 members may retire upon normal retirement on the date he/she attains age 65 with four or more years of service. All employees may also retire upon normal retirement on the date that the sum of the member's age and service is at least 85. Tier 1 members are eligible for a reduced benefit at age 50 with four or more years of service and Tier 2 members are eligible for a reduced benefit at age 55 with four or more years of service. All members are eligible for a reduced benefit at any age with 25 or more years of service.

**Monthly Benefit** For Tier 1 member: 2.125% of employee's Final Average Salary for each year of credited service for the first 15 years of service credit plus 2.25% of Final Average Salary for any years of service credit exceeding 15 years.  
For Tier 2 member: 2.000% of employee's Final (5-year) Average Salary for each year of credited service.

This amount is reduced by 5.0% per year that the employee is under age 60 for Tier 1 and under age 65 for Tier 2. However, members retiring with a combined age and service of at least 85 receive an unreduced benefit. Employees hired prior to July 1, 1981 may be entitled to benefits earned under a different formula.

**Vesting** Any employee who has left employment with four or more years of service, and who has not withdrawn accumulated contributions, is eligible to receive the above benefit or can elect to receive a lump-sum refund of employee contributions with interest. An employee who terminates with less than four years of service is only eligible for the lump-sum benefit.

### Disability Benefit

**Eligibility** Ten or more years of service.

**Benefit** Service retirement benefit earned as of the date of disability, payable immediately.

Park Rangers Effective March 5, 2015, for eligible peace officers as defined under W.S. 6-1-104(a)(vi)(P) whose disability is duty-related, the member shall be eligible immediately for a benefit of 62.5% of the member's final salary.

### Pre-retirement Death Benefit

Eligibility No age or service requirements.

Benefit A lump sum equal to two times the employee contributions with interest. If the employee is vested, the beneficiary can elect, in lieu of this lump sum, to receive a monthly annuity equal to the actuarial equivalent of the retirement benefit that would be due the employee.

Park Rangers Effective March 5, 2015, for eligible peace officers as defined under W.S. 6-1-104(a)(vi)(P) whose death is duty-related, the member shall be eligible immediately for a benefit of 62.5% of member's final actual salary, payable to the surviving spouse plus 6% of the member's final actual salary for each unmarried child under age 18. Payment shall not exceed the member's final actual salary.

### Contributions

Employee 8.25% of salary.

Employer 8.37% plus an additional 1.0% for park rangers.

Interest 3.00% annually.

### Cost-of-Living Improvements

W.S. 9-3-454 prohibits benefit changes, including cost-of-living increases, unless the funded ratio stays above 100% plus a margin for adverse experience throughout the life of the benefit change.

### Optional Forms of Payment

All options include the choice to elect a reduced benefit with a self-funded annual COLA of 1%, 2%, or 3% per year. COLAs commence on July 1 following the two-year anniversary of retirement.

Option 1 Monthly benefit for life with a lump-sum death benefit equal to the excess (if any) of the employee contributions with interest over the total benefits received.

Option 2 Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary.

Option 2P Monthly benefit for life. Upon death, 100% of the benefit continues to be paid to the beneficiary. Benefit reverts to Option 1 amount but without the cash refund feature upon beneficiary death.

Option 3 Monthly benefit for life. Upon death, 50% of the benefit continues to be paid to the beneficiary.

Option 3P Monthly benefit for life. Upon death, 50% of the benefit continues to be paid to the beneficiary. Benefit reverts to Option 1 amount but without the cash refund feature upon beneficiary death.

Option 4a Monthly benefit for life with a guarantee of 120 monthly payments

Option 4b Monthly benefit for life with a guarantee of 240 monthly payments

Option 5 The largest possible monthly benefit payable for life with no lump-sum death benefit.