

**STATE OF WYOMING RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION REPORT**  
**FOR THE YEAR BEGINNING JANUARY 1, 2016**

April 28, 2016

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, 2016**

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, 2016. 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, 2016 is 78.21%. In the January 1, 2015 valuation, this funded ratio was 78.96%. On a market value of assets basis, the funded ratio decreased from 79.71% as of January 1, 2015 to 73.77% as of January 1, 2016.

### **Benefit provisions**

The benefit provisions reflected in this valuation are those which were in effect on January 1, 2016, 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. Duty death and disability benefits for park rangers were added last year. Under Enrolled Act No. 55, Senate File No. 0058, eligible peace officers under W.S. 6-1-104(a)(vi)(P) shall be eligible for disability and death benefits under that section if the disabilities or death are duty connected.

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, 2016 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, 2016 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 \$100 million, composed of a \$116 million investment loss, a \$27 million contribution loss, and a \$44 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, 2016.

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**



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Chief Executive Officer



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## **SECTION I**

### **EXECUTIVE SUMMARY**

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Executive Summary

Item	January 1, 2016	January 1, 2015
	No COLA	No COLA
1. Contributions:		
a. Total normal cost	11.83%	11.96%
b. Employee contributions	(8.25%)	(8.25%)
c. Net employer normal cost	3.58%	3.71%
d. Amortization payment	5.48%	5.19%
e. Administrative expenses	0.32%	0.36%
f. Required contribution	9.38%	9.26%
g. Statutory contribution	(8.37%)	(7.62%)
h. Shortfall/(surplus)	1.01%	1.64%
2. Funding Elements:		
a. Market value of assets (MVA)	\$6,427,796,404	\$6,672,165,875
b. Actuarial value of assets (AVA)	\$6,814,919,591	\$6,609,612,342
c. Actuarial accrued liability (AAL)	\$8,713,353,524	\$8,370,666,482
d. Unfunded/(overfunded) actuarial accrued liability (UAAL)	\$1,898,433,933	\$1,761,054,140
3. Contributions and Ratios:		
a. Annual required contribution	\$174,211,753	\$168,411,742
b. Actual contributions	N/A	144,622,373
i. Employer	N/A	142,665,839
ii. Other	N/A	1,956,534
c. Percentage contributed	N/A	85.87%
d. Funded ratio on an actuarial basis (AVA/AAL)	78.21%	78.96%
e. Funded ratio on a market basis (MVA/AAL)	73.77%	79.71%
f. Projected payroll	\$1,858,678,687	\$1,818,197,022

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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 78.21% and the market value funded ratio is 73.77%.
- 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 45 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 39 years to amortize the unfunded actuarial accrued liability. The increase in the funding period from 26 years as of January 1, 2015 to 39 years as of January 1, 2016 is mainly attributable to the loss on assets.

## 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, 2016. 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, 2016. As of January 1, 2016, the employer contribution is within 1.01% of meeting the Actuarially Determined Contribution.

## Financial Data and Experience

As of January 1, 2016, the Fund has a total market value of \$6,428 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 2015.

During 2015, the total investment return on the market value of assets (MVA), as reported by NEPC, was (0.26%), 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 \$6.8 billion. The AVA is 106.02% of the MVA as of December 31, 2015, compared to 99.06% last year. The difference between the AVA and the MVA is the deferred gains and losses. As of January 1, 2015, the total deferred gain was \$63 million. As of January 1, 2016, the total deferred loss was \$387 million.

In addition to the market return, Table 10 also shows the return on the actuarial value of assets for the Fund. For 2015, this return was 5.87%. 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 \$116.5 million.

## Member Data

Member data as of January 1, 2016 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 increased 2.23% last year, compared to an increase of 2.03% from the prior year.

Of the 36,577 active participants, 6,426 are eligible or will become eligible for unreduced retirement and 7,722 are eligible or will become eligible for reduced retirement in 2016.

The average of the final average salaries for participants who retired or became disabled this year is \$52,242.

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 0.11% 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 15.6 years.

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

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### **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)*

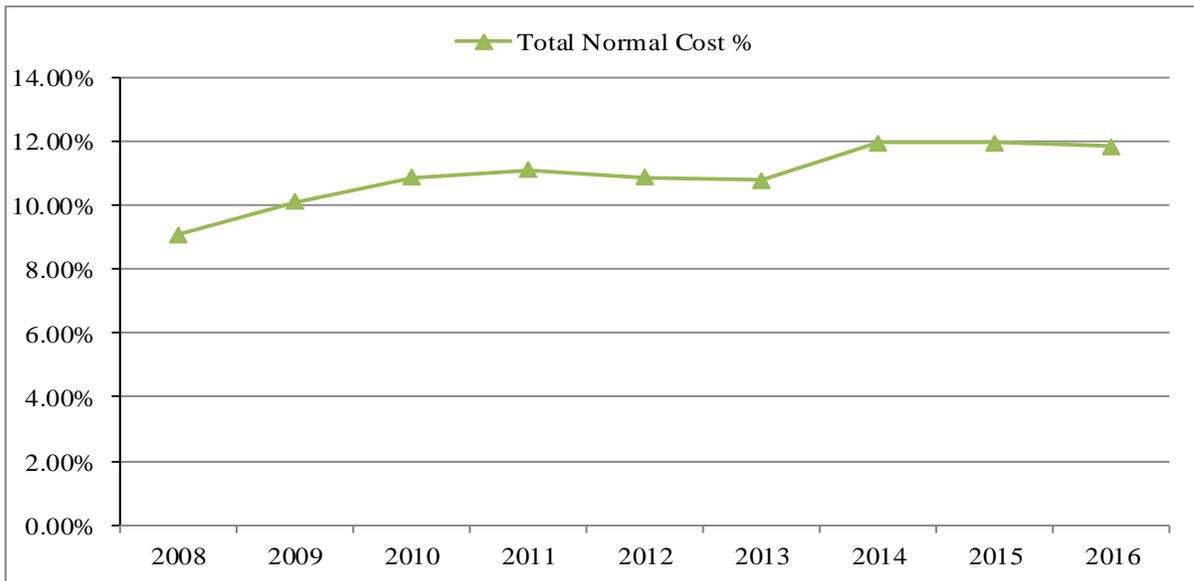
Item	January 1, 2016	January 1, 2015
1. Projected valuation payroll	\$1,858,678,687	\$1,818,197,022
2. Present value of future pay	\$14,398,827,135	\$13,963,776,957
3. Employer normal cost rate	3.58%	3.71%
4. Actuarial accrued liability for active members		
a. Present value of future benefits for active members	\$5,457,234,672	\$5,383,143,968
b. Less: present value of future employer normal costs	(453,353,302)	(461,305,175)
c. Less: present value of future employee contributions	(1,187,903,241)	(1,152,011,609)
d. Actuarial accrued liability	\$3,815,978,129	\$3,769,827,184
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	\$4,508,717,973	\$4,228,660,613
b. Disabled members	33,478,858	33,904,433
c. Inactive members	355,178,564	338,274,252
d. Active members (Item 4d)	3,815,978,129	3,769,827,184
e. Total	\$8,713,353,524	\$8,370,666,482
6. Actuarial value of assets (Table 9)	\$6,814,919,591	\$6,609,612,342
7. Unfunded actuarial accrued liability (UAAL) (Item 5e - Item 6)	\$1,898,433,933	\$1,761,054,140
8. Funding 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	5.48%	5.19%
b. Employer normal cost	3.58%	3.71%
c. Administrative expense	0.32%	0.36%
d. Contribution requirement (a + b + c)	9.38%	9.26%

**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	\$1,293,311,357	\$3,831,921,676	\$5,125,233,033
Death-in-service benefits likely to be paid on behalf of present active members (employer financed portion)	25,236,418	56,784,218	82,020,636
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	322,708,768	(72,727,765)	249,981,003
Benefits likely to be paid to vested inactive members	0	306,717,211	306,717,211
Benefits to be paid to members due refunds	0	48,461,353	48,461,353
Benefits to be paid to current retirees, disabled members, beneficiaries, and future beneficiaries of current retirees	0	4,542,196,831	4,542,196,831
<b>Total</b>	<b>\$1,641,256,543</b>	<b>\$8,713,353,524</b>	<b>\$10,354,610,067</b>
Actuarial value of assets	0	6,814,919,591	6,814,919,591
Liabilities to be covered by future contributions	\$1,641,256,543	\$1,898,433,933	\$3,539,690,476

**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%



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

Item	January 1, 2016
1. Derivation of Experience Gain/(Loss)	
a. Unfunded actuarial accrued liability (UAAL) - previous valuation	\$1,761,054,140
b. Normal cost (NC) for fiscal year ending December 31, 2015	217,488,957
c. Actual administrative expenses for fiscal year ending December 31, 2015	5,410,522
d. Actuarially determined contribution for fiscal year ending December 31, 2015	318,412,996
e. Interest accrual:	
(i) For whole year on (a)	136,481,696
(ii) For half year on (b) + (c) - (d)	(3,701,149)
(iii) Total interest: (e)(i) + (e)(ii)	132,780,547
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)	1,798,321,170
i. Actual UAAL current year	1,898,433,933
j. Experience gain/(loss): (h) - (i)	(100,112,763)
k. Experience gain/(loss) as a % of actuarial accrued liability	-1.15%
2. Approximate portion of gain/(loss) due to investments (at actuarial value)	(\$116,448,757)
3. Approximate portion of gain/(loss) due to contributions higher or lower than expected	(\$27,454,707)
4. Approximate amount of gain/(loss) due to liabilities: (1)(j) - (2) - (3)	\$43,790,701
a. Age & service retirements	(\$10,783,343)
b. Disability retirements	(38,282)
c. Death-in-service	(531,391)
d. Withdrawal from employment	(4,341,003)
e. Rehires	(590,219)
f. Pay increases	63,835,697
g. Death after retirement	3,879,395
h. Other	(7,640,153)
i. Other as a % of actuarial accrued liability	-0.09%

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

Item	January 1, 2016
1. Calculated contribution rate as of January 1, 2015	9.26%
2. Change in contribution rate during year	
a. Change in employer normal cost	-0.13%
b. Assumption changes to accrued liability	0.00%
c. Recognition of prior asset losses (gains)	0.04%
d. Actuarial (gain) loss from current year asset performance	0.33%
e. Actuarial (gain) loss from liability sources & administrative expenses	-0.20%
f. Difference between contributions made and required contribution	0.08%
g. Effect of payroll growing (faster)/slower than assumption	0.11%
h. Open amortization period reset to 30 years	-0.11%
i. Other changes	0.00%
j. Total change	0.12%
3. Calculated contribution rate as of January 1, 2016	9.38%

Statement of Plan Net Assets

Assets at Market Value		
Item	FYE 2015	FYE 2014
1. Cash and Cash Equivalents (Operating Cash)	\$448,938,019	\$399,160,716
2. Receivables		
a. Insurance premium tax	\$0	\$0
b. Buy backs	0	0
c. Employer contributions	10,619,148	10,858,642
d. Employee contributions	10,478,793	11,657,199
e. Securities sold	0	3,317,938
f. Accrued interest and dividends	12,519,746	17,352,715
g. Currency contract receivable	2,902,530,772	982,131,965
h. Other	31,348,026	132,048
i. Rebate and fee income receivable	0	0
j. Total receivables	\$2,967,496,485	\$1,025,450,507
3. Investments, at Fair Value	\$6,304,087,156	\$6,843,661,587
4. Liabilities		
a. Benefits and refunds payable	(\$560,862)	(\$785,069)
b. Securities purchased	(53,039,267)	(60,696,494)
c. Administrative and consulting fees payable	(11,158,993)	(11,173,928)
d. Currency contract payable	(2,896,878,756)	(960,112,844)
e. Securities lending collateral	(331,087,378)	(563,338,600)
f. Total liabilities	(\$3,292,725,256)	(\$1,596,106,935)
5. Total Market Value of Assets Available for Benefits	\$6,427,796,404	\$6,672,165,875

Reconciliation of Plan Net Assets

Assets at Market Value		
Item	FYE 2015	FYE 2014
A. Market Value of Assets at Beginning of Year	\$6,672,165,875	\$6,524,646,566
B. Contribution Income:		
1. Contributions		
a. Employee	\$147,360,099	\$137,144,565
b. Employer	142,665,839	127,929,930
c. Other	8,125,569	5,614,541
d. Total	\$298,151,507	\$270,689,036
2. Investment Income		
a. Interest, dividends, and other income	\$151,712,323	\$162,674,373
b. Net appreciation	(181,911,723)	194,641,648
c. Investment expenses	(38,944,573)	(42,546,926)
d. Net investment income	\$(69,143,973)	\$314,769,095
3. Securities Lending		
a. Gross income	\$2,321,226	\$4,017,871
b. Deductions	(332,895)	(602,014)
c. Net investment income	\$1,988,331	\$3,415,857
4. Benefits and Refunds		
a. Refunds	\$(19,365,045)	\$(17,821,799)
b. Regular monthly benefits	(450,589,769)	(418,274,815)
c. Total	\$(469,954,814)	\$(436,096,614)
5. Administrative and Miscellaneous Expenses	\$(5,410,522)	\$(5,258,065)
C. Market Value of Assets at End of Year	\$6,427,796,404	\$6,672,165,875

Progress of Fund Through December 31, 2015

Plan Year Ending December 31	Employer Contributions*	Employee Contributions*	Administrative Expenses	Net Investment Income**	Benefit Payments	Transfers	Actuarial Value of Assets
Total	\$ 2,175,551,399	\$ 2,004,898,517	\$ (63,522,169)	\$ 7,667,386,097	\$ (5,619,877,715)	\$ (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

\* 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 2015	FYE 2014
1. Actuarial value of assets, beginning of year (without corridor)	\$6,609,612,342	\$6,244,501,550
2. Market value, end of year	\$6,427,796,404	\$6,672,165,875
3. Market value, beginning of year	\$6,672,165,875	\$6,524,646,566
4. Non-investment/administrative net cash flow:		
a. Employee contributions	\$147,360,099	\$137,144,565
b. Employer contributions	142,665,839	127,929,930
c. Other contributions	8,125,569	5,614,541
d. Refund of employee accounts	(19,365,045)	(17,821,799)
e. Retirement benefits	(450,589,769)	(418,274,815)
f. Administrative expenses	(5,410,522)	(5,258,065)
g. Total net cash flow: [sum of (4a) through (4f)]	(\$177,213,829)	(\$170,665,643)
5. Investments and securities lending:		
a. Interest and dividends on investments	\$151,712,323	\$162,674,373
b. Gross income from securities lending	2,321,226	4,017,871
c. Fees and expenses	(39,277,468)	(43,148,940)
d. Total net income: [sum of (5a) through (5c)]	\$114,756,081	\$123,543,304
6. Investment income:		
a. Actual market return: (2) - (3) - (4g) - (5d)	(\$181,911,723)	\$194,641,648
b. Assumed rate of return	7.75%	7.75%
c. Assumed amount of return	395,597,869	375,626,907
d. Amount subject to phase-in: (6a) - (6c)	(\$577,509,592)	(\$180,985,259)
7. Phase-in recognition of investment income:		
a. Current year: 0.20 * (6d)	(\$115,501,918)	(\$36,197,052)
b. First prior year	(36,197,052)	62,899,547
c. Second prior year	62,899,547	60,680,168
d. Third prior year	60,680,168	(99,713,617)
e. Fourth prior year	(99,713,617)	48,937,178
f. Total recognition	(\$127,832,872)	\$36,606,224
<b>8. Actuarial value of assets, end of year</b>		
a. Preliminary actuarial value of assets, end of year: (1) + (4g) + (5d) + (6c) + (7f)	\$6,814,919,591	\$6,609,612,342
b. Upper corridor limit: 120% * (2)	7,713,355,685	8,006,599,050
c. Lower corridor limit: 80% * (2)	5,142,237,123	5,337,732,700
d. Actuarial value of assets, end of year	\$6,814,919,591	\$6,609,612,342
9. Difference between market and actuarial value of assets	(\$387,123,187)	\$62,553,533
<b>10. Actuarial rate of return</b>	5.87%	8.70%
<b>11. Market rate of return*</b>	-0.26%	4.70%
<b>12. Ratio of actuarial value to market value of assets</b>	106.02%	99.06%

\* Current year market rate of return is based on unaudited data and is supplied by NEPC, LLC.

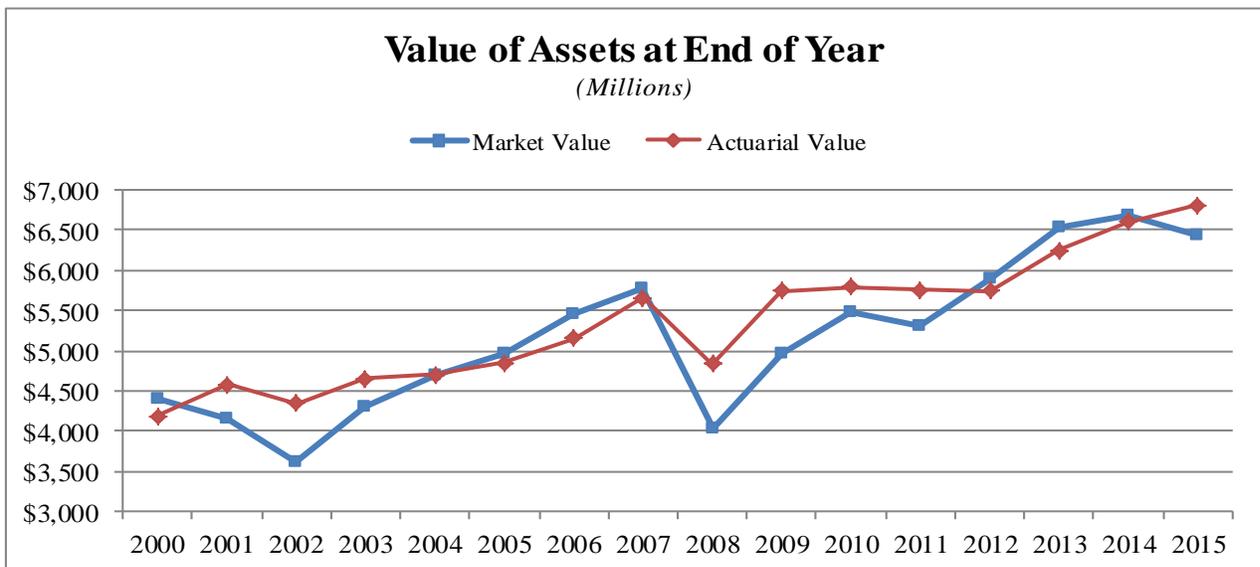
### History of Investment Returns

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%

**Average returns:**

Last five years:	6.03%	5.85%
Last ten years:	4.85%	5.45%

The market rates above were provided by NEPC, LLC. The actuarial rates above are based on the financial information provided by Eide Bailly, LLP.



**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%

*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%

*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	-	-	-

*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	Disableds	Beneficiaries	Participants Due Refunds	Total
	Tier 1	Tier 2						
<b>Number as of January 1, 2015</b>	<b>28,110</b>	<b>8,379</b>	<b>5,905</b>	<b>21,269</b>	<b>248</b>	<b>2,243</b>	<b>20,242</b>	<b>86,396</b>
New participants	-	3,665	-	-	-	-	477	4,142
Vested terminations	(827)	(11)	846	-	-	-	(8)	-
Retirements	(1,169)	-	(294)	1,463	-	-	-	-
Disability	(8)	-	(1)	-	9	-	-	-
Deceased with beneficiary	(10)	-	(7)	(150)	(2)	169	-	-
Deceased without beneficiary	(7)	-	(3)	(384)	(11)	(113)	-	(518)
Due refunds	(257)	(1,239)	(3)	-	-	-	1,499	-
Lump sum payoffs	(324)	(299)	(200)	(8)	-	(19)	(661)	(1,511)
Rehires/return to active	163	408	(169)	(2)	-	-	(353)	47
Certain period expired	-	-	-	-	-	-	-	-
Reclassifications	(41)	41	-	-	-	-	-	-
Data corrections	3	-	22	-	-	16	-	41
<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>

Demographic Statistics

	January 1		Change
	2016	2015	
<u>Active Participants</u>			
Number	36,577	36,489	0.2%
<i>Vested</i>	24,084	24,109	
<i>Not vested</i>	12,493	12,380	
Average age (years)	46.24	46.36	-0.3%
Average service (years)	9.93	9.99	-0.6%
Average entry age (years)	36.31	36.37	-0.2%
Total payroll*	\$1,858,678,687	\$1,818,197,022	2.2%
Average payroll*	\$50,816	\$49,829	2.0%
Total employee contributions with interest	\$1,472,111,790	\$1,394,083,171	5.6%
Average employee contributions with interest	\$40,247	\$38,206	5.3%
<u>Vested Former Participants</u>			
Number	6,096	5,905	3.2%
Average age (years)	51.96	51.94	0.0%
Total employee contributions with interest	\$197,288,124	\$187,435,793	5.3%
Average employee contributions with interest	\$32,364	\$31,742	2.0%
<u>Service Retirees</u>			
Number	22,188	21,269	4.3%
Average age (years)	71.59	71.43	0.2%
Total annual benefits	\$426,230,974	\$398,099,486	7.1%
Average annual benefit	\$19,210	\$18,717	2.6%
<u>Disability Retirees</u>			
Number	244	248	-1.6%
Average age (years)	63.75	63.62	0.2%
Total annual benefits	\$3,808,599	\$3,854,566	-1.2%
Average annual benefit	\$15,609	\$15,543	0.4%
<u>Beneficiaries</u>			
Number	2,296	2,243	2.4%
Average age (years)	75.72	75.08	0.9%
Total annual benefits	\$30,863,911	\$29,956,885	3.0%
Average annual benefit	\$13,442	\$13,356	0.6%
<u>Participants Due Refunds</u>			
Number	21,196	20,242	4.7%
Total Refunds Due	\$48,461,353	\$42,815,005	13.2%

\* Projected payroll for the upcoming valuation year

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

Average Age = 47.0      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	20	-	-	-	-	-	-	20
	Avg. Salary	\$23,211	-	-	-	-	-	-	\$23,211
<b>20-24</b>	Count	348	3	-	-	-	-	-	351
	Avg. Salary	34,100	*	-	-	-	-	-	34,130
<b>25-29</b>	Count	868	109	2	-	-	-	-	979
	Avg. Salary	43,611	\$50,305	*	-	-	-	-	44,360
<b>30-34</b>	Count	796	444	95	4	-	-	-	1,339
	Avg. Salary	47,769	56,702	\$58,900	\$63,557	-	-	-	51,568
<b>35-39</b>	Count	631	487	303	57	-	-	-	1,478
	Avg. Salary	49,161	62,110	64,337	63,413	-	-	-	57,089
<b>40-44</b>	Count	540	371	273	255	49	1	-	1,489
	Avg. Salary	48,625	59,435	65,445	68,945	\$70,001	*	-	58,593
<b>45-49</b>	Count	492	339	263	254	223	69	2	1,642
	Avg. Salary	47,672	60,883	61,543	71,058	76,337	\$71,878	*	61,160
<b>50-54</b>	Count	443	340	281	215	210	224	110	1,823
	Avg. Salary	46,974	54,300	58,300	65,068	71,595	76,285	\$72,478	60,197
<b>55-59</b>	Count	427	330	294	218	206	198	276	1,949
	Avg. Salary	45,300	53,526	56,694	62,469	69,325	70,216	74,372	59,519
<b>60-64</b>	Count	352	272	201	141	113	132	228	1,439
	Avg. Salary	44,992	52,213	58,244	58,399	67,176	73,263	76,436	58,839
<b>65-69</b>	Count	143	90	90	56	40	29	57	505
	Avg. Salary	32,964	50,523	55,468	61,107	66,031	71,089	77,395	53,048
<b>70 &amp; Over</b>	Count	53	37	18	17	11	8	20	164
	Avg. Salary	24,727	37,571	48,587	44,851	40,033	71,778	74,136	41,677
<b>Totals</b>	Count	<b>5,113</b>	<b>2,822</b>	<b>1,820</b>	<b>1,217</b>	<b>852</b>	<b>661</b>	<b>693</b>	<b>13,178</b>
	Avg. Salary	<b>\$45,171</b>	<b>\$56,688</b>	<b>\$60,361</b>	<b>\$65,345</b>	<b>\$70,941</b>	<b>\$73,095</b>	<b>\$74,941</b>	<b>\$56,230</b>

Average salary represents annualized salary earned in 2015 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 = 45.8      Average Service = 9.7

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>	Count	44	-	-	-	-	-	-	44
	Avg. Salary	\$16,471	-	-	-	-	-	-	\$16,471
<b>20-24</b>	Count	729	1	-	-	-	-	-	730
	Avg. Salary	29,978	*	-	-	-	-	-	29,985
<b>25-29</b>	Count	1,717	255	4	-	-	-	-	1,976
	Avg. Salary	38,093	\$45,241	\$30,128	-	-	-	-	39,000
<b>30-34</b>	Count	1,548	854	159	-	-	-	-	2,561
	Avg. Salary	36,495	51,629	53,162	-	-	-	-	42,576
<b>35-39</b>	Count	1,399	742	557	101	-	-	-	2,799
	Avg. Salary	35,262	48,418	57,257	\$58,240	-	-	-	43,956
<b>40-44</b>	Count	1,152	729	493	359	83	3	-	2,819
	Avg. Salary	34,935	45,400	54,945	62,949	\$62,553	*	-	45,539
<b>45-49</b>	Count	919	665	505	375	267	75	2	2,808
	Avg. Salary	34,375	45,086	50,372	59,653	69,359	\$64,664	*	47,313
<b>50-54</b>	Count	791	575	569	490	348	244	125	3,142
	Avg. Salary	35,227	41,487	44,783	50,359	58,410	67,571	\$63,954	46,685
<b>55-59</b>	Count	654	558	576	581	439	335	401	3,544
	Avg. Salary	34,513	40,330	44,513	47,906	53,686	59,375	67,763	47,737
<b>60-64</b>	Count	338	349	332	355	307	226	312	2,219
	Avg. Salary	30,346	40,672	44,968	44,628	52,044	52,549	64,848	46,557
<b>65-69</b>	Count	76	118	102	75	82	60	86	599
	Avg. Salary	23,015	38,629	40,536	41,138	43,401	50,109	59,016	42,017
<b>70 &amp; Over</b>	Count	48	24	31	11	15	8	21	158
	Avg. Salary	16,744	21,322	34,348	38,322	29,227	44,863	46,743	28,992
<b>Totals</b>	Count	<b>9,415</b>	<b>4,870</b>	<b>3,328</b>	<b>2,347</b>	<b>1,541</b>	<b>951</b>	<b>947</b>	<b>23,399</b>
	Avg. Salary	<b>\$34,933</b>	<b>\$45,234</b>	<b>\$49,351</b>	<b>\$52,284</b>	<b>\$56,833</b>	<b>\$59,542</b>	<b>\$65,007</b>	<b>\$44,528</b>

Average salary represents annualized salary earned in 2015 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 = 46.2      Average Service = 9.9

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	64	-	-	-	-	-	-	64
	Avg. Salary	\$18,577	-	-	-	-	-	-	\$18,577
<b>20-24</b>	Count	1,077	4	-	-	-	-	-	1,081
	Avg. Salary	31,310	\$37,122	-	-	-	-	-	31,331
<b>25-29</b>	Count	2,585	364	6	-	-	-	-	2,955
	Avg. Salary	39,946	46,758	\$35,284	-	-	-	-	40,776
<b>30-34</b>	Count	2,344	1,298	254	4	-	-	-	3,900
	Avg. Salary	40,324	53,364	55,308	\$63,557	-	-	-	45,664
<b>35-39</b>	Count	2,030	1,229	860	158	-	-	-	4,277
	Avg. Salary	39,582	53,844	59,751	60,106	-	-	-	48,494
<b>40-44</b>	Count	1,692	1,100	766	614	132	4	-	4,308
	Avg. Salary	39,304	50,133	58,687	65,439	\$65,318	\$53,535	-	50,051
<b>45-49</b>	Count	1,411	1,004	768	629	490	144	4	4,450
	Avg. Salary	39,012	50,420	54,197	64,258	72,534	68,121	\$54,416	52,422
<b>50-54</b>	Count	1,234	915	850	705	558	468	235	4,965
	Avg. Salary	39,444	46,248	49,252	54,844	63,372	71,742	67,944	51,646
<b>55-59</b>	Count	1,081	888	870	799	645	533	677	5,493
	Avg. Salary	38,774	45,234	48,629	51,880	58,681	63,402	70,457	51,918
<b>60-64</b>	Count	690	621	533	496	420	358	540	3,658
	Avg. Salary	37,818	45,727	49,974	48,542	56,115	60,187	69,741	51,389
<b>65-69</b>	Count	219	208	192	131	122	89	143	1,104
	Avg. Salary	29,511	43,775	47,535	49,674	50,821	56,945	66,342	47,063
<b>70 &amp; Over</b>	Count	101	61	49	28	26	16	41	322
	Avg. Salary	20,933	31,178	39,579	42,286	33,799	58,321	60,105	35,452
<b>Totals</b>	Count	<b>14,528</b>	<b>7,692</b>	<b>5,148</b>	<b>3,564</b>	<b>2,393</b>	<b>1,612</b>	<b>1,640</b>	<b>36,577</b>
	Avg. Salary	<b>\$38,536</b>	<b>\$49,436</b>	<b>\$53,244</b>	<b>\$56,744</b>	<b>\$61,856</b>	<b>\$65,099</b>	<b>\$69,205</b>	<b>\$48,744</b>

Average salary represents annualized salary earned in 2015 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 = 51.7      Average Service = 9.0

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	
Less than 20	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-
25-29	16	12	-	-	-	-	-	28
30-34	35	72	4	-	-	-	-	111
35-39	42	100	22	2	-	-	-	166
40-44	42	104	26	5	2	-	-	179
45-49	51	144	52	16	7	1	-	271
50-54	50	164	76	34	19	6	1	350
55-59	63	178	102	51	22	12	1	429
60-64	46	97	55	20	10	3	-	231
65-69	26	36	10	10	5	2	-	89
70 & Over	14	28	6	2	-	1	-	51
<b>Totals</b>	<b>385</b>	<b>935</b>	<b>353</b>	<b>140</b>	<b>65</b>	<b>25</b>	<b>2</b>	<b>1,905</b>

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

Average Age = 52.1      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>	3	-	-	-	-	-	-	3
<b>25-29</b>	39	27	-	-	-	-	-	66
<b>30-34</b>	91	156	3	-	-	-	-	250
<b>35-39</b>	101	207	32	2	-	-	-	342
<b>40-44</b>	73	209	63	11	-	-	-	356
<b>45-49</b>	103	295	102	37	12	1	-	550
<b>50-54</b>	121	366	164	79	12	9	2	753
<b>55-59</b>	135	419	232	96	59	21	2	964
<b>60-64</b>	93	263	116	49	27	7	3	558
<b>65-69</b>	52	119	33	18	6	3	2	233
<b>70 &amp; Over</b>	35	60	16	3	-	2	-	116
<b>Totals</b>	<b>846</b>	<b>2,121</b>	<b>761</b>	<b>295</b>	<b>116</b>	<b>43</b>	<b>9</b>	<b>4,191</b>

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

Average Age = 52.0      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>	3	-	-	-	-	-	-	3
<b>25-29</b>	55	39	-	-	-	-	-	94
<b>30-34</b>	126	228	7	-	-	-	-	361
<b>35-39</b>	143	307	54	4	-	-	-	508
<b>40-44</b>	115	313	89	16	2	-	-	535
<b>45-49</b>	154	439	154	53	19	2	-	821
<b>50-54</b>	171	530	240	113	31	15	3	1,103
<b>55-59</b>	198	597	334	147	81	33	3	1,393
<b>60-64</b>	139	360	171	69	37	10	3	789
<b>65-69</b>	78	155	43	28	11	5	2	322
<b>70 &amp; Over</b>	49	88	22	5	-	3	-	167
<b>Totals</b>	<b>1,231</b>	<b>3,056</b>	<b>1,114</b>	<b>435</b>	<b>181</b>	<b>68</b>	<b>11</b>	<b>6,096</b>

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

<b>Fiscal Year Ending December 31</b>	<b>Added to Rolls*</b>		<b>Removed from Rolls</b>		<b>Total</b>		<b>Percent Increase in Annual Pension Benefits</b>	<b>Average Annual Pension Benefit</b>
	<b>Count</b>	<b>Annual Pension Benefits</b>	<b>Count</b>	<b>Annual Pension Benefits</b>	<b>Count</b>	<b>Annual Pension Benefits</b>		
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

\* 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>	1,902	5,817	7,719	\$3,200,948	\$7,592,817	\$10,793,765	7	2	8
<b>2</b>	4,211	2,890	7,101	8,285,397	4,314,941	12,600,338	6	2	9
<b>2P</b>	1,302	1,736	3,038	2,309,855	2,908,753	5,218,608	2	1	3
<b>3</b>	479	504	983	1,078,577	795,171	1,873,748	-	-	-
<b>3P</b>	279	533	812	673,464	1,080,869	1,754,333	2	3	3
<b>4a</b>	309	568	877	463,880	711,964	1,175,844	-	-	2
<b>4b</b>	13	20	33	32,665	27,772	60,437	1	1	1
<b>5</b>	465	1,404	1,869	673,378	1,686,180	2,359,558	2	1	-
<b>Total</b>	<b>8,960</b>	<b>13,472</b>	<b>22,432</b>	<b>\$16,718,164</b>	<b>\$19,118,467</b>	<b>\$35,836,631</b>	<b>20</b>	<b>10</b>	<b>26</b>
<b>Beneficiaries</b>	<b>476</b>	<b>1,820</b>	<b>2,296</b>	<b>\$467,184</b>	<b>\$2,104,809</b>	<b>\$2,571,993</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Grand Total</b>	<b>9,436</b>	<b>15,292</b>	<b>24,728</b>	<b>\$17,185,348</b>	<b>\$21,223,276</b>	<b>\$38,408,624</b>	<b>20</b>	<b>10</b>	<b>26</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	Option Code*							Total
	1	2	2P	3	3P	4**	5	
<b>Benefit Amount</b>								
<b>Under \$200</b>	104	151	62	5	4	26	114	466
<b>\$200-\$399</b>	195	340	139	17	17	38	142	888
<b>\$400-\$599</b>	202	331	132	25	13	42	124	869
<b>\$600-\$799</b>	174	290	101	25	15	31	93	729
<b>\$800-\$999</b>	160	261	86	22	13	19	81	642
<b>\$1,000-\$1,499</b>	233	530	160	78	31	49	116	1,197
<b>\$1,500-\$1,999</b>	193	488	117	54	27	34	66	979
<b>\$2,000-\$2,499</b>	162	465	142	67	36	22	64	958
<b>\$2,500 &amp; over</b>	479	1,355	363	186	123	66	136	2,708
<b>Total</b>	<b>1,902</b>	<b>4,211</b>	<b>1,302</b>	<b>479</b>	<b>279</b>	<b>327</b>	<b>936</b>	<b>9,436</b>
<b>Females</b>								
<b>Benefit Amount</b>	<b>1</b>	<b>2</b>	<b>2P</b>	<b>3</b>	<b>3P</b>	<b>4**</b>	<b>5</b>	<b>Total</b>
<b>Under \$200</b>	487	220	87	16	10	60	310	1,190
<b>\$200-\$399</b>	832	375	190	51	25	104	468	2,045
<b>\$400-\$599</b>	728	299	151	48	36	83	439	1,784
<b>\$600-\$799</b>	601	236	135	48	35	62	335	1,452
<b>\$800-\$999</b>	435	216	130	31	38	44	262	1,156
<b>\$1,000-\$1,499</b>	851	430	242	88	78	77	489	2,255
<b>\$1,500-\$1,999</b>	581	274	184	69	66	39	324	1,537
<b>\$2,000-\$2,499</b>	407	230	174	54	60	37	215	1,177
<b>\$2,500 &amp; over</b>	895	610	443	99	185	92	372	2,696
<b>Total</b>	<b>5,817</b>	<b>2,890</b>	<b>1,736</b>	<b>504</b>	<b>533</b>	<b>598</b>	<b>3,214</b>	<b>15,292</b>
<b>Males &amp; Females</b>								
<b>Benefit Amount</b>	<b>1</b>	<b>2</b>	<b>2P</b>	<b>3</b>	<b>3P</b>	<b>4**</b>	<b>5</b>	<b>Total</b>
<b>Under \$200</b>	591	371	149	21	14	86	424	1,656
<b>\$200-\$399</b>	1,027	715	329	68	42	142	610	2,933
<b>\$400-\$599</b>	930	630	283	73	49	125	563	2,653
<b>\$600-\$799</b>	775	526	236	73	50	93	428	2,181
<b>\$800-\$999</b>	595	477	216	53	51	63	343	1,798
<b>\$1,000-\$1,499</b>	1,084	960	402	166	109	126	605	3,452
<b>\$1,500-\$1,999</b>	774	762	301	123	93	73	390	2,516
<b>\$2,000-\$2,499</b>	569	695	316	121	96	59	279	2,135
<b>\$2,500 &amp; over</b>	1,374	1,965	806	285	308	158	508	5,404
<b>Total</b>	<b>7,719</b>	<b>7,101</b>	<b>3,038</b>	<b>983</b>	<b>812</b>	<b>925</b>	<b>4,150</b>	<b>24,728</b>

\*Options include those who elected a self-funded COLA option. Option 4 includes options 4a & 4b.

\*\*Includes 15 beneficiaries who are receiving a certain only benefit.

**Pensioners by Age and Option Code**

Average Age Male = 71.9

Average Age Female = 71.9

Average Age Total = 71.9

Males	Option Code*							Total
	1	2	2P	3	3P	4**	5	
Age Last Birthday	1	2	2P	3	3P	4**	5	Total
<b>Under 50</b>	2	2	-	-	-	2	13	19
<b>50-54</b>	15	29	13	1	-	1	13	72
<b>55-59</b>	88	187	61	10	9	15	28	398
<b>60-64</b>	286	658	280	43	47	55	133	1,502
<b>65-69</b>	435	1,070	411	90	83	76	176	2,341
<b>70-74</b>	388	901	311	88	76	71	183	2,018
<b>75-79</b>	307	651	142	96	39	45	158	1,438
<b>80-84</b>	198	394	66	75	18	37	94	882
<b>85 &amp; over</b>	183	319	18	76	7	25	138	766
<b>Total</b>	<b>1,902</b>	<b>4,211</b>	<b>1,302</b>	<b>479</b>	<b>279</b>	<b>327</b>	<b>936</b>	<b>9,436</b>
Females								
Age Last Birthday	1	2	2P	3	3P	4**	5	Total
<b>Under 50</b>	2	3	-	-	-	5	26	36
<b>50-54</b>	30	23	14	-	1	6	29	103
<b>55-59</b>	206	161	128	21	39	23	98	676
<b>60-64</b>	900	667	477	108	127	92	358	2,729
<b>65-69</b>	1,359	844	623	140	169	160	564	3,859
<b>70-74</b>	1,108	533	342	88	123	124	554	2,872
<b>75-79</b>	871	308	102	65	56	79	564	2,045
<b>80-84</b>	651	209	39	46	15	61	462	1,483
<b>85 &amp; over</b>	690	142	11	36	3	48	559	1,489
<b>Total</b>	<b>5,817</b>	<b>2,890</b>	<b>1,736</b>	<b>504</b>	<b>533</b>	<b>598</b>	<b>3,214</b>	<b>15,292</b>
Males & Females								
Age Last Birthday	1	2	2P	3	3P	4**	5	Total
<b>Under 50</b>	4	5	-	-	-	7	39	55
<b>50-54</b>	45	52	27	1	1	7	42	175
<b>55-59</b>	294	348	189	31	48	38	126	1,074
<b>60-64</b>	1,186	1,325	757	151	174	147	491	4,231
<b>65-69</b>	1,794	1,914	1,034	230	252	236	740	6,200
<b>70-74</b>	1,496	1,434	653	176	199	195	737	4,890
<b>75-79</b>	1,178	959	244	161	95	124	722	3,483
<b>80-84</b>	849	603	105	121	33	98	556	2,365
<b>85 &amp; over</b>	873	461	29	112	10	73	697	2,255
<b>Total</b>	<b>7,719</b>	<b>7,101</b>	<b>3,038</b>	<b>983</b>	<b>812</b>	<b>925</b>	<b>4,150</b>	<b>24,728</b>

\*Options include those who elected a self-funded COLA option. Option 4 includes options 4a & 4b.

\*\*Includes 15 beneficiaries who are receiving a certain only benefit.

**Pensions Awarded in 2015 by Option Code**

Average Age = 62.5

<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>4**</b>	<b>5</b>	<b>Total</b>
<b>Under \$200</b>	21	13	3	1	1	2	22	63
<b>\$200-\$399</b>	55	40	16	4	2	6	37	160
<b>\$400-\$599</b>	52	40	13	4	1	4	38	152
<b>\$600-\$799</b>	39	40	13	1	1	3	29	126
<b>\$800-\$999</b>	37	42	16	5	4	2	29	135
<b>\$1,000-\$1,499</b>	55	65	33	4	5	6	39	207
<b>\$1,500-\$1,999</b>	48	34	32	3	7	6	29	159
<b>\$2,000-\$2,499</b>	27	45	23	3	7	2	28	135
<b>\$2,500 &amp; over</b>	144	188	86	16	18	22	46	520
<b>Total</b>	<b>478</b>	<b>507</b>	<b>235</b>	<b>41</b>	<b>46</b>	<b>53</b>	<b>297</b>	<b>1,657</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>4**</b>	<b>5</b>	<b>Total</b>
<b>Under 50</b>	1	0	0	0	0	0	5	6
<b>50-54</b>	16	17	7	0	0	4	8	52
<b>55-59</b>	70	75	40	10	10	8	23	236
<b>60-64</b>	227	224	119	17	20	25	80	712
<b>65-69</b>	134	159	60	11	13	13	58	448
<b>70-74</b>	22	25	8	2	3	1	32	93
<b>75-79</b>	7	5	0	1	0	1	38	52
<b>80-84</b>	1	2	1	0	0	1	28	33
<b>85 &amp; over</b>	0	0	0	0	0	0	25	25
<b>Total</b>	<b>478</b>	<b>507</b>	<b>235</b>	<b>41</b>	<b>46</b>	<b>53</b>	<b>297</b>	<b>1,657</b>

\*Options include those who elected a self-funded COLA option. Option 4 includes options 4a & 4b.

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

Average Service at Retirement = 19.7      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	237	222	187	105	96	108	68	1,023
	Avg. Benefit	\$3,494	\$267	\$508	\$1,452	\$286	\$2,367	\$122	\$225
<b>5-9</b>	Count	1,110	767	594	343	357	300	196	3,667
	Avg. Benefit	\$499	\$416	\$368	\$355	\$310	\$319	\$263	\$401
<b>10-14</b>	Count	972	633	550	461	388	306	173	3,483
	Avg. Benefit	\$904	\$761	\$643	\$652	\$582	\$576	\$457	\$717
<b>15-19</b>	Count	867	690	549	510	427	200	123	3,366
	Avg. Benefit	\$1,366	\$1,215	\$995	\$964	\$920	\$909	\$690	\$1,105
<b>20-24</b>	Count	963	691	584	390	329	162	80	3,199
	Avg. Benefit	\$2,039	\$1,753	\$1,432	\$1,414	\$1,267	\$1,234	\$973	\$1,643
<b>25-29</b>	Count	1,064	976	620	410	264	133	52	3,519
	Avg. Benefit	\$2,798	\$2,536	\$2,125	\$2,000	\$1,941	\$1,644	\$1,366	\$2,385
<b>30-34</b>	Count	1,103	730	512	294	288	102	25	3,054
	Avg. Benefit	\$3,666	\$3,282	\$2,778	\$2,686	\$2,692	\$2,291	\$1,805	\$3,178
<b>35 &amp; Over</b>	Count	574	240	118	59	106	19	5	1,121
	Avg. Benefit	\$4,519	\$4,067	\$3,429	\$3,180	\$3,235	\$2,632	\$1,941	\$4,072
<b>Totals</b>	Count	<b>6,890</b>	<b>4,949</b>	<b>3,714</b>	<b>2,572</b>	<b>2,255</b>	<b>1,330</b>	<b>722</b>	<b>22,432</b>
	Avg. Benefit	<b>\$2,071</b>	<b>\$1,768</b>	<b>\$1,382</b>	<b>\$1,278</b>	<b>\$1,238</b>	<b>\$884</b>	<b>\$592</b>	<b>\$1,598</b>

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

January 1, 2016 Total = 22,432

<b>Year of Retirement</b>	<b>Count</b>	<b>Year of Retirement</b>	<b>Count</b>
<b>Under 1960</b>	-	<b>1988</b>	278
<b>1960</b>	-	<b>1989</b>	250
<b>1961</b>	-	<b>1990</b>	297
<b>1962</b>	-	<b>1991</b>	312
<b>1963</b>	-	<b>1992</b>	412
<b>1964</b>	-	<b>1993</b>	377
<b>1965</b>	-	<b>1994</b>	426
<b>1966</b>	-	<b>1995</b>	721
<b>1967</b>	-	<b>1996</b>	465
<b>1968</b>	-	<b>1997</b>	482
<b>1969</b>	-	<b>1998</b>	498
<b>1970</b>	-	<b>1999</b>	524
<b>1971</b>	5	<b>2000</b>	600
<b>1972</b>	5	<b>2001</b>	667
<b>1973</b>	5	<b>2002</b>	652
<b>1974</b>	13	<b>2003</b>	742
<b>1975</b>	14	<b>2004</b>	854
<b>1976</b>	16	<b>2005</b>	801
<b>1977</b>	31	<b>2006</b>	812
<b>1978</b>	41	<b>2007</b>	924
<b>1979</b>	55	<b>2008</b>	1,068
<b>1980</b>	49	<b>2009</b>	951
<b>1981</b>	69	<b>2010</b>	1,149
<b>1982</b>	68	<b>2011</b>	1,340
<b>1983</b>	82	<b>2012</b>	1,351
<b>1984</b>	113	<b>2013</b>	1,425
<b>1985</b>	147	<b>2014</b>	1,472
<b>1986</b>	180	<b>2015*</b>	1,379
<b>1987</b>	310		

*\*May include retirements as of January 1, 2016*

**Thirty Year Projected Benefit Payments**

<b>Year Ending December 31</b>	<b>Actives</b>	<b>Retirees*</b>	<b>Total</b>
<b>2016</b>	\$ 36,171,440	\$ 465,727,201	\$ 501,898,641
<b>2017</b>	71,247,937	462,145,208	533,393,145
<b>2018</b>	104,313,745	458,122,512	562,436,257
<b>2019</b>	138,479,027	453,450,798	591,929,825
<b>2020</b>	175,917,308	448,399,658	624,316,966
<b>2021</b>	213,801,607	442,881,572	656,683,179
<b>2022</b>	252,220,914	436,626,967	688,847,881
<b>2023</b>	290,440,616	429,702,681	720,143,297
<b>2024</b>	327,597,044	422,268,149	749,865,194
<b>2025</b>	363,826,043	414,163,838	777,989,881
<b>2026</b>	399,638,964	405,713,340	805,352,304
<b>2027</b>	434,779,254	396,450,159	831,229,413
<b>2028</b>	469,182,193	386,637,337	855,819,530
<b>2029</b>	503,042,530	376,559,379	879,601,909
<b>2030</b>	536,348,031	366,075,891	902,423,923
<b>2031</b>	569,271,588	354,913,559	924,185,147
<b>2032</b>	601,761,040	342,837,745	944,598,786
<b>2033</b>	633,894,382	330,298,543	964,192,925
<b>2034</b>	665,962,759	317,241,510	983,204,268
<b>2035</b>	697,913,921	303,708,261	1,001,622,182
<b>2036</b>	729,386,984	289,742,549	1,019,129,533
<b>2037</b>	760,569,975	275,487,553	1,036,057,528
<b>2038</b>	791,074,437	260,830,879	1,051,905,316
<b>2039</b>	821,252,242	245,921,213	1,067,173,455
<b>2040</b>	850,797,279	230,843,885	1,081,641,164
<b>2041</b>	879,406,405	215,554,713	1,094,961,118
<b>2042</b>	906,190,809	200,251,710	1,106,442,519
<b>2043</b>	930,459,407	184,972,369	1,115,431,776
<b>2044</b>	951,868,004	169,851,756	1,121,719,760
<b>2045</b>	970,227,065	155,096,649	1,125,323,714

\* 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, 2016 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 2016 using Scale BB					
	Male	Female	Male	Female	Male	Female
20	0.03%	0.02%	0.03%	0.02%	2.58%	0.85%
25	0.03%	0.02%	0.04%	0.02%	2.58%	0.85%
30	0.04%	0.02%	0.04%	0.02%	2.58%	0.85%
35	0.04%	0.03%	0.07%	0.04%	2.58%	0.85%
40	0.08%	0.04%	0.10%	0.06%	2.58%	0.85%
45	0.11%	0.07%	0.14%	0.10%	3.31%	1.32%
50	0.15%	0.10%	0.20%	0.14%	4.05%	1.83%
55	0.21%	0.16%	0.32%	0.23%	4.51%	2.23%
60	0.36%	0.25%	0.56%	0.39%	4.96%	2.77%
65	0.63%	0.44%	0.98%	0.72%	5.90%	3.72%
70	1.09%	0.81%	1.62%	1.24%	7.73%	5.17%
75			2.77%	2.09%	10.31%	7.15%
80			4.73%	3.40%	13.34%	9.91%
85			8.15%	5.75%	18.44%	14.08%
90			14.27%	9.93%	29.15%	21.20%
95			23.30%	15.90%	39.41%	27.16%
100			32.73%	20.37%	47.75%	35.17%

b. Disability and Withdrawal

Age	Disability		Withdrawal		Withdrawal		
	Male	Female	Ultimate		Service	First five years	
			Male	Female		Male	Female
20	0.01%	0.01%	10.00%	11.00%	1	22%	26%
25	0.01%	0.01%	10.00%	11.00%	2	18%	21%
30	0.01%	0.01%	4.50%	7.50%	3	13%	15%
35	0.01%	0.01%	4.00%	5.00%	4	11%	15%
40	0.01%	0.01%	4.00%	5.00%	5	11%	14%
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%			

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 present value of benefits expected to be paid to vested inactive non-retired members is approximated using the data provided.
- 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 7.62% before July 1, 2015 and 8.37% after, plus, effective March 5, 2015, an additional 1.0% for park rangers.

Interest 3.00% annually effective January 1, 2016

### 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 the July 1<sup>st</sup> 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.