



**Cavanaugh Macdonald**  
CONSULTING, LLC

*The experience and dedication you deserve*

OKLAHOMA PUBLIC EMPLOYEES RETIREMENT SYSTEM

**State of Oklahoma  
Public Employees Retirement System**

**Actuarial Valuation Report  
as of July 1, 2017**





# Cavanaugh Macdonald

CONSULTING, LLC

*The experience and dedication you deserve*

October 10, 2017

Board of Trustees  
Oklahoma Public Employees Retirement System  
5801 N. Broadway Extension, Suite 200  
P.O. Box 53007  
Oklahoma City, OK 73152-3007

Members of the Board:

In this report are submitted the results of the annual valuation of the assets and liabilities of the State of Oklahoma Public Employees Retirement System (OPERS), prepared as of July 1, 2017.

The purpose of this report is to provide a summary of the funded status of the System as of July 1, 2017 and to provide the actuarially determined rate. While not verifying the data at the source, the actuary performed tests for consistency and reasonability.

The promised benefits of the System are included in the actuarially calculated contribution rates which are developed using the Entry Age Normal cost method. A five-year market related value of assets is used for actuarial valuation purposes. Gains and losses are reflected in the unfunded actuarial accrued liability (UAAL) that is being amortized by regular annual contributions as a level percentage of payroll, on the assumption that payroll will increase by 3.50% annually.

An experience study was performed covering the period from July 1, 2013 through June 30, 2016, resulting in several recommendations that were ultimately adopted by the Board of Trustees. The changes to the actuarial assumptions and methods are discussed in detail in the Executive Summary section of this report.

As in the last valuation, liabilities have been calculated without considering future cost of living adjustments (COLAs) in keeping with House Bill 2132 (2011). In addition, House Bill 2630 (2014) closes the plan to most new employees hired after November 1, 2015.

We have prepared the Schedule of Funding Progress and Employer Contribution Trend Information shown in the Comprehensive Annual Financial Report. All historical information that references a valuation date prior to July 1, 2010 was prepared by the previous actuarial firm.

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OPERS Board  
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This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

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

We have also reviewed the supplemental medical benefits provided by the System under Section 401(h) of the Internal Revenue Code and have determined that these benefits are subordinate to the retirement benefits as required.

In our opinion, in order for the System to meet all the benefit obligations of the plan for current active and retired members, contributions equal to at least the actuarially determined rate are necessary for future fiscal years. Assuming these contributions are made to the System, from year to year in the future at the rates recommended on the basis of the successive actuarial valuations, the continued sufficiency of the retirement fund to provide the benefits called for under the System may be safely anticipated. Because the statutory contribution exceeds the actuarially determined rate in this valuation, we recommend the statutory contribution be used to pay the UAAL down faster than under the current schedule and to protect against future investment and experience losses.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Alisa Bennett'.

Alisa Bennett, FSA, EA, FCA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to read 'Brent A. Banister'.

Brent Banister, PhD, FSA, EA, FCA, MAAA  
Chief Pension Actuary



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## EXECUTIVE SUMMARY

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### OVERVIEW

The Oklahoma Public Employees Retirement System (“OPERS” or “System”) provides retirement benefits for most employees of the State of Oklahoma, for most County employees, and for employees of Local Employers who have elected to participate in OPERS.

This report presents the results of the July 1, 2017 actuarial valuation for the System. The primary purposes of performing an actuarial valuation are to:

- Determine the employer contribution rate required to fund the System on an actuarial basis;
- Evaluate the sufficiency of the statutory contribution rate;
- Disclose asset and liability measures as of the valuation date;
- Determine the experience of the System since the last valuation date; and
- Analyze and report on trends in System contributions, assets, and liabilities.

An experience study was performed that analyzed the experience during the period from July 1, 2013 through June 30, 2016. As a result of that study, several changes to the actuarial assumptions and methods were recommended to the Board of Trustees and adopted, effective with the July 1, 2017 actuarial valuation. The assumption changes include:

- (1) decreasing the price inflation from 3.00% to 2.75%,
- (2) decreasing the investment return from 7.25% to 7.00%,
- (3) decreasing the real wage growth from 1.00% to 0.75%,
- (4) changing the mortality assumption to reflect recent mortality improvements,
- (5) adjusting the salary scale to better fit observed experience, and
- (6) adjusting termination, retirement, and disability rates to better fit observed experience.

The revised set of actuarial assumptions increased the actuarial liability at July 1, 2017 by \$249 million, or 2.5% of the actuarial accrued liability, and increased the actuarially determined contribution rate by 1.74% of payroll. Additional details are provided later in this section of the report.

As in prior valuations, liabilities have been calculated without considering future COLAs due to the enactment of House Bill 2132 (2011). Should funding of future COLAs be provided by the System, the COLAs should be included in the actuarial valuation.

There was no legislation since the previous valuation that affects the defined benefit plan. Senate Bill 462 and House Bill 1376 pertain to the newly created defined contribution plan described below.

As described in the previous valuation report, the Plan has been amended by House Bill 2630, enacted in 2014, which states that effective November 1, 2015, OPERS shall create a defined contribution plan for most people first employed by a participating employer. Exemptions from the new defined contribution plan include hazardous duty members and district attorneys, assistant district attorneys and employees of the district attorney’s office. In order to reduce the liabilities of the defined benefit plan, each employer shall send to OPERS the difference between the required employer contribution to OPERS and the amount required to match the participating employee’s contribution in the defined contribution plan, known as Pathfinder.



## EXECUTIVE SUMMARY

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Senate Bill 2120, also enacted in 2014, amends House Bill 2630 to further exempt from the new defined contribution plan county elected officials and employees of a county, county hospital, city or town, conservation district, circuit engineering district, and any public or private trust in which a county, city or town participates. Senate Bill 2120 also states that employees who participate in the defined contribution system are excluded from the \$105 health care subsidy.

New employees specifically exempted from the defined contribution plan will participate in the existing defined benefit plan.

Senate Bill 2120 and House Bill 2630 will, in combination, significantly reduce the number of new members entering the plan after November 1, 2015. While this has had an impact of the valuation results in the last two reports, the impact is still relatively small since it only concerns employees hired between November 1, 2015 and June 30, 2017. However, there are potential ramifications of this legislation that will affect on-going plan funding. In particular, the current amortization of the UAAL is based on the assumption of increasing payroll. The current provision of the new legislation should provide at least as much toward the UAAL as would have been expected otherwise, so we are comfortable with this methodology. We would encourage the Board to study the long-term impact of this legislation.

The valuation results provide a snapshot view of the System's financial condition on July 1, 2017. The unfunded actuarial accrued liability for the System decreased by \$96.6 million due to various factors. A detailed analysis of the change in the unfunded actuarial accrued liability from July 1, 2016 to July 1, 2017 is shown on page 5.

The highlights of the valuation are shown below:

<b>Funded Status \$(millions)</b>	<b>Actuarial Valuation Date</b>	
	<b>July 1, 2017</b>	<b>July 1, 2016</b>
Actuarial Accrued Liability	\$9,782	\$9,428
Actuarial Value of Assets	\$9,241	\$8,791
Unfunded Actuarial Accrued Liability	\$ 540	\$ 637
Funded Ratio (Actuarial Value)	94.5%	93.2%
Market Value of Assets	\$9,229	\$8,436
Funded Ratio (Market Value)	94.4%	89.5%

There was a liability gain of \$134.0 million from demographic experience which resulted in an actuarial accrued liability that was lower than expected (1.35% of expected liability). The components of this net liability gain are identified on page 6.

The estimated net return on the market value of assets was 12.6% for the year ended June 30, 2017. The actuarial value of assets is determined using a method to smooth investment gains and losses in order to develop more stable contribution rates. The return on the actuarial value of assets was approximately 8.2% which resulted in an actuarial gain of \$77.9 million.

Since the previous valuation, the rates of withdrawal, disability, retirement and mortality, as well as the salary scale and the probability of electing a vested benefit have been revised due to the three-year experience study for the period ending June 30, 2016. Also due to this experience study, the investment return assumption has been lowered from 7.25% net of investment expenses, compounded annually to 7.00%, price inflation has been lowered from 3.00% to 2.75% and wage inflation has been lowered from 4.00% to 3.50%. This resulted in an increase to the actuarial accrued liability of \$249 million.



## EXECUTIVE SUMMARY

The actuarial contribution rate for the employers increased from 2016 to 2017:

Contribution Rate	Actuarial Valuation Date	
	July 1, 2017	July 1, 2016
Normal Cost	10.24%	10.01%
Amortization of UAAL*	3.57%	3.79%
Budgeted Expenses	<u>0.40%</u>	<u>0.37%</u>
Actuarially Determined Contribution Rate	14.21%	14.17%
<b>Less</b> Estimated Member Contribution Rate	<u>4.14%</u>	<u>4.10%</u>
Employer Actuarially Determined Contribution Rate	10.07%	10.07%
<b>Less</b> Employer Statutory Contribution Rate	16.50%	16.50%
Contribution Shortfall (Surplus)	(6.43%)	(6.43%)

\*The amortization of UAAL contribution rate recognizes the employer contributions made on behalf of the defined contribution plan participant payroll.

Primarily due to the removal of the COLA assumption and reserve starting with the June 30, 2011 valuation, the employer actuarial contribution rate is less than the employer statutory contribution rate. It is recommended that the employer statutory contribution rate continue unchanged as this will decrease the unfunded actuarial accrued liability and accelerate progress on reaching long-term funding goals.

### EXPERIENCE: July 1, 2016 to July 1, 2017

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is July 1, 2017. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System, which are generally in excess of assets. The actuarial process leads to a method of determining the contributions needed by members and employers in the future to balance the System assets and liabilities.

Changes in the System's assets and liabilities impacted the change in the actuarial contribution rates between July 1, 2016 and July 1, 2017. Each component is examined in the following discussion.

### ASSETS

As of July 1, 2017, the System had total funds of \$9.23 billion when measured on a market value basis. This was an increase of \$794 million from the July 1, 2016 figure of \$8.44 billion. The market value of assets is not used directly in the calculation of the actuarial contribution rate. An asset valuation method, which smoothes the effect of market fluctuations, is used to determine the value of assets used in the valuation, called the "actuarial value of assets." Differences between the actual return on the market value of assets and the assumed return on the actuarial value of assets are phased in over a five-year period. The resulting value must be no less than 80% of the market value and no more than 120% of market value, referred to as "the corridor." See Table 3 for the detailed development of the actuarial value of assets as of July 1, 2017.

The actuarial value of assets as of July 1, 2017 was \$9.24 billion. The annualized dollar-weighted rate of return for fiscal year 2017, measured on the actuarial value of assets, was approximately 8.2%, which resulted in an actuarial gain of \$77.9 million. Measured on the market value of assets, the estimated rate of return was 12.6%, net of investment expenses.



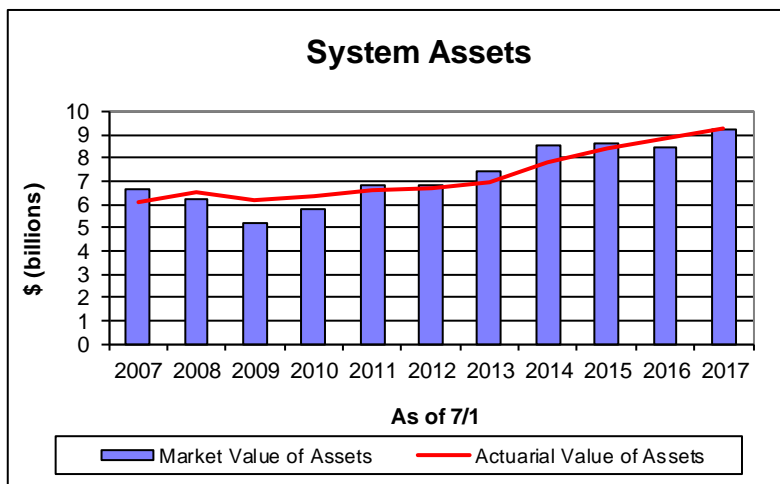


## EXECUTIVE SUMMARY

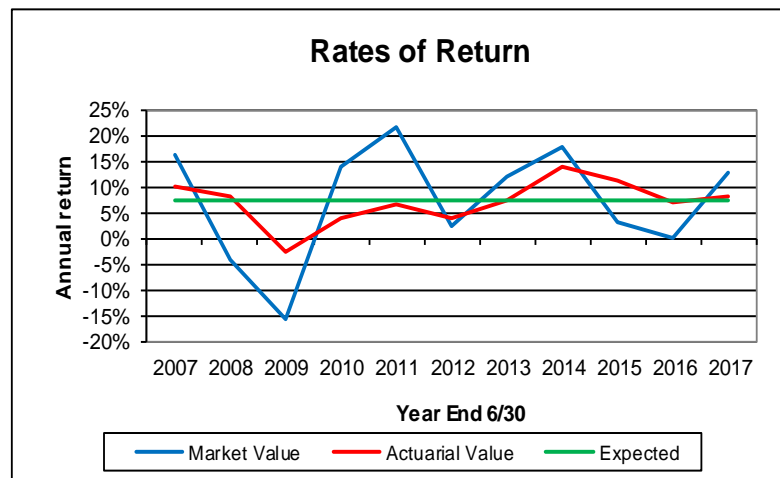
The components of the change in the market and actuarial value of assets for the System are set forth below:

	Market Value \$(millions)	Actuarial Value \$(millions)
Net Assets, July 1, 2016	\$8,435.6	\$8,790.9
• Employer and Member Contributions	358.6	358.6
• Benefit Payments and Expenses	(614.3)	(614.3)
• Investment Income/(Loss)	1,049.6	706.1
Preliminary Value, July 1, 2017	9,229.5	9,241.3
Application of Corridor	N/A	N/A
Final Net Assets, July 1, 2017	\$9,229.5	\$9,241.3
Estimated Rate of Return	12.6%	8.2%

Due to the use of an asset smoothing method, there is approximately \$12 million of deferred investment loss that has not yet been recognized. This deferred investment experience will be reflected in the actuarial value of assets over the next few years.



*There have been years during the last decade in which the actuarial value of assets has been both higher and lower than the market value, which is what would be expected using an asset smoothing method.*



*Rates of return on the market value of assets are very volatile. The more stable return on the actuarial value of assets illustrates the advantage of using an asset smoothing method.*





## EXECUTIVE SUMMARY

### SYSTEM LIABILITIES

The actuarial accrued liability is that portion of the present value of future benefits that will not be paid by future normal costs. The difference between this liability and the asset value at the same date is referred to as the unfunded actuarial accrued liability (UAAL). The UAAL will be reduced if the employers' contributions exceed the employers' normal cost for the year, after allowing for interest earned on the previous years' balance of unfunded actuarial accrued liability. Benefit improvements, experience gains/losses, and changes in the actuarial assumptions and methods will also impact the total actuarial accrued liability and the unfunded portion thereof.

The unfunded actuarial accrued liability as of July 1, 2017 is:

Actuarial Accrued Liability	\$9,781,617,070
Actuarial Value of Assets	<u>9,241,292,469</u>
Unfunded Actuarial Accrued Liability	\$ 540,324,601

See Table 5 for the detailed development of the Actuarial Accrued Liability and Table 7 for the calculation of the Unfunded Actuarial Accrued Liability.

Other factors influencing the UAAL from year to year include actual experience versus that expected based on the actuarial assumptions (for assets and liabilities), changes in the actuarial assumptions, procedures or methods and changes in benefit provisions. Since the previous valuation, the rates of withdrawal, disability, retirement and mortality, as well as the salary scale and the probability of electing a vested benefit have been revised due to the three-year experience study for the period ending June 30, 2016. Also due to this experience study, the investment return assumption has been lowered from 7.25% net of investment expenses, compounded annually to 7.00%, price inflation has been lowered from 3.00% to 2.75% and wage inflation has been lowered from 4.00% to 3.50%. The actual experience measured in this valuation is that which occurred during the plan year ended June 30, 2017. There was an experience gain on both the actuarial value of assets and the liabilities. The net result was a decrease in the UAAL.

Between July 1, 2016 and July 1, 2017 the change in the unfunded actuarial accrued liability for the System was as follows (in millions):

	<u><b>\$(millions)</b></u>
Unfunded Actuarial Accrued Liability, July 1, 2016	\$637
• effect of contributions more than actuarial rate	(108)
• expected decrease due to amortization	(26)
• investment experience	(78)
• liability experience <sup>1</sup>	(134)
• other experience	0
• change in actuarial assumptions	249
• change due to amendments	<u>0</u>
Unfunded Actuarial Accrued Liability, July 1, 2017	\$ 540

<sup>1</sup> Liability gain is about 1.35% of total expected actuarial accrued liability



## EXECUTIVE SUMMARY

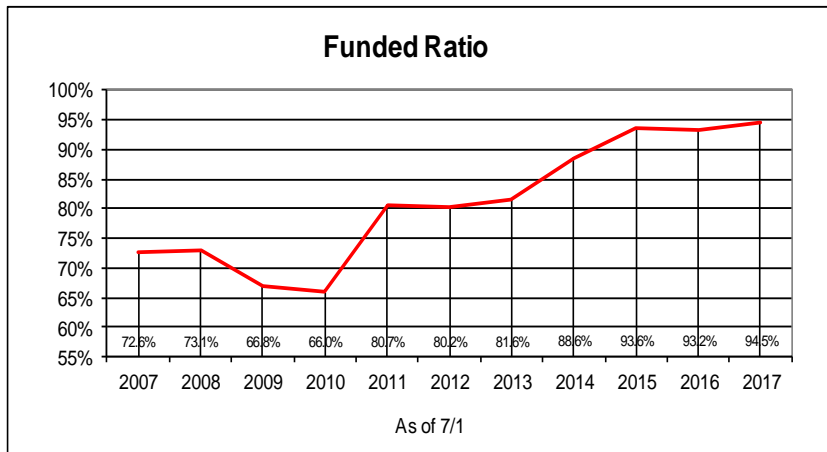
The liability gain for the System can be allocated to actual experience related to each actuarial assumption as follows:

Liability Source	Impact of AAL \$(millions)	% of Expected Liability
Salary Increases	(\$106.2)	(1.07)%
Mortality	(13.1)	(0.13)%
Termination of Employment	(10.5)	(0.11)%
Retirements	(2.6)	(0.03)%
Disability	1.9	0.02%
New Entrants and Rehires	15.9	0.16%
Miscellaneous/Data Changes	(19.4)	(0.19)%
Total (Gain)/Loss	(\$134.0)	(1.35)%

A detailed summary of the change in the UAAL is shown in Table 9.

An evaluation of the unfunded actuarial accrued liability on a pure dollar basis may not provide a complete analysis because only the difference between the assets and liabilities (which are both very large numbers) is reflected. Another way to evaluate the unfunded actuarial accrued liability and the progress made in its funding is to track the funded status, which is the ratio of the actuarial value of assets to the actuarial accrued liability. The funded status information, on both an actuarial and market value basis, is shown below in \$(millions). These ratios do not indicate whether or not the plan could settle its liabilities with available assets, nor are they sufficient, on their own, to indicate the future funding needs of the System.

	7/1/12	7/1/13	7/1/14	7/1/15	7/1/16	7/1/17
<b>Using Actuarial Value of Assets:</b>						
Funded Ratio	80.2%	81.6%	88.6%	93.6%	93.2%	94.5%
Unfunded Actuarial Accrued Liability (UAAL)	\$1,652	\$1,577	\$ 994	\$ 576	\$ 637	\$ 540
<b>Using Market Value of Assets:</b>						
Funded Ratio	81.8%	87.0%	97.9%	96.0%	89.5%	94.4%
Unfunded Actuarial Accrued Liability (UAAL)	\$1,513	\$1,114	\$ 184	\$ 360	\$ 992	\$ 552



*Through the first part of this period, the funded ratio was low and declining. Numerous factors contributed to the decline, including changes in the benefit provisions, contributions less than the actuarial rate, demographic experience and investment experience less favorable than expected based on the assumptions.*

*The increase in 2011 was primarily due to the elimination of the COLA assumption and reserve as a result of legislation in HB 2132 (2011).*



## EXECUTIVE SUMMARY

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### CONTRIBUTION RATES

The funding objective of the System is to pay the normal cost rate plus an amount that will pay off the unfunded actuarial accrued liability over a closed 20-year period commencing July 1, 2007.

Under the Entry Age Normal cost method, the actuarial contribution rate consists of:

- A “normal cost” for the portion of projected liabilities allocated by the actuarial cost method to service of members during the year following the valuation date;
- An “unfunded actuarial accrued liability contribution” for the excess of the portion of projected liabilities allocated to service to date over the actuarial value of assets.

Contributions to the System are made by the members and their employers. Most State employees pay 3.5% of compensation. Local government employees contribute from 3.5% to 8.5% of compensation, depending on the rate chosen by their employer. Starting in 2004, most participants were eligible to make an election to contribute an additional 2.91% of pay and to increase their benefit accrual multiplier for future years of service to 2.5%. Hazardous Duty employees and most elected officials have a different required contribution rate (see Summary of Provisions section of this report).

Effective July 1, 1999, the State’s contribution rate was reduced from 12.5% to 10.0% of payroll and stayed at that level until 2005. For the same period, the combined employer and employee contribution rates for the county and local employees were 13.5% of payroll. As of July 1, 2005, the State’s contribution rate increased to 11.5% of payroll with additional increases of 1.0% each July until reaching 16.5%. The 1.0% increase that was supposed to be effective July 1, 2010 was delayed one year by the 2010 Legislature and was effective July 1, 2011. For county and local employees, the combined contribution rate increased to 15.0% on July 1, 2005 and increased an additional 1.0% of payroll each year beginning July 1, 2006 until it reached 20.0% on July 1, 2010.

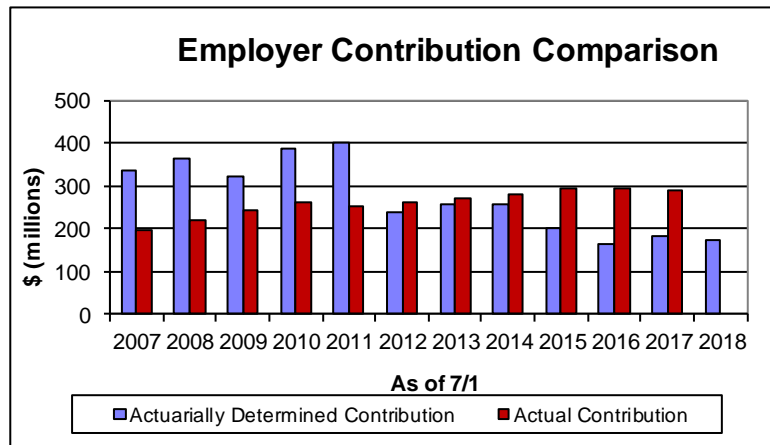
As described in the previous valuation report, the Plan has been amended by House Bill 2630, enacted in 2014, which states that effective November 1, 2015, OPERS shall create a defined contribution plan for most people first employed by a participating employer. In order to reduce the liabilities of the defined benefit plan, each employer shall send to OPERS the difference between the required employer contribution to OPERS and the amount required to match the participating employee’s contribution in the defined contribution plan. The amortization of UAAL contribution rate in this valuation recognizes the employer contributions made on behalf of the defined contribution plan participant payroll.

The ultimate contribution rate of 16.5% for the State is greater than the employer actuarial contribution rate for fiscal year 2017 developed in this valuation. When contributions to the System are greater than the actuarial rate, the UAAL is expected to decrease and be paid down faster. As of the July 1, 2017 valuation, if the System receives the statutory rate and the expected employer contributions on behalf of the defined contribution member payroll and all assumptions are met, it is projected the UAAL will be paid off within the next five years, even though 10 years remain in the amortization period.

The following graph shows the total actuarially determined employer contribution compared to the amount actually received in each year. The funding policy contribution equals the System’s normal cost, budgeted expenses, and an amortization of the unfunded actuarial accrued liability. For July 1, 1998 and prior years, the unfunded actuarial accrued liability was amortized over 25 years from July 1, 1987. For the July 1, 1999 valuation, the amortization period was changed to 40 years from July 1, 1987. For the July 1, 2008 valuation, the amortization period was changed to 20 years from July 1, 2007 (no change in the number of years remaining). As of July 1, 2017, 10 years remain in the amortization period.



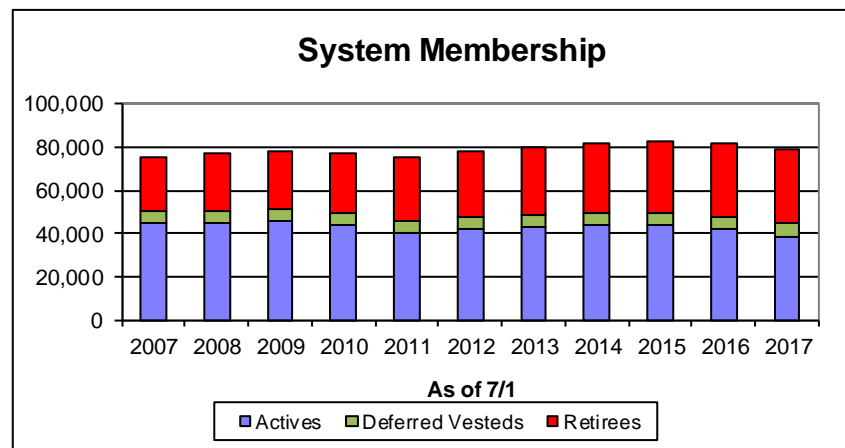
## EXECUTIVE SUMMARY



## MEMBER INFORMATION

The number of active members included in the valuation decreased by 4.6% from the 2015 to the 2016 valuation and then decreased by 7.0% from the 2016 to the 2017 valuation.

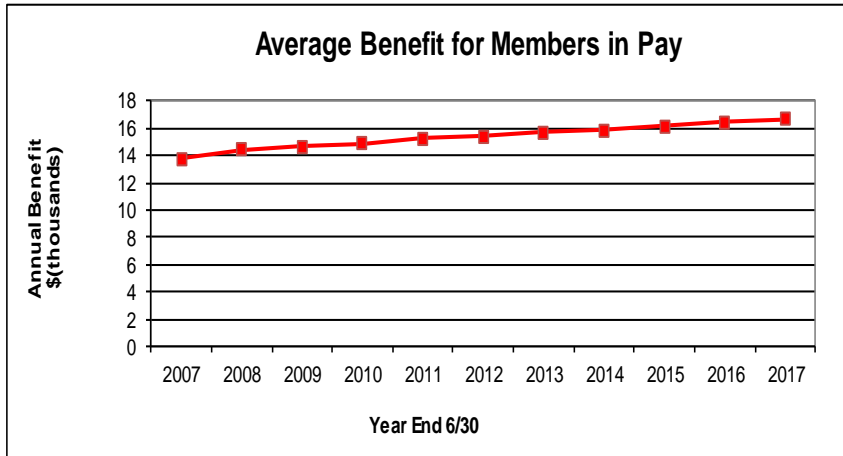
Retired member counts and average retirement benefit amounts continue to increase steadily. There were 34,579 retirees and beneficiaries in the 2017 valuation, with an average benefit of \$1,389 per month. This represents a 1.6% increase in the average monthly benefit from the previous year.



*The number of active members has been fairly stable for most of the period, but is expected to decline in the future due to the defined benefit plan being closed to most new entrants. The number of terminated vested and retirees has increased which is to be expected in an ongoing retirement system.*



## EXECUTIVE SUMMARY



*The average benefit for retirees has climbed steadily over the past 10 years as new retirees leave with higher salaries and therefore, higher benefits than those already retired. In addition, most of the members who die are older with smaller benefits.*

## COMMENTS

As the graph on page 4 shows, investment experience continues to be extremely volatile which creates significant challenges when funding retirement systems. The rate of return on the market value of assets for FY 2017 was about 12.6%, resulting in significantly reducing the net deferred loss. The asset smoothing mechanism will recognize the deferred \$12 million loss in future years. There was also an experience gain of \$134.0 million on liabilities, largely due to salary experience resulting from pay that was lower than expected.

The employer contribution rate increased according to a statutory schedule to an ultimate rate of 16.50% which was reached July 1, 2011. It must be noted that the portion of the actuarial contribution rate to be used to amortize the unfunded actuarial accrued liability was calculated as a level percentage of payroll assuming payroll grows by 3.50% per year, even though House Bill 2630 closes the plan effective November 1, 2015 to all but specifically exempted new employees. This is because House Bill 2630 requires each employer to send to OPERS the difference between the required employer contribution to OPERS and the amount required to match the participating employee's contribution in the defined contribution plan. It is important to note that this continued contribution stream payable on new employee payroll is incorporated into the actuarially determined rate calculated in this valuation, and any changes to reduce the funds received under this provision would negatively impact the actuarially determined rate either now or in the future.

As noted earlier in the report, mainly due to the removal of the COLA assumption and reserve starting in July 1, 2011, the actuarial contribution rate of 10.07% is less than what is currently being funded. Absent any future investment or experience losses, this will serve to decrease the UAAL and cause it to be paid down faster. As of the July 1, 2017 valuation, if the System pays the statutory rate and the plan continues to receive employer contributions on behalf of the defined contribution member payroll, it is projected that the UAAL will be paid off within the next five years. Paying the statutory rate also helps to protect against future investment and experience losses that may be more frequent and/or severe in this time of economic uncertainty.

Also, as noted earlier in the report, should funding of future COLAs be provided by the System, the COLAs should be included in the actuarial valuation.



## EXECUTIVE SUMMARY

For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below.

### COMPARISON OF PRINCIPAL VALUATION RESULTS

	7/1/2017 Valuation	7/1/2016 Valuation	% Change
<b>1. PARTICIPANT DATA</b>			
Number of:			
Active Members	38,873	41,806	(7.0)
Retired and Disabled Members and Beneficiaries	34,579	33,749	2.5
Inactive Members	<u>5,951</u>	<u>5,946</u>	0.1
Total Members	79,403	81,501	(2.6)
Projected Annual Salaries of Active Members	\$ 1,688,543,856	\$ 1,790,809,603	(5.7)
Annual Retirement Payments for Retired Members and Beneficiaries	\$ 576,548,059	\$ 553,631,087	4.1
<b>2. ASSETS AND LIABILITIES</b>			
Total Actuarial Accrued Liability	\$ 9,781,617,070	\$ 9,427,809,623	3.8
Market Value of Assets	\$ 9,229,499,873	\$ 8,435,578,907	9.4
Actuarial Value of Assets	\$ 9,241,292,469	\$ 8,790,886,036	5.1
Unfunded Actuarial Accrued Liability	\$ 540,324,601	\$ 636,923,587	(15.2)
Funded Ratio	94.5%	93.2%	1.3
<b>3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL</b>			
Normal Cost Rate	10.24%	10.01%	
Amortization of Unfunded Actuarial Accrued Liability	3.57%	3.79%	
Budgeted Expenses	<u>0.40%</u>	<u>0.37%</u>	
Total Actuarially Determined Contribution Rate	14.21%	14.17%	
Less Estimated Member Contribution Rate	<u>4.14%</u>	<u>4.10%</u>	
Employer Actuarially Determined Contribution Rate	10.07%	10.07%	
Less Statutory State Employer Contribution Rate	<u>16.50%</u>	<u>16.50%</u>	
Contribution Shortfall/(Surplus)	(6.43%)	(6.43%)	



## SECTION 2 - ASSETS

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### Oklahoma Public Employees Retirement System

#### Market Value of Assets

The current market value represents the "snapshot" or "cash-out" value of System assets as of the valuation date. In addition, market values of assets provide the basis for measuring investment performance. As of July 1, 2017, the market value of assets for the System was \$9.2 billion. Table 1 is a comparison, at market values, of System assets as of June 30, 2017, and June 30, 2016, in total and by investment category. Table 2 summarizes the change in the market value of assets from July 1, 2016 to June 30, 2017.

#### Actuarial Value of Assets

Neither the market value of assets, representing a "cash-out" value of System assets, nor the book value of assets, representing the cost of investments, may be the best measure of the System's ongoing ability to meet its obligations.

To arrive at a suitable value for the actuarial valuation, a technique for determining the actuarial value of assets is used, which dampens swings in the market value while still indirectly recognizing market values.

The actuarial value of assets is based on a five-year moving average of expected and actual market values determined as follows:

- at the beginning of each fiscal year, a preliminary expected actuarial asset value is calculated as the sum of the previous year's actuarial value increased with a year's interest at the System valuation rate plus net cash flow adjusted for interest (at the same rate) to the end of the previous fiscal year;
- the expected actuarial asset value is set equal to the preliminary expected actuarial value plus the unrecognized investment gains and losses as of the beginning of the previous fiscal year;
- the difference between the expected actuarial asset value and the market value is the investment gain or loss for the previous fiscal year;
- the (final) actuarial asset value is the preliminary value plus 20% of the investment gains and losses for each of the five previous fiscal years, but in no case more than 120% of the market value or less than 80% of the market value.

Table 3 shows the development of the actuarial value of assets (AVA) as of the valuation date.





## SECTION 2 - ASSETS

### Oklahoma Public Employees Retirement System

**Table 1**

#### Analysis of Net Assets at Market Value

	June 30, 2017		June 30, 2016	
	Amount \$(millions)	% of Total	Amount \$(millions)	% of Total
Cash & Equivalents	\$ 119.2	1.3%	\$ 120.7	1.4%
Short-term Investments	126.6	1.3%	32.1	0.4%
Government Obligations	2,133.7	22.5%	1,932.2	22.5%
Corporate Bonds	836.1	8.8%	858.7	10.0%
Domestic Equity	3,713.2	39.2%	3,767.2	44.0%
International Equity	2,539.5	26.8%	1,846.8	21.5%
Real Estate	12.1	0.1%	12.9	0.2%
Subtotal	\$ 9,480.4	100.0%	\$ 8,570.6	100.0%
Property (net)	0.4		0.5	
Other Assets	0.3		0.3	
Net Receivables/(Payables)	(251.6)		(135.8)	
Net Assets	\$ 9,229.5		\$ 8,435.6	



## SECTION 2 - ASSETS

### Oklahoma Public Employees Retirement System

**Table 2**

#### Statement of Changes in Net Assets

	Fiscal Year Ended June 30	
	2017	2016*
1. Market Value of Net Assets at Beginning of Year	\$ 8,435,578,907	\$ 8,636,441,984
2. Contributions		
a. Members	\$ 70,276,234	\$ 73,800,890
b. State and local agencies	288,338,941	296,249,191
c. Total contributions (2a) + (2b)	\$ 358,615,175	\$ 370,050,081
3. Net Investment Income		
a. Net appreciation (depreciation) in fair value of investments	\$ 925,746,414	\$ (106,650,476)
b. Interest	68,682,329	69,420,254
c. Dividends	63,072,369	58,215,187
d. Securities lending activities	2,393,028	2,098,331
e. Real estate	363,287	532,069
f. Total investment income/(loss)	\$ 1,060,257,427	\$ 23,615,365
(3a) + (3b) + (3c) + (3d) + (3e)		
g. Investment expenses	(10,642,919)	(8,040,363)
h. Net investment income/(loss) (3f) + (3g)	\$ 1,049,614,508	\$ 15,575,002
i. Total additions/(subtractions) (2c) + (3h)	\$ 1,408,229,683	\$ 385,625,083
4. Deductions		
a. Retirement, death, and survivor benefits	\$ 592,961,277	\$ 565,412,267
b. Refunds and withdrawals	15,950,303	15,862,423
c. Administrative expenses	5,397,137	5,213,470
d. Total deductions (4a) + (4b) + (4c)	\$ 614,308,717	\$ 586,488,160
5. Net Change in Assets (3i) - (4d)	\$ 793,920,966	\$ (200,863,077)
6. Market Value of Net Assets at End of Year*	\$ 9,229,499,873	\$ 8,435,578,907
(1) + (5)		

*\*Several numbers have been adjusted by small amounts since the previous valuation to match the June 30, 2017 statements of changes in plan net position.*



## SECTION 2 - ASSETS

### Oklahoma Public Employees Retirement System

**Table 3**

#### Determination of Actuarial Value of Assets

1. Market Value as of July 1, 2016	\$	8,435,578,907
2. Contributions		
a. Member	\$	70,276,234
b. Employer		288,338,941
c. Total (a) + (b)	\$	<u>358,615,175</u>
3. Decreases During Year		
a. Benefit payments	\$	(592,961,277)
b. Refunds and withdrawals		(15,950,303)
c. Administrative expenses		(5,397,137)
d. Total (a) + (b) + (c)	\$	<u>(614,308,717)</u>
4. Expected Return on Assets at 7.25%	\$	602,472,751
5. Expected Market Value as of June 30, 2017 (1) + (2c) + (3d) + (4)	\$	8,782,358,116
6. Actual Market Value as of June 30, 2017	\$	9,229,499,873
7. Year End 2017 Asset Gain/(Loss) (6) - (5)	\$	447,141,757

#### Schedule of Asset Gains/(Losses)

Year End	Original Amount	Recognized in Prior Years	Recognized in This Year	Recognized in Future Years
2013	\$ 299,344,147	\$ 239,475,317	\$ 59,868,830	\$ 0
2014	766,830,212	460,098,126	153,366,042	153,366,044
2015	(371,179,751)	(148,471,900)	(74,235,950)	(148,471,901)
2016	(624,000,243)	(124,800,049)	(124,800,049)	(374,400,145)
2017	447,141,757	0	89,428,351	357,713,406
Total	\$ 518,136,122	\$ 426,301,494	\$ 103,627,224	\$ (11,792,596)
8. Asset Gain/(Loss) to be Recognized in the Future				\$ (11,792,596)
9. Initial Actuarial Value as of June 30, 2017 (6) - (8)				\$ 9,241,292,469
10. Constraining Values:				
a. 80% of market value (6) x 0.8				\$ 7,383,599,898
b. 120% of market value (6) x 1.2				\$ 11,075,399,848
11. Actuarial Value as of June 30, 2017 (9), but not less than (10a), nor greater than (10b)				\$ 9,241,292,469



## SECTION 3 - SYSTEM LIABILITIES

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### Oklahoma Public Employees Retirement System

In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of assets of the System as of the July 1, 2016 valuation date. In this section, the discussion will focus on the commitments of the System, which are referred to as its liabilities.

Table 4 contains an analysis of the actuarial present value of all future benefits (PVFB) for contributing members, inactive members, retirees and their beneficiaries. The analysis is provided for each group.

The liabilities summarized in Table 4 include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes measures of both benefits already earned and future benefits expected to be earned. For all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and, if an optional benefit is chosen, for the lives of the surviving beneficiaries.

The actuarial assumptions used to determine liabilities are based on the results of an experience study covering the three-year period ended June 30, 2016. This set of assumptions is shown in Appendix B. The liabilities reflect the benefit structure in place as of July 1, 2017.

#### Actuarial Liabilities

A fundamental principle in financing the liabilities of a retirement program is that the cost of its benefits should be related to the period in which benefits are earned, rather than to the period of benefit distribution. An actuarial cost method is a mathematical technique that allocates the present value of future benefits into annual costs. In order to do this allocation, it is necessary for the funding method to “break down” the present value of future benefits into two components:

- (1) that which is attributable to the past; and
- (2) that which is attributable to the future.

Actuarial terminology calls the part attributable to the past the “past service liability” or the “actuarial accrued liability.” The portion allocated to the future is known as the “present value of future normal costs,” with the specific piece of it allocated to the current year being called the “normal cost.” Table 5 contains the calculation of actuarial liabilities for all groups.

In valuations prior to July 1, 2011, the System used an assumption of a 2% annual COLA each year in developing liabilities and contribution rates. The System did not have an automatic COLA provision, but ad hoc COLAs had historically been granted by the Legislature. The 2011 Oklahoma Legislature passed House Bill 2132 which removed COLAs from the definition of “non-fiscal retirement bills” in the Oklahoma Pension Legislation Actuarial Analysis Act (OPLAAA). The impact of this change was to make any COLA bill subject to all of the requirements of OPLAAA, including the requirement that such bills provide adequate funding to pay the cost. As a result, beginning with the July 1, 2011 actuarial valuation, the liabilities of the System have been calculated without a COLA assumption. Also, as noted earlier in the report, should funding of future COLAs be provided by the System, the COLAs should be included in the actuarial valuation.



## SECTION 3 – SYSTEM LIABILITIES

### Oklahoma Public Employees Retirement System

**Table 4**

**Present Value of Future Benefits  
As of July 1, 2017**

	Regular	Elected Officials	Hazardous Duty	Total
1. Active Employees				
a. Retirement Benefit	\$ 3,841,802,910	\$ 197,493,085	\$ 206,213,189	\$ 4,245,509,184
b. Withdrawal Benefit	225,525,344	9,081,971	11,147,633	245,754,948
c. Pre-Retirement Death Benefit	92,578,656	2,595,246	3,124,097	98,297,999
d. Disability Benefit	85,663,590	3,491,782	3,804,144	92,959,516
e. Return of Member Contributions	46,117,791	528,343	5,338,187	51,984,321
f. Supplemental Medical Benefit	165,537,171	4,653,546	8,996,209	179,186,926
g. Subtotal	\$ 4,457,225,462	\$ 217,843,973	\$ 238,623,459	\$ 4,913,692,894
2. Inactive Nonvested Members				\$ 46,782,203
3. Inactive Vested Members				364,117,823
4. Return of Excess Contributions				411,010
5. Disabled Members				119,634,562
6. Retirees				5,060,867,716
7. Beneficiaries				346,191,668
8. Supplemental Medical Benefit for Retirees				193,992,317
9. Total Inactive Liability Sum of (2) through (8)				\$ 6,131,997,299
10. Total PVFB (1g) + (9)				\$ 11,045,690,193



## SECTION 3 – SYSTEM LIABILITIES

### Oklahoma Public Employees Retirement System

**Table 5**

#### **Actuarial Accrued Liability As of July 1, 2016**

	Regular	Elected Officials	Hazardous Duty	Total
1. Present Value of Future Benefits for Active Members				
a. Retirement Benefit	\$ 3,841,802,910	\$ 197,493,085	\$ 206,213,189	\$ 4,245,509,184
b. Withdrawal Benefit	225,525,344	9,081,971	11,147,633	245,754,948
c. Pre-Retirement Death Benefit	92,578,656	2,595,246	3,124,097	98,297,999
d. Disability Benefit	85,663,590	3,491,782	3,804,144	92,959,516
e. Return of Member Contributions	46,117,791	528,343	5,338,187	51,984,321
f. Supplemental Medical Benefit	165,537,171	4,653,546	8,996,209	179,186,926
g. Subtotal	\$ 4,457,225,462	\$ 217,843,973	\$ 238,623,459	\$ 4,913,692,894
2. Present Value of Future Normal Costs for Active Members				
a. Retirement Benefit	\$ 798,889,138	\$ 26,705,464	\$ 60,143,593	\$ 885,738,195
b. Withdrawal Benefit	136,398,149	6,033,562	6,335,962	148,767,673
c. Pre-Retirement Death Benefit	23,607,007	461,586	1,014,575	25,083,168
d. Disability Benefit	28,523,652	814,344	1,409,987	30,747,983
e. Return of Member Contributions	114,002,943	3,109,977	10,419,203	127,532,123
f. Supplemental Medical Benefit	42,349,360	1,119,527	2,735,094	46,203,981
g. Subtotal	\$ 1,143,770,249	\$ 38,244,460	\$ 82,058,414	\$ 1,264,073,123
3. Present Value of Future Benefits for Inactive Members (Table 4)				\$ 6,131,997,299
4. Total Actuarial Accrued Liability (1g) - (2g) + (3)				\$ 9,781,617,070



## SECTION 4 – EMPLOYER CONTRIBUTIONS

---

### Oklahoma Public Employees Retirement System

In the previous two sections, attention has been focused on the assets and the liabilities (present value of future benefits) of the System. A comparison of Tables 3 and 4 indicates there is a shortfall in current actuarial assets needed to meet the present value of all future benefits for current members and beneficiaries.

In an active system, there will always be a difference between the assets and the present value of all future benefits. An actuarial valuation determines a schedule of future contributions that will provide for this funding in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. Under an actuarial cost method, the contributions required to meet the difference between current assets and current liabilities are allocated each year between two elements: (1) the normal cost; and (2) the payment on the unfunded actuarial accrued liability.

The term “fully funded” is often applied to a system in which contributions at the normal cost rate are sufficient to pay for the benefits of existing employees as well as for those of new employees. More often than not, systems are not fully funded, either because of past benefit improvements that have not been completely funded and/or because of actuarial deficiencies that have occurred because experience has not been as favorable as anticipated under the actuarial assumptions. Under these circumstances, an unfunded actuarial accrued liability (UAAL) exists.

#### Description of Rate Components

The actuarial cost method used by the System is the traditional Entry Age Normal (EAN) cost method as a level percent of pay. Under the EAN cost method, the actuarial present value of each member’s projected benefit is allocated on a level basis over the member’s compensation between the entry age of the member and the assumed exit age. The portion of the actuarial present value allocated to the valuation year is called the normal cost. The actuarial present value of benefits allocated to prior years of service is called the actuarial accrued liability. The unfunded actuarial accrued liability represents the difference between the actuarial accrued liability and the actuarial value of assets as of the valuation date. The unfunded actuarial accrued liability is calculated each year and reflects experience gains/losses.

Effective with the July 1, 2008 valuation, the UAAL is amortized as a level percent of payroll over a closed 20-year period commencing July 1, 2007, with 10 years remaining in the amortization period. For July 1, 1998 and prior years, the unfunded actuarial accrued liability was amortized over 25 years from July 1, 1987. For the July 1, 1999 valuation, the amortization period was changed to 40 years from July 1, 1987. For members participating in the Pathfinder defined contribution plan, the employer sends to OPERS the difference between the OPERS required rate (16.5% for state members) and the amount required for the employer match. These extra contributions to OPERS allow the use of the level percent of payroll amortization method since they are expected to produce a payment stream that is constant, if not increasing, as a percent of covered payroll.

#### Contribution Rate Summary

The normal cost rate is developed in Table 6. Table 7 illustrates the development of the contribution rate for amortization of the unfunded actuarial accrued liability. Table 8 explains the development of the total actuarial contribution rate.





## SECTION 4 – EMPLOYER CONTRIBUTIONS

### Oklahoma Public Employees Retirement System

**Table 6**

**Normal Cost Contribution Rates  
As a Percentage of Salary**

	Regular	Elected Officials	Hazardous Duty	Total	% of Pay
1. Normal Cost					
a. Retirement Benefit	\$ 108,533,226	\$ 4,839,961	\$ 8,570,719	\$ 121,943,906	7.22%
b. Withdrawal Benefit	16,476,994	999,661	928,838	18,405,493	1.09%
c. Pre-Retirement Death Benefit	3,038,328	82,480	155,888	3,276,696	0.19%
d. Disability Benefit	3,487,744	130,642	209,570	3,827,956	0.23%
e. Return of Member Contributions	15,266,247	565,995	1,532,618	17,364,860	1.03%
f. Supplemental Medical Benefit	7,422,718	234,270	432,005	8,088,993	0.48%
g. Total	\$ 154,225,257	\$ 6,853,009	\$ 11,829,638	\$ 172,907,904	10.24%
2. Estimated Payroll for the Year	\$ 1,568,802,151	\$ 38,739,453	\$ 81,002,252	\$ 1,688,543,856	
3. Normal Cost Rate (1g)/(2)	9.83%	17.69%	14.60%	10.24%	



## SECTION 4 – EMPLOYER CONTRIBUTIONS

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### Oklahoma Public Employees Retirement System

Table 7

#### Unfunded Actuarial Accrued Liability Contribution Rate

1. Actuarial Present Value of Future Benefits	\$	11,045,690,193
2. Actuarial Present Value of Future Normal Costs		<u>1,264,073,123</u>
3. Actuarial Accrued Liability (1) - (2)	\$	9,781,617,070
4. Actuarial Value of Assets		<u>9,241,292,469</u>
5. Unfunded Actuarial Accrued Liability (UAAL) (3) - (4)	\$	540,324,601
6. Amortization of UAAL over 20 years from July 1, 2007 (assumed mid-year) *	\$	64,619,331
7. Total Estimated Payroll for Year Ending June 30, 2018	\$	1,808,043,366
8. Amortization as a Percent of Payroll		3.57%

\*The UAAL is amortized as a level percent of payroll, assuming payroll increases 3.50% per year.



## SECTION 4 – EMPLOYER CONTRIBUTIONS

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### Oklahoma Public Employees Retirement System

**Table 8**

**Actuarial Contribution Rate**

	July 1	
	2017	2016
1. Total Normal Cost Rate	10.24%	10.01%
2. Amortization of UAAL <sup>1</sup>	3.57%	3.79%
3. Budgeted Expenses <sup>2</sup>	<u>0.40%</u>	<u>0.37%</u>
4. Total Actuarial Contribution Rate (1) + (2) + (3)	14.21%	14.17%
5. Estimated Member Contribution Rate	<u>4.14%</u>	<u>4.10%</u>
6. Employer Actuarial Contribution Rate (4) - (5)	10.07%	10.07%

<sup>1</sup> Amortization of UAAL is a level percent of payroll. Recognizes contributions received on behalf of defined contribution plan members.

<sup>2</sup> Provided by the System.



## SECTION 4 – EMPLOYER CONTRIBUTIONS

### Oklahoma Public Employees Retirement System

**Table 9**

#### Calculation of Actuarial Gain/(Loss)

1. Expected Actuarial Accrued Liability		
a. Actuarial accrued liability at July 1, 2016	\$	9,427,809,623
b. Normal cost at mid-year		179,247,674
c. Benefit payments for fiscal year ending June 30, 2017		(608,911,580)
d. Interest on (a), (b), and (c)		668,213,392
e. Change in assumptions		249,298,444
f. Amendments		0
g. Expected actuarial accrued liability as of July 1, 2017	\$	9,915,657,553
(a) + (b) + (c) + (d) + (e) + (f)		
2. Actuarial Accrued Liability at July 1, 2017	\$	9,781,617,070
3. Actuarial Accrued Liability Gain/(Loss) (1g) - (2)	\$	134,040,483
4. Expected Actuarial Value of Assets		
a. Actuarial value of assets at July 1, 2016	\$	8,790,886,036
b. Contributions for fiscal year ending June 30, 2017		358,615,175
c. Benefit payment and administrative expenses for fiscal year ending June 30, 2017		(614,308,717)
d. Interest on (a), (b), and (c)		628,232,518
e. Expected actuarial value of assets as of July 1, 2017	\$	9,163,425,012
(a) + (b) + (c) + (d)		
5. Actuarial Value of Assets at July 1, 2017	\$	9,241,292,469
6. Actuarial Value of Assets Gain/(Loss) (5) - (4e)	\$	77,867,457
7. Net Actuarial Gain/(Loss) (3) + (6)	\$	211,907,940



## SECTION 4 – EMPLOYER CONTRIBUTIONS

### Oklahoma Public Employees Retirement System

**Table 10**

#### Summary of Contribution Requirements

	Actuarial Valuation as of		Percent Change
	July 1, 2017	July 1, 2016	
1. Expected Annual Payroll	\$ 1,688,543,856	\$ 1,790,809,603	(5.7%)
2. Total Normal Cost	\$ 172,907,904	\$ 179,247,674	(3.5%)
3. Unfunded Actuarial Accrued Liability	\$ 540,324,601	\$ 636,923,587	(15.2%)
4. Amortization of Unfunded Actuarial Accrued Liability over 20 Years from July 1, 2007*	\$ 64,619,331	\$ 69,607,963	(7.2%)
5. Budgeted Expenses (Provided by the System)	\$ 6,693,277	\$ 6,681,099	0.2%
6. Total Required Contribution (2) + (4) + (5)	\$ 244,220,512	\$ 255,536,736	(4.4%)
7. Estimated Member Contributions	\$ 69,940,845	\$ 73,433,064	(4.8%)
8. Required Employer Contribution (6) - (7)	\$ 174,279,667	\$ 182,103,672	(4.3%)
9. Previous Year's Actual Contribution			
a. Member	\$ 70,276,234	\$ 73,800,890	(4.8%)
b. Employer	288,338,941	296,249,191	(2.7%)
c. Total	\$ 358,615,175	\$ 370,050,081	(3.1%)

\*Amortization of UAAL is a level percent of payroll.



## **SECTION 5— ACCOUNTING AND OTHER INFORMATION**

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### **Oklahoma Public Employees Retirement System**

Governmental Accounting Standards Board Statement No. 25, Financial Reporting for Defined Benefit Pension Plans as amended by GASB 50, (referred to as GASB 25), establishes financial reporting standards for defined benefit pension plans. Beginning with fiscal years ending after June 15, 2014, a new standard, GASB 67, replaces GASB 25 for Plan reporting. A separate report will provide this information.

In this section we also provide exhibits showing the funding progress, present value of accumulated benefits, and an exhibit showing the expected benefit payments for the System.



## SECTION 5— ACCOUNTING AND OTHER INFORMATION

### Oklahoma Public Employees Retirement System

**Table 11**

#### Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a Percent of Covered Payroll ((b) - (a))/(c)
7/1/2008	\$6,491,928,362	\$8,894,287,254	\$2,402,358,892	73.0%	\$1,682,663,413	142.8%
7/1/2009	6,208,245,334	9,291,457,837	3,083,212,503	66.8%	1,732,975,532	177.9%
7/1/2010	6,348,416,407	9,622,627,833	3,274,211,426	66.0%	1,683,697,139	194.5%
7/1/2011	6,598,627,939	8,179,767,661	1,581,139,722	80.7%	1,570,500,148	100.7%
7/1/2012	6,682,200,296	8,334,637,900	1,652,437,604	80.2%	1,633,837,374	101.1%
7/1/2013	6,978,873,421	8,556,121,906	1,577,248,485	81.6%	1,695,347,809	93.0%
7/1/2014	7,759,257,716	8,753,669,153	994,411,437	88.6%	1,744,041,536	57.0%
7/1/2015	8,420,306,645	8,996,125,901	575,819,256	93.6%	1,808,972,785	31.8%
7/1/2016	8,790,886,036	9,427,809,623	636,923,587	93.2%	1,790,809,603	* 35.6%
7/1/2017	9,241,292,469	9,781,617,070	540,324,601	94.5%	1,688,543,856	* 32.0%

\*Covered Payroll shown is for the defined benefit plan members only although employer contributions toward the UAAL are being received on behalf of defined contribution plan members.





## SECTION 5— ACCOUNTING AND OTHER INFORMATION

### Oklahoma Public Employees Retirement System

**Table 12**

#### **Actuarial Present Value of Accumulated Benefits**

The actuarial present value of vested and non-vested accumulated benefits is computed on an ongoing System-wide basis in order to provide information on benefit liabilities for historical purposes. In this calculation, a determination is made of all benefits earned by current participants as of the valuation date; the actuarial present value is then computed using demographic assumptions and an assumed interest rate. Future salary or accrual of future benefit service are not considered. This information may not be useful as an indication of the funds needed to settle liabilities.

	July 1	
	2017	2016
Vested benefits		
Active members	\$ 2,118,471,891	\$ 2,072,766,675
Terminated vested members	364,117,823	350,358,853
Unclaimed contributions	46,782,203	44,418,135
Limited benefit	411,010	459,840
Retirees and beneficiaries	5,526,693,946	5,173,659,555
Supplemental medical insurance premiums	329,623,176	323,142,549
Total vested benefits	\$ 8,386,100,049	\$ 7,964,805,607
Nonvested benefits for active members	\$ 247,620,957	\$ 257,012,732
<b>Total accumulated benefits</b>	<b>\$ 8,633,721,006</b>	<b>\$ 8,221,818,339</b>
Market value of assets available for benefits	\$ 9,229,499,873	\$ 8,435,578,907
Funded ratio	106.9%	102.6%
<b>Number of members</b>		
Vested members		
Active members	19,637	19,881
Terminated vested members	5,951	5,946
Retirees and beneficiaries	34,579	33,749
Total vested members	60,167	59,576
Nonvested active members	19,236	21,925
<b>Total members</b>	<b>79,403</b>	<b>81,501</b>



## SECTION 5— ACCOUNTING AND OTHER INFORMATION

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### Oklahoma Public Employees Retirement System

**Table 12 (continued)**

**Actuarial Present Value of Accumulated Benefits**

A statement of changes in the actuarial present value of accumulated System benefits follows. This statement shows the effect of certain events on the actuarial present value shown on the previous page.

Present value of accrued benefit as of July 1, 2016	\$ 8,221,818,339
Increase/(decrease) during the year attributable to:	
Benefits accrued and (gains)/losses	446,419,265
Increase due to interest	574,394,982
Benefits paid	(608,911,580)
Plan provision change	0
Net increase/(decrease)	\$ 411,902,667
Present value of accrued benefit as of July 1, 2017	\$ 8,633,721,006



## SECTION 5— ACCOUNTING AND OTHER INFORMATION

### Oklahoma Public Employees Retirement System

**Table 13**

#### **Projected Benefit Payments**

The table below shows estimated benefits expected to be paid over the next ten years, based on the assumptions used in this valuation. The “Actives” column shows the benefits expected to be paid to members currently active on July 1, 2017. The “Retirees” column shows benefits expected to be paid to members receiving benefit payments as of July 1, 2017 or to members who have terminated employment and are entitled to a deferred vested benefit.

#### **Retirement, Survivor and Withdrawal Benefits**

<b>Year Ending June 30</b>		<b>Actives</b>		<b>Retirees</b>		<b>Total</b>
2018	\$	38,299,000	\$	580,085,000	\$	618,384,000
2019		68,726,000		571,425,000		640,151,000
2020		98,886,000		562,212,000		661,098,000
2021		127,798,000		552,034,000		679,832,000
2022		156,299,000		541,184,000		697,483,000
2023		183,803,000		529,787,000		713,590,000
2024		210,441,000		517,839,000		728,280,000
2025		237,377,000		505,619,000		742,996,000
2026		263,768,000		492,799,000		756,567,000
2027		289,703,000		478,802,000		768,505,000

#### **Supplemental Medical Premium Benefits**

<b>Year Ending June 30</b>		<b>Actives</b>		<b>Retirees</b>		<b>Total</b>
2018	\$	1,643,000	\$	18,287,000	\$	19,930,000
2019		3,346,000		18,066,000		21,412,000
2020		4,996,000		17,815,000		22,811,000
2021		6,538,000		17,532,000		24,070,000
2022		8,012,000		17,208,000		25,220,000
2023		9,366,000		16,880,000		26,246,000
2024		10,624,000		16,538,000		27,162,000
2025		11,790,000		16,232,000		28,022,000
2026		12,878,000		15,913,000		28,791,000
2027		13,877,000		15,522,000		29,399,000



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

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### Oklahoma Public Employees Retirement System

Following is a summary of the major System provisions used in the actuarial valuation of the System.

<b>Effective date and fiscal year</b>	The System became effective January 1, 1964. The fiscal year is July 1 to June 30.						
<b>Administration</b>	The System is administered by the Oklahoma Public Employees Retirement System Board of Trustees. The Board acts as the fiduciary for the investment and administration of the System.						
<b>Employees included</b>	<p>All permanent employees of the State of Oklahoma, and any other employer such as a county, county hospital, city or town, conservation districts, circuit engineering districts, and any trust in which a county, city or town participates and is the primary beneficiary, are eligible to join if:</p> <ul style="list-style-type: none"><li>a) the employee is not eligible for or participating in another retirement system authorized under Oklahoma law, is covered by Social Security and is not participating in the U.S. Civil Service Retirement System; and</li><li>b) the employee is scheduled for at least 1,000 hours per year and salary is not less than the hourly rate of the monthly minimum wage for State employees (for employees of local government employers, not less than the hourly rate of the monthly minimum wage for such employees).</li></ul> <p>Membership is mandatory for new eligible employees on the first of the month following employment. Effective November 1, 2015, the Plan is closed to most new State employees. Any employee with service in the System prior to November 1, 2015 will continue to be a member or will join the System upon re-employment with a participating employer.</p>						
<b>Employer and employee contributions</b>	<p>Most State employees except Hazardous Duty employees and most elected officials:</p> <table><tr><td>Employee:</td><td>3.5%</td></tr><tr><td>Employer:</td><td>16.5%</td></tr><tr><td>Total:</td><td>20.0%</td></tr></table>	Employee:	3.5%	Employer:	16.5%	Total:	20.0%
Employee:	3.5%						
Employer:	16.5%						
Total:	20.0%						



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

### Oklahoma Public Employees Retirement System

#### Employer and employee contributions (continued)

Prior to July 1, 2006 the employee contribution rate varied on pay above/below \$25,000 as shown in the chart at the end of this section. This plan provision was changed by the 2006 Legislature.

Before November 1, 2010, elected officials selected a contribution rate of 4.5%, 6%, 7.5%, 8.5%, 9% or 10% which determined the computation factor used in calculating their benefit. Elected officials elected or appointed on or after November 1, 2010 (but before November 1, 2011) were limited to selecting either the 4.5% contribution rate or the 10% contribution rate. Those elected after November 1, 2011 contribute at 3.5% like most non-elected members.

Contributions for Hazardous Duty employees are summarized at the end of this appendix.

Local government employees contribute from 3.5% to 8.5% of pay, depending on the rate chosen by their employers.

Starting in 2004, regular members may make an election to contribute an additional 2.91% of pay and increase their accrual rate for future years of service to 2.5% (referred to as Step-Up Option). Elected officials elected on or after November 1, 2011 may also elect Step-Up.

Contributions are based on compensation defined by the Board.

#### Contribution Summary: Regular State Contributions (By Statute) For Pay Under \$25,000

Fiscal Year	Employer Contribution	Employee Contribution	Total Contribution	Applicable Salary Cap
1994-1995	11.5%	2.0%	13.5%	\$50,000
1995-1996	11.5%	2.0%	13.5%	\$60,000
1996-1997	12.0%	2.5%	14.5%	\$70,000
1997-1998	12.5%	3.0%	15.5%	\$80,000
1998-1999	12.5%	3.0%	15.5%	No Cap
1999-2005	10.0%	3.0%	13.0%	No Cap
2005-2006	11.5%	3.0%	14.5%	No Cap



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

### Oklahoma Public Employees Retirement System

#### Employer and employee contributions (continued)

For Pay Between \$25,000 and Cap				
Fiscal Year	Employer Contribution	Employee Contribution	Total Contribution	Applicable Salary Cap
1994-1995	11.5%	3.5%	15.0%	\$50,000
1995-1996	11.5%	3.5%	15.0%	\$60,000
1996-1997	12.0%	3.5%	15.5%	\$70,000
1997-1998	12.5%	3.5%	16.0%	\$80,000
1998-1999	12.5%	3.5%	16.0%	No Cap
1999-2005	10.0%	3.5%	13.5%	No Cap
2005-2006	11.5%	3.5%	15.0%	No Cap

For All Pay			
Fiscal Year	Employer Contribution	Employee Contribution	Total Contribution
2006-2007	12.5%	3.5%	16.0%
2007-2008	13.5%	3.5%	17.0%
2008-2009	14.5%	3.5%	18.0%
2009-2010	15.5%	3.5%	19.0%
2010-2011	15.5%	3.5%	19.0%
2011-2012	16.5%	3.5%	20.0%
2012-2013	16.5%	3.5%	20.0%
2013-2014	16.5%	3.5%	20.0%
2014-2015	16.5%	3.5%	20.0%
2015-2016	16.5%	3.5%	20.0%

#### Years of Service

##### Prior Service

All service of the employee prior to the employer's entry date is credited prior service providing the participating employer joined on or before January 1, 1975. Prior service for employees of employers who join after January 1, 1975, may be purchased by the employee. Prior service is allowed for certain active wartime military service (maximum 5 years credit) for members employed prior to July 1, 2000 and for employment with public schools or Board of Regents for Higher Education prior to July 1943. Service need not be continuous employment to be credited.



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

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### Oklahoma Public Employees Retirement System

#### Years of Service

##### Participating Service

After the employer's entry date, a member's participating service is credited for all periods of employment for which required contributions are made. Service is prorated according to hours worked per month on and after July 1, 1979. Certain active wartime military service is credited, provided the contribution accumulation is not withdrawn. Active and retired members are credited with additional participating service based on their accumulated contributions prior to June 30, 1977 (if not withdrawn prior to retirement), according to the following:

<u>Member Accumulation</u>				<u>Additional Years</u>
\$	1	to	\$ 500	1
	501	to	1,000	2
	1,001	to	1,500	3
	1,501	to	2,000	4
	2,001	to	More	5

A member who has withdrawn his or her contributions and later returns to membership may repay the amount withdrawn plus interest as determined by the Board to reinstate participating service which was canceled by his or her withdrawal.

A member may receive credit for those years of service as an elected official if the member is not receiving credit for that service in any other public retirement system. The member must pay an amount equal to the actuarial cost to fund the difference between the member's projected benefits with and without the additional service credit.

The total participating service of a member who retires or terminates employment and elects a vested benefit shall include up to one hundred thirty (130) days of unused sick leave accumulated subsequent to August 1, 1959, during the member's employment with any participating employer. Such credit shall be added in terms of whole months. If unused sick leave entitles the member to an additional year of service, the additional cost is borne by the employer. For members joining on or after November 1, 2012, any additional months of unused sick leave credit will be added to the service credit without rounding the total service up to the next higher year. Any cost to the employer will be based on the actual number of months of unused sick leave.





## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

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### Oklahoma Public Employees Retirement System

#### Years of Service

##### **Participating Service** (continued)

A member may receive credit for those years of credited service accumulated while a member of the Oklahoma Firefighters Pension and Retirement System, the Oklahoma Police Pension and Retirement System, the Uniform Retirement System for Justices and Judges, the Oklahoma Law Enforcement Retirement System, or the Teachers' Retirement System of Oklahoma, if the member is not receiving or eligible to receive retirement credit or benefits from this service in any other public retirement system. The member may receive credit for this service by paying the amount actuarially determined to cover the cost of the previous service.

##### **Credited Service**

Credited service equals prior service plus participating service. The result is rounded up to the next year if the number of remaining months is equal to or greater than six. Credited service of members joining on or after November 1, 2012 will not be rounded up. Members will be credited with, and their benefit calculation will be computed on, the actual number of years and months of credited service.

#### Compensation

The member's basic salary and wages as defined by the Board of Trustees, including amounts contributed to deferred compensation plans. Overtime and moving expenses are excluded.

#### Final average compensation

The average of the thirty-six (36) highest months of compensation earned within the last ten (10) years of participating service. For members hired on or after July 1, 2013, final average compensation is the average of the sixty (60) highest months of compensation earned within the last ten (10) years of participating service. Final average compensation will be subject to any applicable salary caps and based on salary on which contributions have been made.

For all members hired prior to July 1, 1995, the minimum final average compensation is \$13,800. For members hired on or after July 1, 1995, no minimum is applied until the member has fifteen (15) years of service. For members with between fifteen (15) and twenty (20) years of service, the minimum final average compensation is \$6,900. For a member with more than twenty (20) years of service, the minimum is \$13,800.



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

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### Oklahoma Public Employees Retirement System

#### Normal retirement date

Normal retirement is the earliest of: (1) first day of the month coinciding with or next following the 62<sup>nd</sup> birthday; or, (2) the first day of the month coinciding with or following the date at which the sum of a member's age and number of years of credited service total eighty (80) if the member was hired prior to July 1, 1992; or (3) following the date at which the sum of member's age and number of years of credited service total ninety (90) if the member was hired after July 1, 1992. Members employed after January 1, 1983 must complete at least six (6) years of full-time equivalent employment with a participating employer before receiving any retirement benefits.

For regular employees hired on or after November 1, 2011, the retirement age is 65. Alternatively, they may retire under the "Rule of 90" if they are at least age 60.

The normal retirement date for elected officials is the first of the month coinciding with or following the official's 60th birthday or the first day of the month coinciding with or following the date at which the sum of the member's age and years of credited service total eighty (80).

For elected officials appointed or elected on or after November 1, 2011, the retirement age is 65 with a minimum of eight (8) years of elected service, or age 62 if they have ten (10) years of elected service.

#### Normal retirement benefit

The benefit on or after normal retirement, payable monthly for life to non-elected members, is as follows:

2% of final average compensation multiplied by years of credited service.

For members who have elected the Step-Up Option, a 2.5% multiplier is applied to the "stepped-up" full years. Elected officials appointed or elected on or after November 1, 2011, are also eligible for the Step-Up Option.



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

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### Oklahoma Public Employees Retirement System

#### Normal retirement benefit (continued)

The benefit payable monthly for life to elected officials is the greater of 1) the preceding benefit, or 2) the benefit calculated using highest annual compensation as an elected official times credited service multiplied by the following applicable computation factor:

<u>% of Compensation Contributed</u>	<u>% of Highest Annual Compensation</u>
4.5%	1.9%
6.0%	2.5%
7.5%	3.0%
8.5%	3.4%
9.0%	3.6%
10.0%	4.0%

Elected officials who became members after July 1, 1990 must participate in the System as elected officials for at least six (6) years to qualify for the elected official benefit formula on all years of previous non-elected participating service. For elected officials elected or appointed on or after November 1, 2011, the vesting period is eight (8) years.

OPERS members who are elected after August 21, 2008 have a benefit cap of 100% of their highest annual salary. Elected officials who become members after August 21, 2008 (but before November 1, 2011) receive a benefit that consists of two separate calculations. Their non-elected years are multiplied by 2% and their elected years are multiplied by the applicable percentage selected and paid for by the members.

Elected officials who are appointed or elected on or after November 1, 2010 (but before November 1, 2011) have two benefit multiplier options: 1.9% and 4.0%. Those elected after November 1, 2011 contribute at 3.5% like most non-elected members, and have a multiplier of 2%. In addition, they must be age 62 with at least ten (10) years as an elected official, or age 65 with at least eight (8) years as an elected official, to qualify for retirement.



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

---

### Oklahoma Public Employees Retirement System

#### Early retirement benefit

A member with at least ten (10) years of participating service may retire as early as age 55. The benefit is determined by the normal retirement formula based on years of credited service and Final Average Compensation (highest annual compensation for elected officials) at termination. The percentage payable at early retirement age is:

<u>Elected Officials</u>		<u>Other Members</u>	
Age	Percentage	Age	Percentage
60	100%	62	100.00%
59	94	61	93.33
58	88	60	86.67
57	82	59	80.00
56	76	58	73.33
55	70	57	66.67
		56	63.33
		55	60.00

The following tables apply to regular and hazardous duty employees employed, or elected officials appointed or elected, on or after November 1, 2011:

<u>Elected Officials</u>		<u>Other Members</u>	
Age	Percentage	Age	Percentage
62	100.00%	65	100.00%
61	93.33	64	93.33
60	86.67	63	86.67
		62	80.00
		61	73.33
		60	66.67



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

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### Oklahoma Public Employees Retirement System

#### **Disability benefit**

A member with at least eight (8) years of credited service is eligible for a disability benefit provided the member qualifies for disability benefits as certified by the Social Security Administration or the Railroad Retirement Board and having a date of disability within one year after the date last physically on the job. The benefit is determined by the normal retirement formula based on service and salary history at date of disability. The benefit is payable immediately without actuarial reduction. Option A is the only available form of survivor payment for non-elected members.

#### **Vested benefit**

A member who terminates after eight (8) years of credited service (six years for most elected officials) is eligible for a vested benefit determined by the normal retirement formula, based on service and compensation to date of termination.

The benefit is payable at age 62 (or age 60 for most elected officials), provided the member's contribution accumulation is not withdrawn and the member has at least six (6) years of full-time equivalent employment. A member with ten (10) or more years of service also has the option of reduced benefits at early retirement age.

Members terminating with less than eight (8) years (or six years for most elected officials) of credited service may elect to receive a refund of their member contribution accumulation.

A limited additional retirement service benefit of \$200 per month is payable up to the total of excess contributions paid by the member for those vested members as of July 1, 1998. This is not applicable for active members who received a transfer of excess contributions or retired members as of July 1, 1998.

For regular employees employed on or after November 1, 2011, a vested benefit is not payable for Normal Retirement until age 65. For elected officials appointed or elected on or after November 1, 2011, a vested benefit requires at least eight (8) years of elected service and is not payable for normal retirement until age 65.



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

---

### Oklahoma Public Employees Retirement System

#### **Pre-retirement death benefit**

For a deceased active member who had met normal, early or vested retirement provisions, the spouse may elect a spouse's benefit. This spouse's benefit is the amount that would have been paid if the member had instead retired and elected the joint and 100% survivor option (Option B). If named as the designated beneficiary, the spouse may elect a refund of the deceased member's contribution accumulation in lieu of the Option B monthly benefit.

In addition to the provision above, the eligible spouse of a deceased elected official with at least six (6) years of elected service or eight (8) years if elected on or after November 1, 2011, and married at least three (3) years immediately preceding death, may elect to receive 50% of the maximum benefit the member would have been eligible to receive. The starting date of benefits is the date the deceased member would have been eligible for early or normal retirement. Benefits cease upon death or remarriage of the surviving spouse.

Any other designated beneficiary of a member other than an eligible spouse will receive a refund of the deceased member's contribution accumulation.

#### **Post-retirement death benefit**

Upon the death of a retired member, a \$5,000 lump-sum death benefit will be paid to the member's beneficiary, or estate if there is no beneficiary.



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

---

### Oklahoma Public Employees Retirement System

<b>Optional form of retirement benefits</b>	<p>The normal form of benefit for an unmarried member, other than an elected official, is a single life monthly annuity with a guaranteed refund of the unpaid employee contribution accumulation. The normal form for a married member is a 50% joint and survivor annuity benefit. Optional forms of payment with actuarial reduction are available to all members retiring under the normal retirement, early retirement or vested retirement provision. These options are:</p> <p>Option A – Joint and 50% Survivor Annuity with a return to the unreduced amount if the joint annuitant dies.</p> <p>Option B – Joint and 100% Survivor Annuity with a return to the unreduced amount if the joint annuitant dies.</p> <p>Option C – Life Annuity with a minimum of 120 monthly payments.</p> <p>For married members, spousal consent is required for any option other than Option A, or a joint annuitant other than the spouse.</p> <p>Medicare Gap Benefit Option allows members under age 65 to receive a higher benefit before age 65 (to help pay health insurance premiums) and a permanently lower benefit after age 65.</p>
<b>Post-retirement medical benefit</b>	<p>The System will contribute the lesser of \$105 per month or the Medicare Supplement Premium to the Office of Management and Enterprise Services, Employees Group Insurance Division (or other eligible employer health plans) for members receiving retirement benefits.</p>
<b>Expenses</b>	<p>The expenses of administering the System are paid from the retirement trust fund.</p>



## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

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### Oklahoma Public Employees Retirement System

#### **Hazardous Duty Members (Department of Corrections Officers, Oklahoma Military Department Firefighters) Benefits**

Members covered by the Hazardous Duty Provisions have the retirement eligibility requirements, contribution rates and benefit formula described below.

#### **Department of Corrections:**

The normal retirement age is the earliest of: twenty (20) years of service as a member covered by the Department of Corrections Hazardous Duty Provisions; or, the first day of the month coinciding with or next following the 62<sup>nd</sup> birthday; or, the first day of the month coinciding with or following the date at which the sum of a member's age and number of years of credited service total eighty (80), if the member was hired prior to July 1, 1992, or following the date at which the sum of a member's age and number of years of credited service total ninety (90) if the member was hired after July 1, 1992. Members employed after January 1, 1983 must complete at least six (6) years of full-time equivalent employment with a participating employer before receiving any retirement benefits. The benefit formula is 2.5% of final average compensation, multiplied by the number of years of service as an eligible officer for service, not exceeding twenty (20) years. For service in excess of twenty (20) years, the benefit formula is 2% of final average compensation.

For hazardous duty employees hired on or after November 1, 2011, the normal retirement age is age 65. Alternatively, they may retire under the earliest of (i) the "Rule of 90" if they are at least age 60 or (ii) twenty (20) years of service as a member covered by hazardous duty provisions.

Members eligible for these benefits with at least five (5) years of experience in their positions on or after June 30, 2004 remain eligible to retire after twenty (20) years even if they transfer to positions within DOC that are not eligible to retire after twenty (20) years.

Special Surviving Spouse and Child benefits for any member employed by the Department of Corrections (DOC) killed or mortally wounded during the performance of duty are equal to 2.5% of final average monthly compensation multiplied by the greater of the member's actual service or twenty (20) years.

In addition, an amount of \$400 per month will be paid as long as a child of the deceased member is under the age of 18 (or 22 if enrolled full time at an institution of higher education).





## APPENDIX A – SUMMARY OF SYSTEM PROVISIONS

### Oklahoma Public Employees Retirement System

**Hazardous Duty Members  
(Department of Corrections Officers,  
Oklahoma Military Department  
Firefighters) Benefits**  
(continued)

Contributions for members covered by the Department of Corrections Hazardous Duty Provisions are:

	<u>Year</u>	<u>Up to \$25,000</u>	<u>Above \$25,000</u>
	1994/1995	6.5%	8.0%
	1995/1996	6.5%	8.0%
	1996/1997	7.0%	8.0%
	1997/1998	7.5%	8.0%
	First 20 Years of <u>Service</u>	<u>Service Beyond 20 Years</u>	
		<u>Up to \$25,000</u>	<u>Above \$25,000</u>
July 1998 – June 1999	8.0%	N/A	N/A
July 1999 – June 2000	8.0%	N/A	N/A
July 2000 – June 2010	8.0%	N/A	N/A
July 2010 and after	8.0%	3.5%	3.5%

#### Oklahoma Military Department Firefighters:

The benefit for Oklahoma Military Department firefighters who began employment July 1, 2002 and after is based on a 2.5% benefit multiplier. They are also eligible for full benefits after twenty (20) years as a firefighter and their employee contribution rate is 8%. Oklahoma Military Department firefighters employed prior to July 1, 2002 were given a one-time option to: (a) have their benefit formula, retirement eligibility, and employee contribution rate remain unchanged; (b) apply the new provisions (including the new contribution rate) to service after January 1, 2003; or (c) apply the new benefit formula and retirement eligibility to all of the member's service, apply the 8% contribution rate for service after July 1, 2002, and make a contribution equal to the increase in the actuarial value of the member's retirement benefit.

In contrast to DOC members, the 2.5% formula and 8% contribution rate applies to service after twenty (20) years.



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### Actuarial Cost Method

Liabilities and contributions shown in this report are computed using the Individual Entry Age method of funding. Sometimes called the “funding method,” this is a particular technique used by actuaries for establishing the amount of the annual actuarial cost of pension benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily the annual contribution to the System is comprised of (1) the normal cost; and (2) an amortization payment on the unfunded actuarial accrued liability.

Under the Entry Age Actuarial Cost Method, the **Normal Cost** is computed as the level percentage of pay which, if paid from the earliest time each member would have been eligible to join the System had it existed (thus entry age) until his retirement or termination, would accumulate with interest at the rate assumed in the valuation to a fund sufficient to pay all benefits under the System.

The **Actuarial Accrued Liability** under this method, at any point in time, is the theoretical amount of the fund that would have accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The **Unfunded Actuarial Accrued Liability** is the excess of the actuarial accrued liability over the actuarial value of System assets on the valuation date.

Under this method, experience gains or losses, i.e. decreases or increases in actuarial accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

#### Asset Valuation Method

The actuarial value of assets is based on a five-year moving average of expected and actual market values determined as follows:

- at the beginning of each fiscal year, a preliminary expected actuarial asset value is calculated as the sum of the previous year’s actuarial value increased with a year’s interest at the System valuation rate plus net cash flow adjusted for interest (at the same rate) to the end of the previous fiscal year;
- the expected actuarial asset value is set equal to the preliminary expected actuarial value plus the unrecognized investment gains and losses as of the beginning of the previous fiscal year;
- the difference between the expected actuarial asset value and the market value is the investment gain or loss for the previous year;
- the (final) actuarial asset value is the preliminary value plus 20% of the investment gains and losses for each of the five previous fiscal years, but in no case more than 120% of the market value or less than 80% of the market value.



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### Amortization Method

Effective July 1, 2008, the unfunded actuarial accrued liability is amortized as a level percent of payroll over a 20-year closed period commencing July 1, 2007. For the defined contribution members, the employer sends to OPERS the difference between the OPERS required rate (16.5% for state members) and the amount required for the employer match in Pathfinder. These extra contributions to OPERS allow the use of the level percent of payroll amortization method since they are expected to produce a payment stream that is constant, if not increasing, as a percent of covered payroll.

#### Valuation Procedures

The actuarial accrued liability held for nonvested, inactive members who have a break in service, or for nonvested members who have quit or been terminated, even if a break in service has not occurred as of the valuation date, is equal to the amount of the individual's unclaimed contributions.

The wages used in the projection of benefits and liabilities are considered earnings for the year ending June 30, 2016, increased by the salary scale to develop expected earnings for the current valuation year. Earnings are annualized for new members assumed to have less than twelve months of reported earnings.

The calculations for the required employer contribution are determined as of mid-year. This is a reasonable estimate because contributions are made on a monthly basis throughout the year.

We did not value the 415 limit for active participants. The impact was assumed to be *de minimus*.

The compensation limitation under IRC Section 401(a)(17) is considered in this valuation.

Liability is included for members who appear to be deferred vested, but who have not yet submitted certain paperwork and therefore are not in the vested data provided. An estimated benefit was provided by the System. A corrected benefit and status will be provided by the System when the actual benefit and status have been finalized.

Members who are contributing to the System, but have not yet filled out an enrollment application, are included as active members. Where data elements are missing, reasonable estimates are used. Age is based on average entry age for other members. Gender is assigned in proportion to the overall group.

A liability is included for contribution amounts due to be refunded to terminated vested members who made voluntary contributions to increase the maximum compensation limit prior to July 1, 1998. The System supplied the included amounts.



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### SUMMARY OF ACTUARIAL ASSUMPTIONS

##### Economic Assumptions

**Investment Return:** 7.0% net of investment expenses per annum, compounded annually

**Salary Increases:** Sample rates below (midpoint of range shown):

<u>Nearest Age</u>	<u>% Increase</u>
20 - 24	9.50
25 - 29	7.80
30 - 34	6.30
35 - 39	5.50
40 - 44	5.20
45 - 49	4.80
50 - 54	4.50
55 - 59	4.30
60 - 64	3.80
65+	3.50

**Payroll Growth:** 3.50% per year

##### Ad hoc benefit increase assumptions

Monthly benefits No increases assumed  
Medical Supplement No increases assumed

**Projection of 401(a)(17) compensation limit:** Projected with inflation at 2.75%



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

### Oklahoma Public Employees Retirement System

#### Demographic Assumptions

##### Annual Rates of Retirement Per 100 Eligible Regular Non-Elected Members

<u>Age</u>	<u>Hired Prior to 11/1/2011</u>		<u>Hired on or After 11/1/2011</u>	
	Those Eligible For Unreduced Retirement	Those Eligible For Reduced Retirement	Those Eligible For Unreduced Retirement	Those Eligible For Reduced Retirement
50	15	N/A	N/A	N/A
51	15	N/A	N/A	N/A
52	15	N/A	N/A	N/A
53	15	N/A	N/A	N/A
54	15	N/A	N/A	N/A
55	10	3	N/A	N/A
56	10	4	N/A	N/A
57	11	4	N/A	N/A
58	12	5	N/A	N/A
59	13	6	N/A	N/A
60	14	6	30/15*	7
61	20	15	30/15*	7
62	25	N/A	30/15*	20
63	15	N/A	30/15*	15
64	15	N/A	30/15*	15
65	30	N/A	30/15*	N/A
66	25	N/A	20	N/A
67	25	N/A	20	N/A
68	25	N/A	20	N/A
69	25	N/A	25	N/A
70	100	N/A	100	N/A

\*30 when first eligible to retire and 15 thereafter



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### Demographic Assumptions (continued)

##### Annual Rates of Retirement Per 100 Eligible Elected Members

<u>Age</u>	<u>Elected Prior to 11/1/2011</u>		<u>Elected on or After 11/1/2011</u>	
	<u>Those Eligible For Unreduced Retirement</u>	<u>Those Eligible For Reduced Retirement</u>	<u>Those Eligible For Unreduced Retirement</u>	<u>Those Eligible For Reduced Retirement</u>
50	25	N/A	N/A	N/A
51	25	N/A	N/A	N/A
52	25	N/A	N/A	N/A
53	25	N/A	N/A	N/A
54	25	N/A	N/A	N/A
55	20	7.0	N/A	N/A
56	20	7.0	N/A	N/A
57	20	7.0	N/A	N/A
58	20	7.0	N/A	N/A
59	20	7.0	N/A	N/A
60	20	N/A	N/A	10
61	20	N/A	N/A	10
62	20	N/A	20	N/A
63	20	N/A	20	N/A
64	20	N/A	20	N/A
65	20	N/A	20	N/A
66	20	N/A	20	N/A
67	35	N/A	35	N/A
68	35	N/A	35	N/A
69-74	35	N/A	35	N/A
75	100	N/A	100	N/A



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

### Oklahoma Public Employees Retirement System

#### Demographic Assumptions (continued)

##### Annual Rates of Retirement Per 100 Eligible Hazardous Duty Members

<u>Hired Prior to 11/1/2011</u>				<u>Hired on or After 11/1/2011</u>			
<u>Less Than 20</u>		<u>At Least 20</u>		<u>Less Than 20</u>		<u>At Least 20</u>	
<u>Years of Service</u>		<u>Years of Service</u>		<u>Years of Service</u>		<u>Years of Service</u>	
<b>Age</b>		<b>Service*</b>		<b>Age</b>		<b>Service*</b>	
50	N/A	20	25	50	N/A	20	25
51	N/A	21	25	51	N/A	21	25
52	N/A	22	20	52	N/A	22	20
53	N/A	23-24	15	53	N/A	23-24	15
54	N/A	25-29	23	54	N/A	25-29	23
55	4	30-34	25	55	N/A	30-34	25
56	5	35+	100	56	N/A	35+	100
57	5			57	N/A		
58	5			58	N/A		
59	5			59	N/A		
60	5			60	7		
61	20			61	20		
62	40			62	20		
63	22			63	20		
64	25			64	20		
65	40			65	40		
66	25			66	25		
67	25			67	23		
68	25			68	22		
69	25			69	21		
70	100			70	100		

\*Applicable at all ages with 100% rate at age 70.



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### Demographic Assumptions (continued)

##### **Mortality Rates**

Active participants and  
nondisabled pensioners

RP-2014 Blue Collar Active/Retiree Healthy Mortality Table with base rates projected to 2025 using Scale MP-2016. For retirees, male rates are multiplied by 95% under age 70 and 105% over age 70, while female rates are multiplied by 90% and 115%. (For the multipliers, 5-year geometric smoothing is applied at age 70.)

Disabled pensioners

Nondisabled retiree mortality set forward 12 years for disabled experience.

Hazardous Duty members

For Department of Corrections officers, we assumed the mortality rate is 10% higher than the above table while the participant is active. This 10% is assumed to be in-line-of-duty.

##### **Disability Rates:**

Graduated rates

Disabled rates per 100 members

Nearest		Hazardous
<u>Age</u>	<u>Regular/Elected</u>	<u>Duty</u>
20	0.009	0.009
30	0.009	0.027
40	0.022	0.072
50	0.139	0.225
60	0.300	0.500





## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### Demographic Assumptions (continued)

##### Withdrawal Rates:

<u>Service</u>	<u>Rate</u>
0	24.00%
1	22.00%
2	18.00%
3	14.00%
4	12.00%
5	10.50%
6	9.00%
7	8.00%
8	7.00%
9	6.50%
10	6.00%
11	5.50%
12	5.00%
13	4.75%
14	4.50%
15	4.25%
16	4.00%
17	3.75%
18	3.50%
19	3.25%
20	3.00%
21	2.75%
22	2.50%
23	2.25%
24	2.00%
25	1.75%
26	1.50%
27	1.25%
28+	1.00%



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### Demographic Assumptions (continued)

##### Probability of Electing Vested Benefit:

Regular Members Only	
<u>Duration</u>	<u>Rate</u>
8	80%
13	85%
18	90%
23	95%
28	100%

##### Marital Status:

Percentage Married  
Age difference

85%  
Males are assumed to be four years older than spouses.

##### Children:

Special death benefits are provided upon the in-line-of-duty death of Department of Corrections employees who have young children. We have assumed the average age of the youngest child of such employees is nine and that 50% of such children will attend an institution of higher education to age 22.

##### Form of Payment:

Participants are assumed to elect a life-only form of payment, except elected members who receive an automatic 50% survivor benefit for an eligible spouse.



## APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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### Oklahoma Public Employees Retirement System

#### Demographic Assumptions (continued)

**Assumed age for commencement  
of deferred benefits:**

Currently active members assumed to terminate in the future prior to retirement eligibility are assumed to commence benefits at age 62 (non-elected members) or age 60 (elected members).

Currently active members hired on or after 11/1/2011 assumed to terminate in the future prior to retirement eligibility are assumed to commence benefits at age 65.

Currently inactive members with deferred benefits are assumed to commence benefits on a date provided by OPERS.

**Provision for expenses:**

Administrative expenses, as budgeted by the Oklahoma Public Employees Retirement System.



## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System Valuation Data Distribution – Actives – Regular Membership

Age	Years of Service									
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
<b>Under 25</b> Avg. Pay	915 \$24,555	13 \$29,758								928 \$24,628
<b>25 to 29</b> Avg. Pay	2,162 \$32,128	503 \$36,410	8 \$36,056							2,673 \$32,946
<b>30 to 34</b> Avg. Pay	1,743 \$34,826	1,293 \$42,055	317 \$43,054	2 \$45,794						3,355 \$38,396
<b>35 to 39</b> Avg. Pay	1,637 \$34,330	1,267 \$42,481	913 \$47,372	210 \$47,108	4 \$49,824					4,031 \$40,527
<b>40 to 44</b> Avg. Pay	1,226 \$35,052	1,062 \$41,933	847 \$45,539	656 \$50,360	143 \$50,743	3 \$43,976				3,937 \$42,292
<b>45 to 49</b> Avg. Pay	1,178 \$35,101	1,040 \$41,531	867 \$44,434	709 \$47,620	495 \$50,788	206 \$55,042	7 \$65,956			4,502 \$43,041
<b>50 to 54</b> Avg. Pay	1,020 \$34,017	904 \$40,403	808 \$44,125	646 \$46,700	565 \$48,055	650 \$53,309	188 \$57,364	26 \$51,293		4,807 \$43,887
<b>55 to 59</b> Avg. Pay	912 \$35,346	932 \$39,787	886 \$42,768	724 \$44,828	560 \$46,775	536 \$54,181	418 \$56,884	284 \$55,928	8 \$69,077	5,260 \$44,699
<b>60 to 64</b> Avg. Pay	585 \$36,392	774 \$40,318	688 \$44,280	648 \$45,466	453 \$46,350	403 \$50,219	250 \$56,804	226 \$55,545	80 \$56,043	4,107 \$45,019
<b>65 to 69</b> Avg. Pay	210 \$36,843	291 \$44,740	313 \$44,677	252 \$45,871	167 \$50,698	121 \$54,918	81 \$54,974	82 \$57,327	59 \$56,808	1,576 \$46,902
<b>70 &amp; up</b> Avg. Pay	117 \$33,598	114 \$42,932	138 \$38,669	111 \$42,025	64 \$46,494	55 \$49,077	36 \$53,936	19 \$48,876	16 \$71,936	670 \$42,571
<b>Total</b> Avg. Pay	11,705 \$33,579	8,193 \$41,176	5,785 \$44,531	3,958 \$46,764	2,451 \$48,299	1,974 \$53,062	980 \$56,754	637 \$55,573	163 \$58,520	35,846 \$41,756



## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System Valuation Data Distribution – Actives – Elected Membership

Age	Years of Service									
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
<b>Under 25</b> Avg. Pay	4 \$19,824									4 \$19,824
<b>25 to 29</b> Avg. Pay	6 \$39,399	1 \$38,400								7 \$39,256
<b>30 to 34</b> Avg. Pay	13 \$41,311	6 \$33,915	4 \$55,208							23 \$41,798
<b>35 to 39</b> Avg. Pay	8 \$38,959	12 \$49,396	10 \$46,405	6 \$53,232						36 \$46,885
<b>40 to 44</b> Avg. Pay	15 \$48,402	16 \$50,523	11 \$55,567	8 \$53,632	11 \$50,890					61 \$51,385
<b>45 to 49</b> Avg. Pay	13 \$50,909	20 \$53,774	23 \$48,605	29 \$53,735	22 \$61,649	9 \$54,574				116 \$53,974
<b>50 to 54</b> Avg. Pay	17 \$45,454	14 \$54,969	20 \$55,905	16 \$46,065	14 \$61,658	21 \$51,761	10 \$53,979			112 \$52,566
<b>55 to 59</b> Avg. Pay	16 \$50,442	35 \$44,764	18 \$56,698	18 \$50,643	16 \$52,118	14 \$54,037	15 \$63,607	5 \$50,463		137 \$51,845
<b>60 to 64</b> Avg. Pay	20 \$49,909	26 \$51,035	18 \$58,138	17 \$49,500	21 \$50,118	11 \$65,207	9 \$66,975	5 \$59,055	4 \$47,827	131 \$53,986
<b>65 to 69</b> Avg. Pay	5 \$36,690	17 \$48,242	14 \$49,695	7 \$53,247	11 \$53,787	4 \$89,448	4 \$54,016			62 \$52,219
<b>70 &amp; up</b> Avg. Pay	4 \$44,149	12 \$49,399	8 \$44,191	3 \$48,986	2 \$54,504	1 \$38,566			1 \$44,700	31 \$47,166
<b>Total</b> Avg. Pay	121 \$45,374	159 \$49,023	126 \$52,765	104 \$51,121	97 \$55,323	60 \$57,472	38 \$60,861	10 \$54,759	5 \$47,202	720 \$51,612



## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System Valuation Data Distribution – Actives – Hazardous Duty Membership

Age	Years of Service									
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
<b>Under 25</b> Avg. Pay	267 \$26,535									267 \$26,535
<b>25 to 29</b> Avg. Pay	383 \$28,546	40 \$33,768								423 \$29,040
<b>30 to 34</b> Avg. Pay	237 \$28,215	100 \$34,655	33 \$37,631							370 \$30,796
<b>35 to 39</b> Avg. Pay	116 \$29,543	71 \$34,478	83 \$38,392	25 \$42,935						295 \$34,355
<b>40 to 44</b> Avg. Pay	87 \$28,447	56 \$35,398	74 \$39,301	83 \$44,100	17 \$45,011					317 \$37,195
<b>45 to 49</b> Avg. Pay	73 \$28,795	28 \$34,328	58 \$38,883	79 \$45,219	28 \$60,888	8 \$49,970				274 \$40,129
<b>50 to 54</b> Avg. Pay	34 \$28,659	25 \$33,117	36 \$36,624	42 \$42,624	16 \$43,790	10 \$52,874	1 \$57,455			164 \$37,792
<b>55 to 59</b> Avg. Pay	29 \$30,505	20 \$34,298	17 \$36,513	24 \$41,463	20 \$41,628	5 \$50,758	3 \$44,727			118 \$37,347
<b>60 to 64</b> Avg. Pay	7 \$30,231	9 \$34,647	14 \$35,615	20 \$40,224	12 \$47,450	1 \$48,821				63 \$38,805
<b>65 to 69</b> Avg. Pay	1 \$30,211	3 \$33,575	2 \$35,425	5 \$40,355		2 \$50,562				13 \$38,822
<b>70 &amp; up</b> Avg. Pay	1 \$13,720	1 \$37,406	1 \$45,994							3 \$32,373
<b>Total</b> Avg. Pay	1,235 \$28,197	353 \$34,480	318 \$38,197	278 \$43,516	93 \$49,168	26 \$51,240	4 \$47,909			2,307 \$33,522



## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System Valuation Data Distribution – Actives – All Membership Groups

Age	Years of Service									
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
<b>Under 25</b> Avg. Pay	1,186 \$24,985	13 \$29,758								1,199 \$25,037
<b>25 to 29</b> Avg. Pay	2,551 \$31,607	544 \$36,219	8 \$36,056							3,103 \$32,427
<b>30 to 34</b> Avg. Pay	1,993 \$34,082	1,399 \$41,491	354 \$42,685	2 \$45,794						3,748 \$37,666
<b>35 to 39</b> Avg. Pay	1,761 \$34,035	1,350 \$42,121	1,006 \$46,621	241 \$46,827	4 \$49,824					4,362 \$40,162
<b>40 to 44</b> Avg. Pay	1,328 \$34,770	1,134 \$41,731	932 \$45,163	747 \$49,700	171 \$50,183	3 \$43,976				4,315 \$42,046
<b>45 to 49</b> Avg. Pay	1,264 \$34,899	1,088 \$41,571	948 \$44,195	817 \$47,605	545 \$51,745	223 \$54,841	7 \$65,956			4,892 \$43,137
<b>50 to 54</b> Avg. Pay	1,071 \$34,028	943 \$40,426	864 \$44,085	704 \$46,442	595 \$48,261	681 \$53,255	199 \$57,194	26 \$51,293		5,083 \$43,881
<b>55 to 59</b> Avg. Pay	957 \$35,452	987 \$39,852	921 \$42,925	766 \$44,859	596 \$46,746	555 \$54,146	436 \$57,032	289 \$55,834	8 \$69,077	5,515 \$44,719
<b>60 to 64</b> Avg. Pay	612 \$36,763	809 \$40,599	720 \$44,458	685 \$45,413	486 \$46,540	415 \$50,613	259 \$57,157	231 \$55,621	84 \$55,652	4,301 \$45,201
<b>65 to 69</b> Avg. Pay	216 \$36,809	311 \$44,824	329 \$44,835	264 \$45,962	178 \$50,889	127 \$55,937	85 \$54,929	82 \$57,327	59 \$56,808	1,651 \$47,038
<b>70 &amp; up</b> Avg. Pay	122 \$33,781	127 \$43,500	147 \$39,020	114 \$42,208	66 \$46,737	56 \$48,889	36 \$53,936	19 \$48,876	17 \$70,334	704 \$42,730
<b>Total</b> Avg. Pay	13,061 \$33,179	8,705 \$41,047	6,229 \$44,374	4,340 \$46,661	2,641 \$48,587	2,060 \$53,168	1,022 \$56,873	647 \$55,560	168 \$58,183	38,873 \$41,450

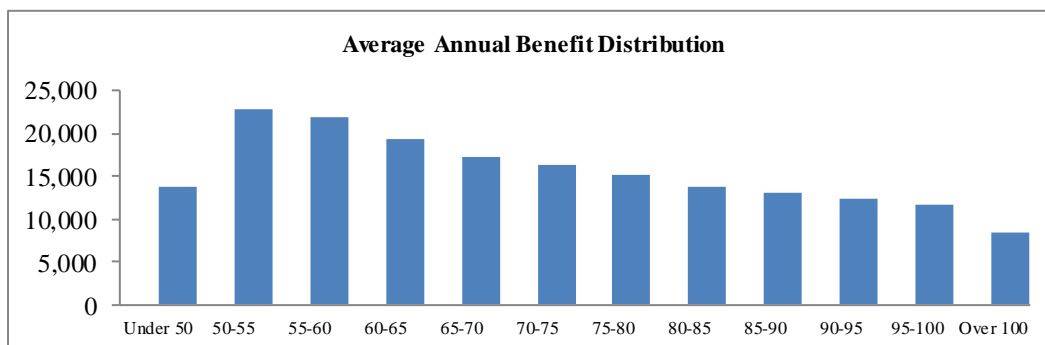
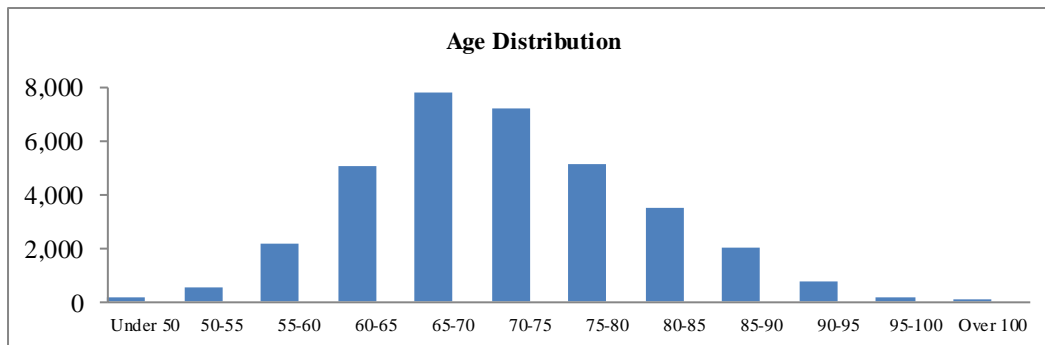


## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System

#### Valuation Data Distribution – Retired Members

Age	Number			Annual Benefits		
	Male	Female	Total	Male	Female	Total
Under 50	114	88	202	\$ 1,863,978	\$ 920,941	\$ 2,784,919
50-55	296	251	547	7,374,211	5,150,856	12,525,067
55-60	887	1,280	2,167	20,497,614	27,038,959	47,536,573
60-65	1,940	3,122	5,062	39,072,291	58,148,807	97,221,098
65-70	3,228	4,559	7,787	59,373,811	75,246,508	134,620,319
70-75	3,168	4,047	7,215	56,722,125	61,532,061	118,254,186
75-80	2,155	2,968	5,123	36,558,075	40,784,361	77,342,436
80-85	1,413	2,086	3,499	21,790,041	26,589,952	48,379,993
85-90	714	1,283	1,997	10,421,764	15,608,129	26,029,893
90-95	239	538	777	3,605,084	5,958,222	9,563,306
95-100	41	138	179	540,710	1,544,876	2,085,586
Over 100	5	19	24	41,724	162,959	204,683
Total	14,200	20,379	34,579	\$257,861,428	\$318,686,631	\$576,548,059







## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System

	Actuarial Valuation as of		% Change
	7/1/2017	7/1/2016	
1. Active members			
a. Number	38,873	41,806	(7.0%)
b. Annual compensation	\$ 1,688,543,856	\$ 1,790,809,603	(5.7%)
c. Average annual compensation	43,437	42,836	1.4%
d. Average age	46.6	46.1	1.1%
e. Average service	10.6	10.1	5.0%
2. Accumulated member contributions			
a. Active members	\$ 549,211,369	\$ 545,019,804	0.8%
b. Unclaimed contribution amounts	46,782,203	44,418,135	5.3%
c. Total	<u>\$ 595,993,572</u>	<u>\$ 589,437,939</u>	1.1%
3. Vested terminated members			
a. Number	3,039	3,032	0.2%
b. Annual deferred benefits	\$ 29,968,331	\$ 29,758,304	0.7%
c. Average annual deferred benefit	9,861	9,815	0.5%
d. Annual supplemental medical insurance premiums	\$ 3,829,140	\$ 3,820,320	0.2%
4. Assumed deferred vested - count	2,912	2,914	(0.1%)
5. Retired members			
a. Number	29,259	28,524	2.6%
b. Annual retirement benefits	\$ 519,277,463	\$ 498,444,764	4.2%
c. Average annual retirement benefit	17,748	17,475	1.6%
d. Annual supplemental medical insurance premiums	\$ 17,159,940	\$ 17,110,800	0.3%
6. Beneficiaries			
a. Number	3,860	3,731	3.5%
b. Annual retirement benefits	\$ 42,659,911	\$ 40,401,652	5.6%
c. Average annual retirement benefit	11,052	10,829	2.1%
7. Disabled members			
a. Number	1,460	1,494	(2.3%)
b. Annual retirement benefits	\$ 14,610,685	\$ 14,784,671	(1.2%)
c. Average annual retirement benefit	10,007	9,896	1.1%
d. Annual supplemental medical insurance premiums	\$ 810,180	\$ 850,500	(4.7%)
8. Total members included in valuation	79,403	81,501	(2.6%)



## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System

	Actuarial Valuation as of	
	7/1/2017	7/1/2016
<b>Regular Members</b>		
Number	35,846	38,797
Average annual compensation	\$ 41,756	\$ 41,166
Average age	47.0	46.4
Average service	10.8	10.2
<b>Elected officials</b>		
Number	720	777
Average annual compensation	\$ 51,612	\$ 51,039
Average age	53.5	53.3
Average service	14.0	13.8
<b>Hazardous Duty</b>		
Number	2,307	2,232
Average annual compensation	\$ 33,522	\$ 32,649
Average age	37.5	38.3
Average service	6.8	7.3
<b>Total</b>		
Number	38,873	41,806
Average annual compensation	\$ 41,450	\$ 40,895
Average age	46.6	46.1
Average service	10.6	10.1



## APPENDIX C – DATA

### Oklahoma Public Employees Retirement System

	Actuarial Valuation as of	
	7/1/2017	7/1/2016
<b>Retirees</b>		
Number	29,259	28,524
Average annual benefit	\$ 17,748	\$ 17,475
Average age	71.2	71.1
<b>Disability Retirees</b>		
Number	1,460	1,494
Average annual benefit	\$ 10,007	\$ 9,896
Average age	65.0	64.6
<b>Beneficiaries</b>		
Number	3,860	3,731
Average annual benefit	\$ 11,052	\$ 10,829
Average age	73.8	73.7
<b>Total</b>		
Number	34,579	33,749
Average annual benefit	\$ 16,673	\$ 16,405
Average age	71.3	71.1
<b>Vested Members</b>		
Number	5,951	5,946
Average annual benefit	\$ 9,900	\$ 9,834
Average age	52.2	52.1



## APPENDIX C – DATA

	Receiving Benefits					Total Members
	Active Members	Vested Terminated	Retirees	Disability Retirees	Benefici- aries	
<b>As of July 1, 2016</b>	<b>41,806</b>	<b>5,946</b>	<b>28,524</b>	<b>1,494</b>	<b>3,731</b>	<b>81,501</b>
Age retirements	(1,371)	(357)	1,728	0	0	0
Disability retirements	(29)	(21)	0	50	0	0
Deaths without payments continuing	(60)	(17)	(750)	(61)	(193)	(1,081)
Deaths with payments continuing	(29)	(23)	(244)	(26)	322	0
Nonvested terminations/refund of contributions	(3,976)	(130)	0	0	0	(4,106)
Vested terminations	(689)	689	0	0	0	0
Transfers	(1)	(18)	0	0	0	(19)
Data adjustments	0	22	12	4	0	38
Rehires	911	(140)	(11)	(1)	0	759
New entrants during the year	2,311	0	0	0	0	2,311
Net change	(2,933)	5	735	(34)	129	(2,098)
<b>As of July 1, 2017</b>	<b>38,873</b>	<b>5,951</b>	<b>29,259</b>	<b>1,460</b>	<b>3,860</b>	<b>79,403</b>

	Active	Retired	Terminated Vested	Total
Records submitted on data file	38,550	60,147	3,042	101,739
Remove deceased retirees	0	(25,557)	0	(25,557)
Remove unusable data	(25)	0	0	(25)
Remove those with another status	(10)	(11)	(3)	(24)
Add those with no application	358	0	0	358
Add assumed vesteds	0	0	2,912	2,912
<b>Total valued</b>	<b>38,873</b>	<b>34,579</b>	<b>5,951</b>	<b>79,403</b>



## APPENDIX D - GLOSSARY

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### Oklahoma Public Employees Retirement System

#### **Accrued Benefit**

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

#### **Actuarial Accrued Liability**

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

#### **Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

#### **Actuarial Cost Method**

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

#### **Actuarial Gain (Loss)**

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

#### **Actuarial Present Value**

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

#### **Actuarial Valuation**

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

#### **Actuarial Value of Assets**

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

#### **Actuarially Equivalent**

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

#### **Amortization Payment**

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.



## **APPENDIX D - GLOSSARY**

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### **Deferred Vested Participant**

A vested member who has terminated employment prior to early or normal retirement age who does not withdraw his or her contributions and is, therefore, due a retirement benefit at a later date.

### **Entry Age Actuarial Cost Method**

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

### **Market Value of Assets**

The fair value of cash, investments and other property belonging to a pension plan that could be acquired by exchanging them on the open market.

### **Normal Cost**

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method Projected Benefits

### **Projected Benefits**

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

### **Unaccrued Benefit**

The excess of an individual's Projected Benefits over the Accrued Benefits as of a specified date.

### **Unfunded Actuarial Accrued Liability**

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

### **Withdrawal Liability**

The liability due to an active member terminating employment with a deferred vested benefit.