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OKLAHOMA PUBLIC EMPLOYEES RETIREMENT SYSTEM

State of Oklahoma
Public Employees Retirement System

Actuarial Valuation Report
as of July 1, 2016

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October 12, 2016

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, 2016.

The purpose of this report is to provide a summary of the funded status of the System as of July 1, 2016 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 4.00% annually.

Since the previous valuation, the investment return assumption has been lowered from 7.50% net of investment expenses, compounded annually to 7.25%.

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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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,

Alisa Bennett, FSA, EA, FCA, MAAA	Brent Banister, PhD, FSA, EA, FCA, MAAA
Principal and Consulting Actuary	Chief Pension Actuary

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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, 2016 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.

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.

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 an impact of the valuation results in this report, the impact is small since it only concerns employees hired between November 1, 2015 and June 30, 2016. 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 the difference between the defined contribution plan match and the statutory rate for the System. This is expected to provide at least as much toward the UAAL as would have been expected otherwise, so we are comfortable with continuing the methodology of amortizing as a level percentage of payroll. 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, 2016. The unfunded actuarial accrued liability for the System increased by $61.1 million due to various factors. A detailed analysis of the change in the unfunded actuarial accrued liability from July 1, 2015 to July 1, 2016 is shown on page 5.

The highlights of the valuation are shown below:

	Actuarial Valuation Date	
Funded Status $(millions)	**July 1, 2016**	**July 1, 2015**
Actuarial Accrued Liability	$9,428	$8,996
Actuarial Value of Assets	$8,791	$8,420
Unfunded Actuarial Accrued Liability	$ 637	$ 576
Funded Ratio (Actuarial Value)	93.2%	93.6%
Market Value of Assets	$8,436	$8,636
Funded Ratio (Market Value)	89.5%	96.0%

There was a liability gain of $52.7 million from demographic experience which resulted in an actuarial accrued liability that was lower than expected (0.56% 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 0.18% for the year ended June 30, 2016. 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 7.06% which resulted in an actuarial loss of $36.3 million.

Since the previous valuation, the investment return assumption has been lowered from 7.50% net of investment expenses, compounded annually to 7.25%. This results in an increase to the actuarial accrued liability of $233.9 million.

The actuarial contribution rate for the employers increased from 2015 to 2016:

	Actuarial Valuation Date	
Contribution Rate	**July 1, 2016**	**July 1, 2015**
Normal Cost	10.01%	9.52%
Amortization of UAAL*	3.79%	3.28%
Budgeted Expenses	0.37%	0.37%
Actuarially Determined Contribution Rate	14.17%	13.17%
Less Estimated Member Contribution Rate	4.10%	4.07%
Employer Actuarially Determined Contribution Rate	10.07%	9.10%
Less Employer Statutory Contribution Rate	16.50%	16.50%
Contribution Shortfall (Surplus)	(6.43%)	(7.40%)

*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.

The normal cost is expected to increase as a percentage of active payroll over time since the plan is closed to most new employees hired after November 1, 2015. New hazardous duty employees will continue to be members of the defined benefit plan and the hazardous duty employees have a higher normal cost than regular employees. Additional funding implications of the plan being partially closed will be considered in the next experience study of the plan.

EXPERIENCE: July 1, 2015 to July 1, 2016

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, 2016. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System; liabilities 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, 2015 and July 1, 2016. Each component is examined in the following discussion.

ASSETS

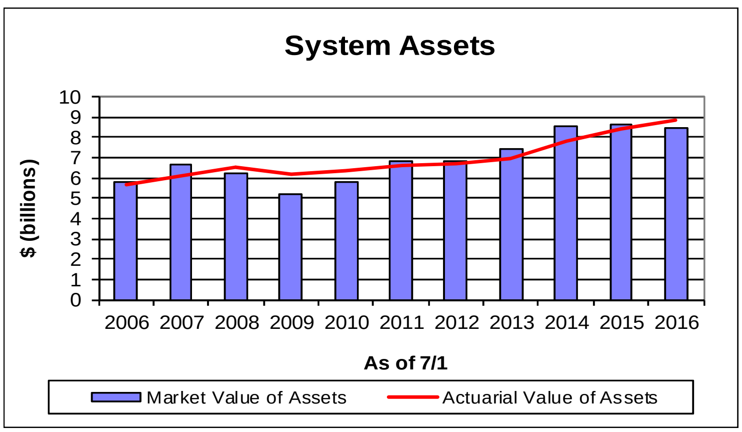
As of July 1, 2016, the System had total funds of $8.44 billion when measured on a market value basis. This was a decrease of $200 million from the July 1, 2015 figure of $8.64 billion. The market value of assets is not used directly in the calculation of the actuarial contribution rate. An asset valuation 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, 2016.

The actuarial value of assets as of July 1, 2016 was $8.79 billion. The annualized dollar-weighted rate of return for fiscal year 2016, measured on the actuarial value of assets, was approximately 7.06%, which resulted in an actuarial loss of $36.3 million. Measured on the market value of assets, the estimated rate of return was 0.18%, net of investment expenses.

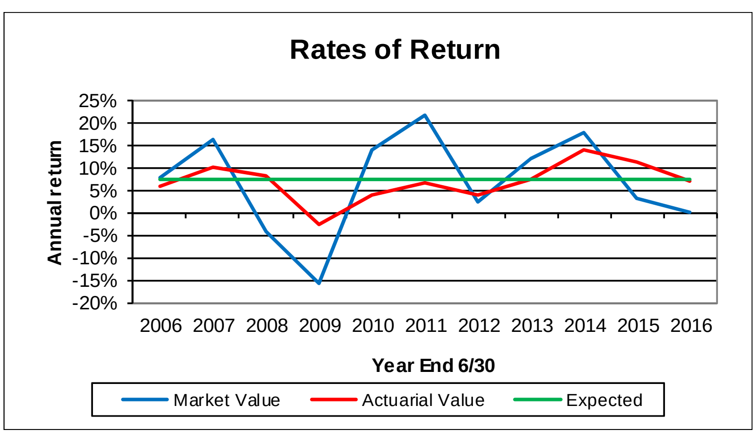
The components of the change in the market and actuarial value of assets for the System are set forth below:

	Market Value $(millions)	Actuarial Value $(millions)
Net Assets, July 1, 2015	$8,636	$8,420
• Employer and Member Contributions	370	370
• Benefit Payments and Expenses	(586)	(586)
• Investment Income/(Loss)	16	587
Preliminary Value, July 1, 2016	8,436	8,791
Application of Corridor	N/A	N/A
Final Net Assets, July 1, 2016	$8,436	$8,791
Estimated Rate of Return	0.18%	7.06%

Due to the use of an asset smoothing method, there is approximately $355 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 market value of assets has been higher than the actuarial value. However, due to unfavorable investment experience over the most recent fiscal years, the market value as of July 1, 2016 is lower than the actuarial value.



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.

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, 2016 is:

Actuarial Accrued Liability	$9,427,809,623
Actuarial Value of Assets	8,790,886,036
Unfunded Actuarial Accrued Liability	$ 636,923,587

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 investment return assumption was lowered from 7.50% to 7.25%. The actual experience measured in this valuation is that which occurred during the plan year ended June 30, 2016. There was an experience loss on the actuarial value of assets related to the low investment return and an experience gain on liabilities, primarily as a result of salary increases that were not as large as anticipated. The net result was an increase in the UAAL.

Between July 1, 2015 and July 1, 2016 the change in the unfunded actuarial accrued liability for the System was as follows (in millions):

	$(millions)
Unfunded Actuarial Accrued Liability, July 1, 2015	$576
• effect of contributions more than actuarial rate	(132)
• expected decrease due to amortization	(18)
• investment experience	36
• liability experience[1]	(53)
• other experience	(6)
• change in actuarial assumptions	234
• change due to amendments	0
Unfunded Actuarial Accrued Liability, July 1, 2016	$ 637

[1] Liability gain is about 0.56% of total expected actuarial accrued liability

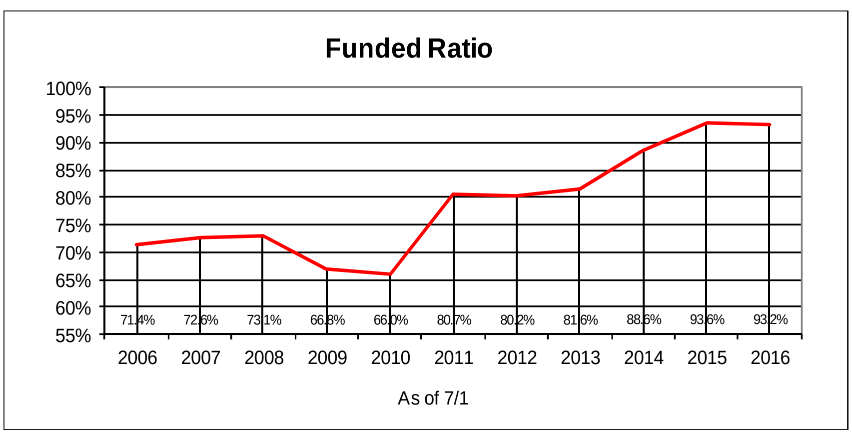
The liability gain for the System can be allocated to actual experience related to each actuarial assumption as follows:

Liability Source	Impact of AAL $(millions)	% of Expected Liability
Salary Increases	$(42.8)	(0.45)%
Mortality	(13.6)	(0.14)%
Termination of Employment	(4.3)	(0.05)%
Retirements	2.3	0.02%
Disability	2.2	0.02%
New Entrants and Rehires	23.0	0.24%
Miscellaneous/Data Changes	(19.5)	(0.20)%
Total (Gain)/Loss	$ (52.7)	(0.56)%

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. 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. The funded status information, on both an actuarial and market value basis, is shown below in $(millions).

	7/1/11	7/1/12	7/1/13	7/1/14	7/1/15	7/1/16
Using Actuarial Value of Assets:						
Funded Ratio	80.7%	80.2%	81.6%	88.6%	93.6%	93.2%
Unfunded Actuarial Accrued Liability (UAAL)	$1,581	$1,652	$1,577	$ 994	$ 576	$ 637
Using Market Value of Assets:						
Funded Ratio	83.6%	81.8%	87.0%	97.9%	96.0%	89.5%
Unfunded Actuarial Accrued Liability (UAAL)	$1,339	$1,513	$1,114	$ 184	$ 360	$ 992



Through the first part of this period, the funded ratio steadily declined. 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). The decrease in 2016 is due to the asset loss and the lowering of the assumed investment rate.

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.

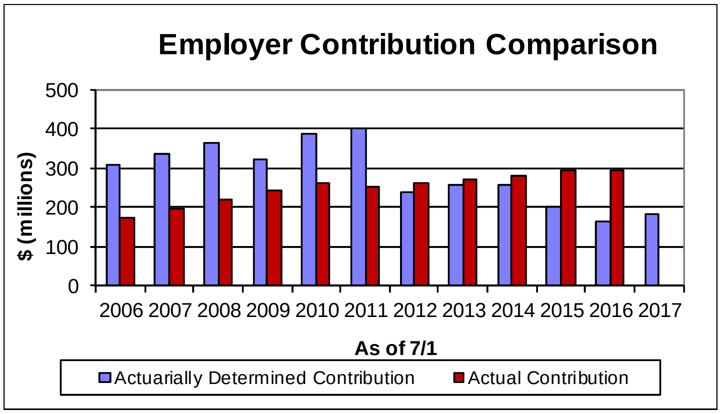
Contributions to the System are made by the members and their employers. Most State employees pay 3.5% of compensation. Local government employees contribute from 3.5% to 8.5% of compensation, depending on the rate chosen by their employer. Starting in 2004, most members were eligible to make an election 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 member 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 now greater than the employer actuarial contribution rate for fiscal year 2016 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, 2016 valuation, if the System receives the statutory rate and the expected employer contributions on behalf of the defined contribution participant payroll and all assumptions are met, it is projected the UAAL will be paid off within the next five years, even though 11 years remain in the amortization period.

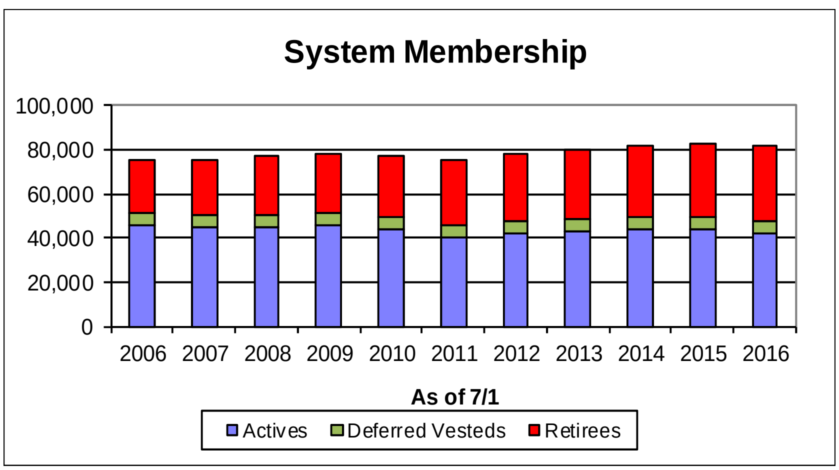
The following graph shows the total actuarially determined employer contribution compared to the amount actually received in each year. The funding policy contribution equals the System's normal cost, budgeted expenses, and an amortization of the unfunded actuarial accrued liability. For July 1, 1998 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, 2016, 11 years remain in the amortization period.



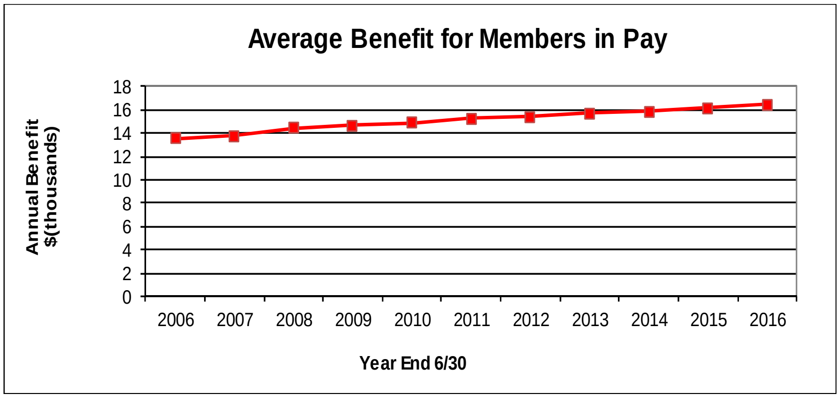
MEMBER INFORMATION

The number of active members included in the valuation decreased by 0.2% from the 2014 to the 2015 valuation and then decreased by 4.6% from the 2015 to the 2016 valuation. This is a significant demographic change resulting from the closure of the plan to most new employees hired after November 1, 2015.

Retired member counts and average retirement benefit amounts continue to increase steadily. There were 33,749 retirees and beneficiaries in the 2016 valuation, with an average benefit of $1,367 per month. This represents about 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.



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

The current valuation as of July 1, 2016 reflects a market value loss for 2016. Together with the gains in 2013 and 2014, and the loss in 2015, the 2016 valuation recognizes a $36 million overall loss in the actuarial value of assets with $355 million expected to be recognized in future years. The asset smoothing mechanism will offset the losses expected to be recognized in future years with gains in market value in the future, should they occur.

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 4.00% 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, 2016 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.

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

	7/1/2016 Valuation	7/1/2015 Valuation	% Change
1. PARTICIPANT DATA			
Number of:			
Active Members	41,806	43,843	(4.6)
Retired and Disabled Members and Beneficiaries	33,749	32,754	3.0
Inactive Members	5,946	5,863	1.4
Total Members	81,501	82,460	(1.2)
Projected Annual Salaries of Active Members	$ 1,790,809,603	$ 1,808,972,785	(1.0)
Annual Retirement Payments for Retired Members and Beneficiaries	$ 553,631,087	$ 528,779,908	4.7
2. ASSETS AND LIABILITIES			
Total Actuarial Accrued Liability	$ 9,427,809,623	$ 8,996,125,901	4.8
Market Value of Assets	$ 8,435,578,907	$ 8,636,441,984	(2.3)
Actuarial Value of Assets	$ 8,790,886,036	$ 8,420,306,645	4.4
Unfunded Actuarial Accrued Liability	$ 636,923,587	$ 575,819,256	10.6
Funded Ratio	93.2%	93.6%	(0.4)
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost Rate	10.01%	9.52%	
Amortization of Unfunded Actuarial Accrued Liability	3.79%	3.28%	
Budgeted Expenses	0.37%	0.37%	
Total Actuarially Determined Contribution Rate	14.17%	13.17%	
Less Estimated Member Contribution Rate	4.10%	4.07%	
Employer Actuarially Determined Contribution Rate	10.07%	9.10%	
Less Statutory State Employer Contribution Rate	16.50%	16.50%	
Contribution Shortfall/(Surplus)	(6.43%)	(7.40%)	

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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, 2016, the market value of assets for the System was $8.4 billion. Table 1 is a comparison, at market values, of System assets as of June 30, 2016, and June 30, 2015, in total and by investment category. Table 2 summarizes the change in the market value of assets from July 1, 2015 to June 30, 2016.

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. A technique which dampens swings in the market value while still indirectly recognizing market values is used for determining the actuarial value of assets.

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 as of the valuation date.

Oklahoma Public Employees Retirement System

Table 1

Analysis of Net Assets at Market Value

	June 30, 2016		June 30, 2015	
	Amount $(millions)	% of Total	Amount $(millions)	% of Total
Cash & Equivalents	$ 120.7	1.4%	$ 197.0	2.2%
Short-term Investments	32.1	0.4%	29.3	0.3%
Government Obligations	1,932.2	22.5%	1,695.5	19.2%
Corporate Bonds	858.7	10.0%	979.6	11.0%
Domestic Equity	3,767.2	44.0%	3,958.4	44.6%
International Equity	1,846.8	21.5%	2,010.5	22.7%
Real Estate	12.9	0.2%	0.0	0.0%
Subtotal	$ 8,570.6	100.0%	$ 8,870.3	100.0%
Property (net)	0.5		0.7	
Other Assets	0.3		0.3	
Net Receivables/(Payables)	(135.8)		(234.9)	
Net Assets	$ 8,435.6		$ 8,636.4	

Oklahoma Public Employees Retirement System

Table 2

Statement of Changes in Net Assets

	Fiscal Year Ended June 30			
		2016		2015*
1. Market Value of Net Assets at Beginning of Year	$	8,636,441,984	$	8,570,104,910
2. Contributions				
a. Members	$	73,800,890	$	73,145,380
b. State and local agencies		296,249,191		292,184,940
c. Total contributions (2a) + (2b)	$	370,050,081	$	365,330,320
3. Net Investment Income				
a. Net appreciation (depreciation) in fair value of investments	$	(106,650,476)	$	156,381,398
b. Interest		69,420,254		62,422,223
c. Dividends		58,215,187		54,767,671
d. Securities lending activities		2,098,331		2,419,506
e. Real Estate		532,069		0
f. Total investment income/(loss) (3a) + (3b) + (3c) + (3d) + (3e)	$	23,615,365	$	275,990,798
g. Investment expenses		(7,858,841)		(11,701,684)
h. Net investment income/(loss) (3f) + (3g)	$	15,756,524	$	264,289,114
i. Total additions/(subtractions) (2c) + (3h)	$	385,806,605	$	629,619,434
4. Deductions				
a. Retirement, death, and survivor benefits	$	565,412,267	$	542,488,709
b. Refunds and withdrawals		15,862,423		15,610,803
c. Administrative expenses		5,394,992		5,182,848
d. Total deductions (4a) + (4b) + (4c)	$	586,669,682	$	563,282,360
5. Net Change in Assets (3i) - (4d)	$	(200,863,077)	$	66,337,074
6. Market Value of Net Assets at End of Year* (1) + (5)	$	8,435,578,907	$	8,636,441,984

*****Several numbers have been adjusted by small amounts since the previous valuation to match the June 30, 2016 statements of changes in plan net position.*

Oklahoma Public Employees Retirement System

Table 3

Determination of Actuarial Value of Assets

1. Market Value as of July 1, 2015	$	8,636,441,984
2. Contributions		
a. Member	$	73,800,890
b. Employer		296,249,191
c. Total (a) + (b)	$	370,050,081
3. Decreases During Year		
a. Benefit payments	$	(565,412,267)
b. Refunds and withdrawals		(15,862,423)
c. Administrative expenses		(5,394,992)
d. Total (a) + (b) + (c)	$	(586,669,682)
4. Expected Return on Assets at 7.5%	$	639,756,767
5. Expected Market Value as of June 30, 2016 (1) + (2c) + (3d) + (4)	$	9,059,579,150
6. Actual Market Value as of June 30, 2016	$	8,435,578,907
7. Year End 2016 Asset Gain/(Loss) (6) - (5)	$	(624,000,243)

Schedule of Asset Gains/(Losses)

Year End		Original Amount		Recognized in Prior Years		Recognized in This Year		Recognized in Future Years
2012	$	(333,783,235)	$	(267,026,588)	$	(66,756,647)	$	0
2013		299,344,147		179,606,488		59,868,829		59,868,830
2014		766,830,212		306,732,084		153,366,042		306,732,086
2015		(371,179,751)		(74,235,950)		(74,235,950)		(222,707,851)
2016		(624,000,243)		0		(124,800,049)		(499,200,194)
Total	$	(262,788,870)	$	145,076,034	$	(52,557,775)	$	(355,307,129)

8. Asset Gain/(Loss) to be Recognized in the Future	$	(355,307,129)
9. Initial Actuarial Value as of June 30, 2016 (6) - (8)	$	8,790,886,036
10. Constraining Values:		
a. 80% of market value (6) x 0.8	$	6,748,463,126
b. 120% of market value (6) x 1.2	$	10,122,694,688
11. Actuarial Value as of June 30, 2016	$	8,790,886,036
(9), but not less than (10a), nor greater than (10b)		

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, 2013. This set of assumptions is shown in Appendix B. The liabilities reflect the benefit structure in place as of July 1, 2016.

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.

Oklahoma Public Employees Retirement System

Table 4

Present Value of Future Benefits
As of July 1, 2016

	Regular	Elected Officials	Hazardous Duty	Total
1. Active Employees				
a. Retirement Benefit	$ 3,867,897,624	$ 216,196,881	$ 201,268,239	$ 4,285,362,744
b. Withdrawal Benefit	176,715,104	7,604,335	8,323,667	192,643,106
c. Pre-Retirement Death Benefit	121,313,905	3,446,494	3,382,943	128,143,342
d. Disability Benefit	118,248,605	5,332,151	3,372,672	126,953,428
e. Return of Member Contributions	50,775,949	554,888	4,626,201	55,957,038
f. Supplemental Medical Benefit	164,742,693	4,862,727	9,143,378	178,748,798
g. Subtotal	$ 4,499,693,880	$ 237,997,476	$ 230,117,100	$ 4,967,808,456
2. Inactive Nonvested Members				$ 44,418,135
3. Inactive Vested Members				350,358,853
4. Return of Excess Contributions				459,840
5. Disabled Members				111,037,217
6. Retirees				4,740,373,583
7. Beneficiaries				322,248,755
8. Supplemental Medical Benefit for Retirees				188,122,883
9. Total Inactive Liability Sum of (2) through (8)				$ 5,757,019,266
10. Total PVFB (1g) + (9)				$ 10,724,827,722

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	$	3,867,897,624	$	216,196,881	$	201,268,239	$	4,285,362,744
b. Withdrawal Benefit		176,715,104		7,604,335		8,323,667		192,643,106
c. Pre-Retirement Death Benefit		121,313,905		3,446,494		3,382,943		128,143,342
d. Disability Benefit		118,248,605		5,332,151		3,372,672		126,953,428
e. Return of Member Contributions		50,775,949		554,888		4,626,201		55,957,038
f. Supplemental Medical Benefit		164,742,693		4,862,727		9,143,378		178,748,798
g. Subtotal	$	4,499,693,880	$	237,997,476	$	230,117,100	$	4,967,808,456
2. Present Value of Future Normal Costs for Active Members								
a. Retirement Benefit	$	833,298,692	$	29,979,761	$	55,863,206	$	919,141,659
b. Withdrawal Benefit		109,824,662		5,562,955		4,872,552		120,260,169
c. Pre-Retirement Death Benefit		31,828,025		585,692		1,035,029		33,448,746
d. Disability Benefit		43,511,098		1,379,787		1,240,262		46,131,147
e. Return of Member Contributions		118,296,856		3,378,755		10,035,616		131,711,227
f. Supplemental Medical Benefit		42,514,363		1,178,067		2,632,721		46,325,151
g. Subtotal	$	1,179,273,696	$	42,065,017	$	75,679,386	$	1,297,018,099
3. Present Value of Future Benefits for Inactive Members (Table 4)							$	5,757,019,266
4. Total Actuarial Accrued Liability (1g) - (2g) + (3)							$	9,427,809,623

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 11 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 the defined contribution members, the employer sends to OPERS the difference between the OPERS statutorily required rate (16.5% for state members) and the amount required for the employer match in the defined contribution plan. 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.

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	$ 113,760,069	$ 5,430,929	$ 8,051,577	$ 127,242,575	7.10%
b. Withdrawal Benefit	13,960,566	932,291	724,056	15,616,913	0.87%
c. Pre-Retirement Death Benefit	4,162,785	104,551	161,579	4,428,915	0.25%
d. Disability Benefit	5,267,461	219,906	185,306	5,672,673	0.32%
e. Return of Member Contributions	15,914,796	623,349	1,492,431	18,030,576	1.01%
f. Supplemental Medical Benefit	7,580,357	255,184	420,481	8,256,022	0.46%
g. Total	$ 160,646,034	$ 7,566,210	$ 11,035,430	$ 179,247,674	10.01%
2. Estimated Payroll for the Year	$ 1,673,190,819	$ 41,501,406	$ 76,117,378	$ 1,790,809,603	
3. Normal Cost Rate (1g)/(2)	9.60%	18.23%	14.50%	10.01%	

Oklahoma Public Employees Retirement System

Table 7

Unfunded Actuarial Accrued Liability Contribution Rate

1. Actuarial Present Value of Future Benefits	$	10,724,827,722
2. Actuarial Present Value of Future Normal Costs		1,297,018,099
3. Actuarial Accrued Liability (1) - (2)	$	9,427,809,623
4. Actuarial Value of Assets		8,790,886,036
5. Unfunded Actuarial Accrued Liability (UAAL) (3) - (4)	$	636,923,587
6. Amortization of UAAL over 20 years from July 1, 2007 (assumed mid-year) *	$	69,607,963
7. Total Estimated Payroll for Year Ending June 30, 2017**	$	1,837,169,793
8. Amortization as a Percent of Payroll		3.79%

*The UAAL is amortized as a level percent of payroll, assuming payroll increases 4.0% per year.
**Includes $46,360,190 in projected payroll for the defined contribution plan participants since employer contributions toward the defined benefit plan UAAL will be made on this payroll.

Oklahoma Public Employees Retirement System

Table 8

Actuarial Contribution Rate

	July 1	
	2016	2015
1. Total Normal Cost Rate	10.01%	9.52%
2. Amortization of UAAL[1]	3.79%	3.28%
3. Budgeted Expenses[2]	0.37%	0.37%
4. Total Actuarial Contribution Rate (1) + (2) + (3)	14.17%	13.17%
5. Estimated Member Contribution Rate	4.10%	4.07%
6. Employer Actuarial Contribution Rate (4) - (5)	10.07%	9.10%

[1] Amortization of UAAL is a level percent of payroll. Recognizes contributions received on behalf of defined contribution plan members.

[2] Provided by the System.

Oklahoma Public Employees Retirement System

Table 9

Calculation of Actuarial Gain/(Loss)

1. Expected Actuarial Accrued Liability		
a. Actuarial accrued liability at July 1, 2015	$	8,996,125,901
b. Normal cost at mid-year		172,182,634
c. Benefit payments for fiscal year ending June 30, 2016		(581,274,690)
d. Interest on (a), (b), and (c)		659,645,827
e. Change in assumptions		233,874,340
f. Amendments		0
g. Expected actuarial accrued liability as of July 1, 2016 (a) + (b) + (c) + (d) + (e) + (f)	$	9,480,554,012
2. Actuarial Accrued Liability at July 1, 2016	$	9,427,809,623
3. Actuarial Accrued Liability Gain/(Loss) (1g) - (2)	$	52,744,389
4. Expected Actuarial Value of Assets		
a. Actuarial value of assets at July 1, 2015	$	8,420,306,645
b. Contributions for fiscal year ending June 30, 2016		370,050,081
c. Benefit payment and administrative expenses for fiscal year ending June 30, 2016		(586,669,682)
d. Interest on (a), (b), and (c)		623,546,617
e. Expected actuarial value of assets as of July 1, 2016 (a) + (b) + (c) + (d)	$	8,827,233,661
5. Actuarial Value of Assets at July 1, 2016	$	8,790,886,036
6. Actuarial Value of Assets Gain/(Loss) (5) - (4e)	$	(36,347,625)
7. Net Actuarial Gain/(Loss) (3) + (6)	$	16,396,764

Oklahoma Public Employees Retirement System

Table 10

Summary of Contribution Requirements

	Actuarial Valuation as of				Percent
		July 1, 2016		July 1, 2015	Change
1. Expected Annual Payroll	$	1,790,809,603	$	1,808,972,785	(1.0%)
2. Total Normal Cost	$	179,247,674	$	172,182,634	4.1%
3. Unfunded Actuarial Accrued Liability	$	636,923,587	$	575,819,256	10.6%
4. Amortization of Unfunded Actuarial Accrued Liability over 20 Years from July 1, 2007*	$	69,607,963	$	59,298,135	17.4%
5. Budgeted Expenses (Provided by the System)	$	6,681,099	$	6,754,262	(1.1%)
6. Total Required Contribution (2) + (4) + (5)	$	255,536,736	$	238,235,031	7.3%
7. Estimated Member Contributions	$	73,433,064	$	73,634,671	(0.3%)
8. Required Employer Contribution (6) - (7)	$	182,103,672	$	164,600,360	10.6%
9. Previous Year's Actual Contribution					
a. Member	$	73,800,890	$	73,145,380	0.9%
b. Employer		296,249,191		292,184,940	1.4%
c. Total	$	370,050,081	$	365,330,320	1.3%

*Amortization of UAAL is a level percent of payroll.

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.

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%

*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.

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 fund needed to settle liabilities.

	July 1			
		2016		2015
Vested benefits				
Active members	$	2,072,766,675	$	2,022,830,941
Terminated vested members		350,358,853		329,091,958
Unclaimed contributions		44,418,135		40,683,862
Limited benefit		459,840		536,467
Retirees and beneficiaries		5,173,659,555		4,864,693,645
Supplemental medical insurance premiums		323,142,549		316,845,583
Total vested benefits	$	7,964,805,607	$	7,574,682,456
Nonvested benefits for active members	$	257,012,732	$	263,643,929
Total accumulated benefits	$	8,221,818,339	$	7,838,326,385
Market value of assets available for benefits	$	8,435,578,907	$	8,636,441,984
Funded ratio		102.6%		110.2%
Number of members				
Vested members				
Active members		19,881		20,304
Terminated vested members		5,946		5,863
Retirees and beneficiaries		33,749		32,754
Total vested members		59,576		58,921
Nonvested active members		21,925		23,539
Total members		81,501		82,460

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, 2015	$	7,838,326,385
Increase/(decrease) during the year attributable to:		
Benefits accrued and (gains)/losses		398,295,901
Increase due to interest		566,470,743
Benefits paid		(581,274,690)
Plan provision change		0
Net increase/(decrease)	$	383,491,954
Present value of accrued benefit as of July 1, 2016	$	8,221,818,339

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, 2016. The "Retirees" column shows benefits expected to be paid to members receiving benefit payments as of July 1, 2016 or to members who have terminated employment and are entitled to a deferred vested benefit.

Retirement, Survivor and Withdrawal Benefits

Year Ending June 30	Actives	Retirees	Total
2017	$ 38,663,000	$ 557,224,000	$ 595,887,000
2018	71,772,000	548,123,000	619,895,000
2019	103,954,000	538,705,000	642,659,000
2020	135,848,000	528,681,000	664,529,000
2021	166,766,000	517,881,000	684,647,000
2022	196,778,000	506,759,000	703,537,000
2023	225,881,000	494,995,000	720,876,000
2024	253,565,000	482,952,000	736,517,000
2025	281,460,000	470,534,000	751,994,000
2026	308,556,000	457,248,000	765,804,000

Supplemental Medical Premium Benefits

Year Ending June 30	Actives	Retirees	Total
2017	$ 1,640,000	$ 18,235,000	$ 19,875,000
2018	3,467,000	17,933,000	21,400,000
2019	5,204,000	17,657,000	22,861,000
2020	6,867,000	17,356,000	24,223,000
2021	8,419,000	17,038,000	25,457,000
2022	9,881,000	16,694,000	26,575,000
2023	11,216,000	16,352,000	27,568,000
2024	12,425,000	16,023,000	28,448,000
2025	13,539,000	15,705,000	29,244,000
2026	14,572,000	15,346,000	29,918,000

Oklahoma Public Employees Retirement System

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

Effective date and fiscal year

The System became effective January 1, 1964. The fiscal year is July 1 to June 30.

Administration

The System is administered by a 13-member Oklahoma Public Employees Retirement System Board of Trustees. The Board acts as the fiduciary for the investment and administration of the System.

Employees included

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:

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

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).

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.

Employer and employee contributions

Most State employees except Hazardous Duty employees and most elected officials:

Employee:	3.5%
Employer:	16.5%
Total:	20.0%

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

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.

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:

Member Accumulation			Additional Years
$ 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.

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.

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^{nd} 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.

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:

% of Compensation Contributed	% of Highest Annual Compensation
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.

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:

Elected Officials		Other Members	
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:

Elected Officials		Other Members	
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

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.

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.

Oklahoma Public Employees Retirement System

Optional form of retirement benefits

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:

Option A – Joint and 50% Survivor Annuity with a return to the unreduced amount if the joint annuitant dies.

Option B – Joint and 100% Survivor Annuity with a return to the unreduced amount if the joint annuitant dies.

Option C – Life Annuity with a minimum of 120 monthly payments.

For married members, spousal consent is required for any option other than Option A, or a joint annuitant other than the spouse.

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.

Post-retirement medical benefit

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.

Expenses

The expenses of administering the System are paid from the retirement trust fund.

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 62nd 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).

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:

Year	Up to $25,000	Above $25,000
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 Service	Service Beyond 20 Years	
		Up to $25,000	Above $25,000
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.

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.

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, 2015, increased by the salary scale to develop expected earnings for the current valuation year. Earnings are annualized for members with 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.

Oklahoma Public Employees Retirement System

SUMMARY OF ACTUARIAL ASSUMPTIONS

Economic Assumptions

Investment Return: 7.25% net of investment expenses per annum, compounded annually

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

Nearest Age	% Increase
20 - 24	8.40
25 - 29	7.40
30 – 34	6.10
35 – 39	5.50
40 – 44	5.20
45 – 49	4.80
50 – 54	4.50
55 – 59	4.50
60 – 64	4.50
65+	4.50

Payroll Growth: 4.00% per year

Ad hoc benefit increase assumptions:

Monthly Benefits: 0% (HB 2132)

Medical Supplement: No increases assumed

Projection of 401(a)(17) compensation limit: Projected with inflation at 3.0%

Oklahoma Public Employees Retirement System

Demographic Assumptions

Retirement age

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

	Hired Prior to 11/1/2011		Hired on or After 11/1/2011	
Age	Those Eligible For Unreduced Retirement	Those Eligible For Reduced Retirement	Those Eligible For Unreduced Retirement	Those Eligible For Reduced Retirement
50	20	N/A	N/A	N/A
51	20	N/A	N/A	N/A
52	20	N/A	N/A	N/A
53	20	N/A	N/A	N/A
54	20	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	*	7
61	20	15	*	7
62	30	N/A	*	20
63	15	N/A	*	15
64	15	N/A	*	15
65	30	N/A	*	N/A
66	20	N/A	20	N/A
67	20	N/A	20	N/A
68	20	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

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Oklahoma Public Employees Retirement System

Demographic Assumptions (continued)

Retirement age (continued):

Annual Rates of Retirement Per 100 Eligible Elected Members

	Elected Prior to 11/1/2011		Elected on or After 11/1/2011	
Age	Those Eligible For Unreduced Retirement	Those Eligible For Reduced Retirement	Those Eligible For Unreduced Retirement	Those Eligible For Reduced Retirement
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	7.5	N/A	N/A
56	20	7.5	N/A	N/A
57	20	7.5	N/A	N/A
58	20	7.5	N/A	N/A
59	20	7.5	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

Oklahoma Public Employees Retirement System

Demographic Assumptions (continued)

Retirement age (continued):

Annual Rates of Retirement Per 100 Eligible Hazardous Duty Members

Hired Prior to 11/1/2011				Hired on or After 11/1/2011			
	Less Than 20 Years of Service		At Least 20 Years of Service		Less Than 20 Years of Service		At Least 20 Years of Service
Age		**Service**		**Age**		**Service**	
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	6			58	N/A		
59	7			59	N/A		
60	7			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	23			67	23		
68	22			68	22		
69	21			69	21		
70	100			70	100		

Oklahoma Public Employees Retirement System

Demographic Assumptions (continued)

Mortality Rates:

Active participants and nondisabled pensioners	RP-2000 Combined Active/Retiree Healthy Mortality Table projected to 2010 using Scale AA.
Disabled pensioners	RP-2000 Combined Active/Retiree Healthy Mortality Table projected to 2010 using Scale AA set forward 15 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 Age	Male	Female
20	0.009	0.009
30	0.027	0.027
40	0.072	0.090
50	0.225	0.261
60	0.500	0.350

Oklahoma Public Employees Retirement System

Withdrawal Rates:

Service	Rate
1	22.0%
2	18.0%
3	14.0%
4	12.0%
5	10.5%
6	9.0%
7	8.0%
8	7.0%
9	6.5%
10	6.0%
11	5.3%
12	4.5%
13	4.0%
14	3.5%
15	3.1%
16	2.8%
17	2.6%
18	2.4%
19	2.2%
20	2.0%
21	1.8%
22	1.6%
23	1.4%
24	1.2%
25+	1.0%

Probability of Electing Vested Benefit:

Regular Members Only	
Age	Rate
Under 41	70%
41 - 45	75%
46	80%
47	85%
48	90%
49	95%
50+	100%

Marital Status:

Percentage Married	85%
Age difference	Males are assumed to be four years older than spouses.

Children: Special death benefits are provided to Department of Corrections employees who die in the line of duty and 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 life-only form of payment.

Assumed age for commencement of deferred benefits: Current 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).

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

Current inactive members with deferred benefits are assumed to commence benefits on the date provided by OPERS.

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

Oklahoma Public Employees Retirement System

Valuation Data Distribution – Actives – Regular Membership

	Years of Service									
Age	**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**
Under 25	1,193	15								1,208
Avg. Pay	$25,759	$31,374								$25,829
25 to 29	2,807	415	9							3,231
Avg. Pay	$32,395	$36,756	$45,132							$32,991
30 to 34	2,278	1,317	299	11						3,905
Avg. Pay	$34,226	$42,168	$43,887	$42,480						$37,668
35 to 39	1,920	1,212	850	217	2					4,201
Avg. Pay	$34,834	$41,980	$47,403	$45,056	$53,183					$39,976
40 to 44	1,478	1,040	822	675	145	2				4,162
Avg. Pay	$35,027	$41,987	$45,577	$49,509	$50,709	$46,299				$41,750
45 to 49	1,567	1,021	840	740	476	256	7			4,907
Avg. Pay	$34,871	$40,394	$44,156	$47,880	$50,771	$53,545	$53,813			$42,115
50 to 54	1,237	920	790	769	540	672	272	29		5,229
Avg. Pay	$34,124	$40,194	$43,507	$46,592	$47,633	$54,498	$58,064	$51,897		$43,800
55 to 59	1,082	964	881	760	551	601	442	261	7	5,549
Avg. Pay	$35,274	$40,162	$43,199	$44,953	$47,707	$52,701	$57,219	$53,897	$60,244	$44,485
60 to 64	694	756	700	629	429	428	239	242	85	4,202
Avg. Pay	$36,973	$40,993	$43,180	$44,772	$47,364	$51,148	$55,379	$57,835	$58,135	$45,079
65 to 69	228	309	300	231	162	140	89	70	48	1,577
Avg. Pay	$36,959	$42,211	$45,144	$46,432	$47,056	$52,946	$54,746	$58,631	$55,798	$45,928
70 & up	119	108	136	96	52	58	25	17	15	626
Avg. Pay	$32,469	$42,088	$38,057	$43,411	$47,240	$49,616	$54,882	$46,305	$59,643	$41,758
Total	14,603	8,077	5,627	4,128	2,357	2,157	1,074	619	155	38,797
Avg. Pay	$33,640	$41,020	$44,384	$46,546	$48,381	$52,980	$56,742	$55,670	$57,652	$41,166

Oklahoma Public Employees Retirement System

Valuation Data Distribution – Actives – Elected Membership

	Years of Service									
Age	**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**
Under 25	8									8
Avg. Pay	$30,748									$30,748
25 to 29	8	1								9
Avg. Pay	$30,977	$38,400								$31,802
30 to 34	14	3	5							22
Avg. Pay	$39,445	$45,273	$49,374							$42,496
35 to 39	18	21	8	5						52
Avg. Pay	$37,676	$51,777	$50,334	$51,466						$46,644
40 to 44	15	16	9	15	6					61
Avg. Pay	$36,651	$38,866	$59,933	$63,080	$54,944					$48,965
45 to 49	20	21	26	31	15	9	1			123
Avg. Pay	$46,345	$54,640	$55,956	$52,822	$55,916	$53,350	$49,213			$53,128
50 to 54	15	17	19	14	19	19	9	3		115
Avg. Pay	$47,397	$55,572	$53,051	$44,147	$59,847	$56,010	$52,518	$53,119		$53,174
55 to 59	23	31	23	22	16	23	12	6		156
Avg. Pay	$42,919	$47,424	$54,477	$51,761	$55,571	$51,586	$73,290	$59,523		$52,316
60 to 64	12	34	24	15	16	11	8	4	3	127
Avg. Pay	$51,482	$53,991	$48,399	$53,811	$48,160	$69,059	$59,976	$62,505	$45,819	$53,699
65 to 69	8	15	10	5	10	7	3	1		59
Avg. Pay	$46,722	$47,572	$52,738	$53,453	$45,045	$71,680	$47,133	$45,600		$51,207
70 & up	8	9	15	6	3		2		2	45
Avg. Pay	$45,612	$52,707	$41,213	$51,526	$48,942		$55,831		$50,544	$47,249
Total	149	168	139	113	85	69	35	14	5	777
Avg. Pay	$41,983	$50,413	$51,884	$52,933	$53,676	$57,858	$60,978	$58,008	$47,709	$51,039

Oklahoma Public Employees Retirement System

Valuation Data Distribution – Actives – Hazardous Duty Membership

	Years of Service									
Age	**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**
Under 25	259									259
Avg. Pay	$26,284									$26,284
25 to 29	324	33								357
Avg. Pay	$27,964	$32,508								$28,384
30 to 34	176	104	28							308
Avg. Pay	$28,394	$34,173	$36,111							$31,047
35 to 39	137	86	86	34						343
Avg. Pay	$27,678	$33,464	$36,121	$41,058						$32,572
40 to 44	71	54	70	96	8					299
Avg. Pay	$27,814	$34,145	$37,535	$42,365	$44,021					$36,339
45 to 49	70	32	53	85	23	8				271
Avg. Pay	$27,513	$30,557	$37,837	$42,153	$45,780	$50,024				$36,698
50 to 54	37	26	42	46	20	8	2			181
Avg. Pay	$26,858	$31,727	$34,952	$41,363	$43,572	$53,176	$42,607			$36,306
55 to 59	20	19	11	40	15	4	1			110
Avg. Pay	$29,414	$31,389	$32,889	$38,856	$41,488	$48,186	$43,517			$35,993
60 to 64	9	14	18	28	11	4				84
Avg. Pay	$28,374	$32,446	$34,521	$39,718	$43,391	$45,462				$36,932
65 to 69	1	2	6	4	1	2	1			17
Avg. Pay	$26,868	$31,421	$34,220	$40,768	$35,928	$48,712	$44,359			$37,401
70 & up		1	1	1						3
Avg. Pay		$35,656	$41,773	$39,862						$39,097
Total	1,104	371	315	334	78	26	4			2,232
Avg. Pay	$27,556	$33,155	$36,344	$41,371	$43,745	$49,909	$43,272			$32,649

Oklahoma Public Employees Retirement System

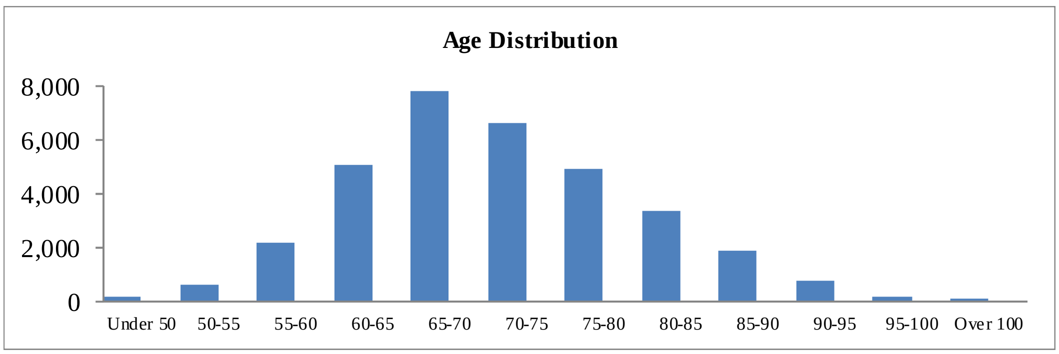
Valuation Data Distribution – Actives – All Membership Groups

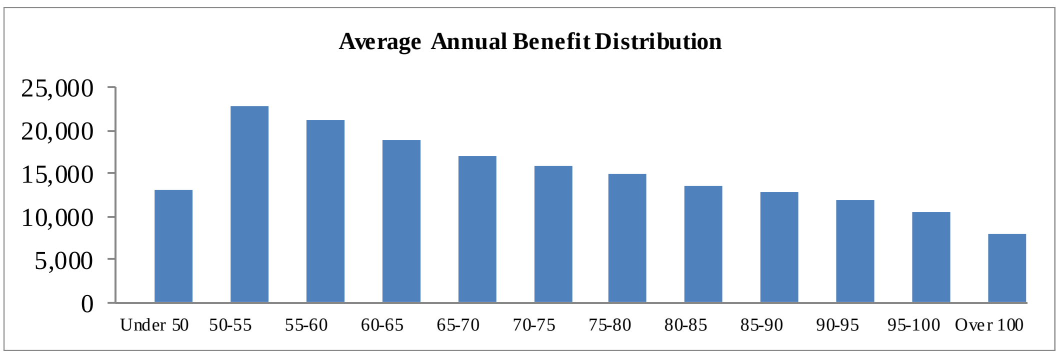
	Years of Service									
Age	**0 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 & Up**	**Total**
Under 25	1,460	15								1,475
Avg. Pay	$25,880	$31,374								$25,935
25 to 29	3,139	449	9							3,597
Avg. Pay	$31,934	$36,448	$45,132							$32,530
30 to 34	2,468	1,424	332	11						4,235
Avg. Pay	$33,840	$41,590	$43,314	$42,480						$37,211
35 to 39	2,075	1,319	944	256	2					4,596
Avg. Pay	$34,386	$41,581	$46,400	$44,650	$53,183					$39,499
40 to 44	1,564	1,110	901	786	159	2				4,522
Avg. Pay	$34,715	$41,560	$45,096	$48,895	$50,532	$46,299				$41,490
45 to 49	1,657	1,074	919	856	514	273	8			5,301
Avg. Pay	$34,699	$40,380	$44,126	$47,490	$50,698	$53,436	$53,238			$42,094
50 to 54	1,289	963	851	829	579	699	283	32		5,525
Avg. Pay	$34,070	$40,236	$43,298	$46,261	$47,893	$54,524	$57,778	$52,011		$43,750
55 to 59	1,125	1,014	915	822	582	628	455	267	7	5,815
Avg. Pay	$35,326	$40,220	$43,359	$44,839	$47,763	$52,632	$57,613	$54,023	$60,244	$44,534
60 to 64	715	804	742	672	456	443	247	246	88	4,413
Avg. Pay	$37,109	$41,394	$43,139	$44,764	$47,296	$51,541	$55,528	$57,911	$57,715	$45,172
65 to 69	237	326	316	240	173	149	93	71	48	1,653
Avg. Pay	$37,246	$42,392	$45,177	$46,483	$46,875	$53,769	$54,389	$58,448	$55,798	$46,029
70 & up	127	118	152	103	55	58	27	17	17	674
Avg. Pay	$33,297	$42,844	$38,393	$43,850	$47,333	$49,616	$54,952	$46,305	$58,572	$42,113
Total	15,856	8,616	6,081	4,575	2,520	2,252	1,113	633	160	41,806
Avg. Pay	$33,295	$40,865	$44,139	$46,326	$48,416	$53,094	$56,827	$55,721	$57,341	$40,895

Oklahoma Public Employees Retirement System

Valuation Data Distribution – Retired Members

	Number			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
Under 50	110	96	206	$ 1,737,095	$ 975,168	$ 2,712,263
50-55	325	280	605	7,779,520	5,968,254	13,747,774
55-60	840	1,342	2,182	19,061,413	27,197,224	46,258,637
60-65	2,007	3,089	5,096	39,545,552	56,808,055	96,353,607
65-70	3,334	4,475	7,809	60,570,671	72,432,433	133,003,104
70-75	2,859	3,789	6,648	50,054,798	55,922,868	105,977,666
75-80	2,109	2,833	4,942	35,431,061	38,610,787	74,041,848
80-85	1,360	2,035	3,395	20,369,970	25,498,295	45,868,265
85-90	685	1,218	1,903	9,847,541	14,624,025	24,471,566
90-95	221	524	745	3,195,588	5,756,481	8,952,069
95-100	43	150	193	531,362	1,516,212	2,047,574
Over 100	3	22	25	18,814	177,900	196,714
Total	13,896	19,853	33,749	$248,143,385	$305,487,702	$553,631,087





Oklahoma Public Employees Retirement System

	Actuarial Valuation as of 7/1/2016	Actuarial Valuation as of 7/1/2015	% Change
1. Active members			
a. Number	41,806	43,843	(4.6%)
b. Annual compensation	$ 1,790,809,603	$ 1,808,972,785	(1.0%)
c. Average annual compensation	42,836	41,260	3.8%
d. Average age	46.1	45.9	0.4%
e. Average service	10.1	9.9	2.0%
2. Accumulated member contributions			
a. Active members	$ 545,019,804	$ 537,045,712	1.5%
b. Unclaimed contribution amounts	44,418,135	40,683,862	9.2%
c. Total	$ 589,437,939	$ 577,729,574	2.0%
3. Vested terminated members			
a. Number	3,032	3,085	(1.7%)
b. Annual deferred benefits	$ 29,758,304	$ 29,679,529	0.3%
c. Average annual deferred benefit	9,815	9,621	2.0%
d. Annual supplemental medical insurance premiums	$ 3,820,320	$ 3,887,100	(1.7%)
4. Assumed deferred vested - count	2,914	2,778	4.9%
5. Retired members			
a. Number	28,524	27,624	3.3%
b. Annual retirement benefits	$ 498,444,764	$ 475,128,676	4.9%
c. Average annual retirement benefit	17,475	17,200	1.6%
d. Annual supplemental medical insurance premiums	$ 17,110,800	$ 16,914,240	1.2%
6. Beneficiaries			
a. Number	3,731	3,614	3.2%
b. Annual retirement benefits	$ 40,401,652	$ 38,775,748	4.2%
c. Average annual retirement benefit	10,829	10,729	0.9%
7. Disabled members			
a. Number	1,494	1,516	(1.5%)
b. Annual retirement benefits	$ 14,784,671	$ 14,875,484	(0.6%)
c. Average annual retirement benefit	9,896	9,812	0.9%
d. Annual supplemental medical insurance premiums	$ 850,500	$ 889,560	(4.4%)
8. Total members included in valuation	81,501	82,460	(1.2%)

Oklahoma Public Employees Retirement System

	Actuarial Valuation as of 7/1/2016	Actuarial Valuation as of 7/1/2015
Regular Members		
Number	38,797	41,060
Average annual compensation	$ 41,166	$ 39,586
Average age	46.4	46.1
Average service	10.2	9.9
Elected officials		
Number	777	754
Average annual compensation	$ 51,039	$ 50,035
Average age	53.3	53.4
Average service	13.8	13.7
Hazardous Duty		
Number	2,232	2,029
Average annual compensation	$ 32,649	$ 33,016
Average age	38.3	39.2
Average service	7.3	8.0
Total		
Number	41,806	43,843
Average annual compensation	$ 40,895	$ 39,461
Average age	46.1	45.9
Average service	10.1	9.9

Oklahoma Public Employees Retirement System

	Actuarial Valuation as of	
	7/1/2016	7/1/2015
Retirees		
Number	28,524	27,624
Average annual benefit	$ 17,475	$ 17,200
Average age	71.1	71.0
Disability Retirees		
Number	1,494	1,516
Average annual benefit	$ 9,896	$ 9,812
Average age	64.6	64.1
Beneficiaries		
Number	3,731	3,614
Average annual benefit	$ 10,829	$ 10,729
Average age	73.7	73.5
Total		
Number	33,749	32,754
Average annual benefit	$ 16,405	$ 16,144
Average age	71.1	70.9
Vested Members		
Number	5,946	5,863
Average annual benefit	$ 9,834	$ 9,636
Average age	52.1	52.0

	Active Members	Vested Terminated	Receiving Benefits: Retirees	Receiving Benefits: Disability Retirees	Receiving Benefits: Benefici-aries	Total Members
As of July 1, 2015	**43,843**	**5,863**	**27,624**	**1,516**	**3,614**	**82,460**
Age retirements	(1,553)	(338)	1,891	0	0	0
Disability retirements	(26)	(22)	0	48	0	0
Deaths without payments continuing	(56)	(21)	(732)	(49)	(197)	(1,055)
Deaths with payments continuing	(28)	(10)	(255)	(22)	315	0
Nonvested terminations/refund of contributions	(4,309)	(117)	0	0	0	(4,426)
Vested terminations	(709)	709	0	0	0	0
Transfers	(5)	(16)	0	0	0	(21)
Data adjustments	0	11	5	1	(1)	16
Rehires	927	(113)	(9)	0	0	805
New entrants during the year	3,722	0	0	0	0	3,722
Net change	(2,037)	83	900	(22)	117	(959)
As of July 1, 2016	**41,806**	**5,946**	**28,524**	**1,494**	**3,731**	**81,501**

	Active	Retired	Terminated Vested	Total
Records submitted on data file	41,479	58,300	3,032	102,811
Remove deceased retirees	0	(24,547)	0	(24,547)
Remove unusable data	(11)	0	0	(11)
Remove those with another status	(18)	(4)	0	(22)
Add those with no application	356	0	0	356
Add assumed vesteds	0	0	2,914	2,914
Total valued	**41,806**	**33,749**	**5,946**	**81,501**

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.

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.