



OKLAHOMA FIREFIGHTERS PENSION & RETIREMENT SYSTEM

Actuarial Valuation Report
As of June 30, 2018

**Prepared by
Retirement Horizons Inc.
October 9, 2018**



October 9, 2018

Mr. Chase Rankin
Executive Director
Oklahoma Firefighters Pension and Retirement System
6601 Broadway Extension, Suite 100
Oklahoma City, OK 73116

Re: 2018 ACTUARIAL VALUATION

Dear Chase:

The Oklahoma Firefighters Pension and Retirement System retained Retirement Horizons Inc. (RHI) to perform an actuarial valuation of the funding policy for the Oklahoma Firefighters Pension and Retirement System. This report summarizes the results of our study as of July 1, 2018, including the recommended contribution for the upcoming fiscal year. Our report also provides financial accounting and disclosure information in accordance with GASB 67 for the fiscal year ending June 30, 2018, with results organized as follows:

- Section 1 – Valuation Highlights
- Section 2 – Executive Summary
- Section 3 – Actuarial Exhibits
- Section 4 – Valuation Basis

We certify the amounts presented in the 2018 valuation report have been determined according to the actuarial assumptions and methods selected by the Oklahoma Firefighters Pension and Retirement System, with review and concurrence by RHI. However, it is important to note that future results may be materially different if actual plan experience varies significantly from the underlying valuation basis. Differences could occur for a number of reasons such as plan experience differing from underlying demographic and economic assumptions, changes in the plan provisions, or changes in the law or accounting standards. Due to the limited scope of this report, an analysis of the potential range of impact on results from all such future measurements has not been performed.

The 2018 actuarial valuation was based upon member census data, unaudited financial information, and benefit provisions as provided by the Oklahoma Firefighters Pension and Retirement System. We relied on the member census data provided, and performed testing as needed to assure the reasonableness of the underlying input and the results of the study, but RHI did not perform a full audit of the member census data. The 2018 valuation was prepared in accordance with generally accepted actuarial principles and practices including compliance with applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

Information contained in this report was prepared for the Oklahoma Firefighters Pension and Retirement System as well as the auditors of the GASB 67 financial disclosure information. If the results of the

Chase Rankin
October 9, 2018

Oklahoma Firefighters Pension and Retirement System's audited financials differ from the asset values used in this report, then the GASB exhibits contained herein may need to be updated.

The results in this report are not intended for any other purposes and should not be distributed to any outside party without the express written consent of RHI, as significantly different results from those contained in this report may be needed for other purposes.

The measures of funded status for long-term funding policy should not be relied upon for assessing the sufficiency of plan assets for settlement of liabilities for plan termination. Likewise, the measurements of funded status for GASB 68 accounting disclosures should not necessarily be relied upon for assessing the need for or amount of future contributions or for assessing the sufficiency of plan assets for settlement of plan liabilities for plan termination.

The undersigned has met the "Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States" and is available to respond to questions regarding the information contained in this report or to provide further details or explanations as needed, respectfully submitted by Retirement Horizons Inc.

A handwritten signature in black ink, appearing to read "D. Kent", with a stylized flourish at the end.

David Kent
Fellow of the Society of Actuaries
Member of the American Academy of Actuaries

Table of Contents

1.	Valuation Highlights	5
2.	Executive Summary	
2.1	Fair Value of Plan Assets	7
2.2	Present Value of Projected Benefits.....	8
2.3	Actuarial Accrued Liability	9
2.4	Funding Policy Analysis.....	10
2.5	GASB 67 Accounting Information.....	11
3.	Actuarial Exhibits	
3.1	Fair Value of Plan Assets	12
3.2	Actuarial Value of Plan Assets	13
3.3	Actuarial Present Value of Projected Benefits	14
3.4	Actuarial Accrued Liability	15
3.5	Funding Policy	16
3.6	GASB 67 Plan Accounting Information	17
4.	Valuation Basis	
4.1	Demographic Summary	20
4.2	Age Service Chart.....	21
4.3	Assumptions and Methods.....	22
4.4	Plan Provisions.....	29

1. Valuation Highlights

FUNDING VALUATION	July 1, 2017	July 1, 2018
Fair Value of Assets	\$2,509,471,449	\$2,719,895,921
Average Annual Return: prior year	13.6%	11.7%
Actuarial Value of Assets	\$2,464,615,244	\$2,619,169,737
Average Annual Return: prior year	9.7%	9.7%
Present Value of Projected Benefits	\$4,437,959,406	\$4,543,920,438
Actuarial Accrued Liability	\$3,767,195,100	\$3,845,542,352
% funded	65.4%	68.1%
Unfunded Actuarial Accrued Liability	\$1,302,579,856	\$1,226,372,615
Actuarially Determined Contribution	\$115,478,708	\$107,540,881

DEMOGRAPHICS

Active	12,378	12,352
Terminated with Vested Benefits	1,506	2,079
Retired or Disabled	8,790	8,681
Beneficiary	2,253	2,412
DROP Members	57	48
Total	24,984	25,572
Valuation Compensation	\$280,310,219	\$299,051,848
Average Pay	\$67,012	\$69,790

ASSUMPTIONS

Investment Return	7.50%	7.50%
Inflation	3.00%	3.00%

1. Valuation Highlights (continued)

<u>GASB 67 PLAN ACCOUNTING DISCLOSURE</u>	<u>Fiscal Year Ending June 30, 2017</u>	<u>Fiscal Year Ending June 30, 2018</u>
Total Pension Liability	\$3,767,195,100	\$3,845,542,352
Plan Fiduciary Net Position	<u>\$2,509,471,449</u>	<u>\$2,719,895,921</u>
GASB 67 Fund Net Pension Liability	\$1,257,723,651	\$1,125,646,431
Effective Discount Rate	7.50%	7.50%

2.1 Fair Value of Plan Assets

The Oklahoma Firefighters Pension and Retirement System makes contributions to a pension trust to fund the participants' retirement benefits. Total Fair Value of Plan Assets (FVA) was \$2.720 billion as of July 1, 2018, compared to \$2.509 billion for the prior valuation as of July 1, 2017. The net annual increase of \$0.211 billion is the result of net investment return of \$0.290 billion plus contributions of \$0.168 billion offset by benefit payments and administrative expense of \$0.248 billion. Below is a comparison of changes in the plan assets over the last 3 years.

<i>July 1</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>
Assets at Beginning of Period	\$2,283,566,382	\$2,255,758,597	\$2,509,471,449
Net Benefits and Expenses	(\$198,082,582)	(\$202,602,341)	(\$247,752,193)
Contributions	\$156,035,902	\$153,695,636	\$168,010,736
Return on Assets	<u>\$14,238,895</u>	<u>\$302,619,557</u>	<u>\$290,165,929</u>
Assets at End of Period	\$2,255,758,597	\$2,509,471,449	\$2,719,895,921

Please see Exhibit 3.1 for more details on the development of plan assets.

For purposes of funding calculations, the Oklahoma Firefighters Pension and Retirement System uses a standard asset valuation method to "smooth" fluctuations in fair market value that occurred during the prior five plan years. An expected actuarial value is determined equal to the prior year's Actuarial Value of Assets (AVA) plus cash flow (excluding investment expenses and realized and unrealized gains and losses) for the year ended on the valuation date and assuming a 7.5% investment return. Twenty percent of any (gain)/loss as measured by the difference between the expected actuarial value and the market value at the valuation date is added to the expected actuarial value plus prior unrecognized gains or losses. The (gain)/loss is amortized over 5 years. The result is constrained to a value of 80% to 120% of the market value of assets.

The total AVA was \$2.619 billion as of July 1, 2018, compared to \$2.465 billion for the prior year. The net increase of \$0.154 billion is primarily attributable to funding and positive investment returns recognized under the asset smoothing method, partially offset by the prior year benefit disbursements. Please see Exhibit 3.2 for development of the actuarial value of assets. Below is a comparison of the AVA to the FVA over the last three years.

<i>July 1</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>
Fair Value of Assets	\$2,255,758,597	\$2,509,471,449	\$2,719,895,921
Actuarial Value of Assets	\$2,292,698,277	\$2,464,615,244	\$2,619,169,737
Deferred Gain/(Loss)	(\$36,939,680)	\$44,856,205	\$100,726,184

2.2 Present Value of Projected Benefits

The true cost of a pension plan is the accumulation of benefit payments less investment income (net of expenses), over the lifetime of the program. In the actuarial valuation process, we use a mathematical model to project the future stream of plan benefits. The model incorporates current plan provisions and member census data, using the actuarial assumptions to predict future events.

Discounting the stream of expected future benefit payments for the time value of money produces the *Present Value of Projected Benefits (PVPB)*. This represents the hypothetical amount of plan assets necessary to fully fund all future plan costs for the current population – assuming future plan experience follows the actuarial assumptions. The *Actuarial Accrued Liability (AAL)* represents the portion of the PVPB attributed to service as of the valuation date under the Unit Credit (UC) cost method. For a frozen plan, the PVPB and AAL are the same amounts when using the UC cost method.

The total PVPB was \$4.544 billion as of July 1, 2018, compared to \$4.438 billion for the prior valuation as of July 1, 2017. The net increase of \$0.106 billion is primarily attributable to normal operation of the plan, offset by the plan change requiring the interest on DROP balances be paid out each year. Below is a reconciliation of changes in the PVPB over the last 2 years.

<i>July 1</i>	<i>2017</i>	<i>2018</i>
PVB at Beginning of Period	\$4,151,759,464	\$4,437,959,406
Net Benefits Paid	(\$200,214,567)	(\$245,653,823)
Decrease in Discount Period	\$303,873,914	\$323,634,937
Plan Experience	\$182,540,595	\$216,557,703
Change in Assumptions	\$0	\$0
Change in Plan Provisions	\$0	(\$188,577,785)
PVB at End of Period	\$4,437,959,406	\$4,543,920,438

Please see Exhibit 3.3 for more details on the development of the PVPB.

2.3 Actuarial Accrued Liability

As a practical matter, few plan sponsors can afford to fully fund all future benefits before they have been earned. Under generally accepted actuarial standards, the actuarial present value of projected benefits is allocated over periods of employee service, applying a mathematical formula known as an actuarial cost method. The portion assigned to past years of service is called the *actuarial accrued liability (AAL)*. This is also referred to as the past service liability, since it takes into account future pay increases but not future service. The remainder of the present value of future benefits is referred to as the *actuarial present value of future normal costs*, also known as the future service liability.

The total AAL was \$3.846 billion as of July 1, 2018, compared to \$3.767 billion for the prior year. The net increase of \$0.079 billion is primarily due to normal operation of the plan, offset by the gain from the plan provision change mentioned above. Please see Exhibit 3.4 for more details. Below is a reconciliation of changes in the AAL over the last 2 years.

<i>July 1</i>	<i>2017</i>	<i>2018</i>
AAL at Beginning of Period	\$3,477,473,104	\$3,767,195,100
Benefits Accumulated	\$61,489,198	\$64,638,597
Net Benefits Paid	(\$200,214,567)	(\$245,653,823)
Decrease in Discount Period	\$257,914,126	\$278,175,509
Plan Experience	\$170,533,239	\$125,283,130
Change in Assumptions	\$0	\$0
Change in Plan Provisions	\$0	(\$144,096,161)
AAL at End of Period	\$3,767,195,100	\$3,845,542,352

2.4 Funding Policy Analysis

The Oklahoma Firefighters Pension and Retirement System makes annual contributions to the pension trust equal to sum of Normal Cost and budgeted expenses plus an amortization amount of the Unfunded Actuarial Accrued Liability (UAAL) minus the expected member contributions. The UAAL amortization period is based on a closed 30-year period beginning July 1, 2014 (currently 26 years).

The recommended State Contribution for the fiscal year ending June 30, 2019 is \$107.5 million, compared to \$115.5 million for the prior fiscal year. The decrease is primarily due to the favorable return on AVA. The estimated Employer Contributions for the same periods are \$42.6 million and \$40.1 million, respectively. Please see Exhibit 3.5 for more details.

Below is a history of the Employer and State's annual required contribution and actual contribution over the last 2 years.

<i>Year Ended June 30</i>	<i>Annual Required Contribution</i>	<i>Actual Contributions</i>
2017	\$141,509,975	\$122,700,844
2018	\$155,547,401	\$136,348,698
2019	\$150,174,973	

Please note that the annual required contribution is provided as of mid-year. The actual contributions shown above have been reduced by the contribution paid to participants under the Back-DROP provisions of the plan (\$5,575,441 for 2018 and \$5,758,549 for 2017).

2.5 GASB 67 Accounting Information

The GASB adopted changes to GASB Statement Nos. 25 and 27, creating GASB statement Nos 67 and 68. This statement applies solely to the actuarial valuation for accounting disclosures only, and does not require any change to the calculation of the actuarially determined funding policy. The accounting statement expanded the disclosure information required for the sponsoring employer and also increased the complexity of the actuarial calculations. Below is a high-level summary of the impact for the Oklahoma Firefighters Pension and Retirement System based on our current understanding of the guidance issued to date:

- Terminology – GASB 67 and 68 introduced new labels for the traditional actuarial terminology that was used in GASB 25 and 27. The actuarial accrued liability is referred to as the Total Pension Liability, the fair market value of assets is referred to as the Plan Fiduciary Position, and the unfunded actuarial liability and balance sheet liability are now referred to as the Net Pension Liability.
- Net Pension Liability – Under GASB 67, the Fund must recognize the unfunded actuarial liability on its balance sheet. Based on the June 30, 2018 actuarial valuation, the Fund's Net Pension Liability decreased from \$1.258 billion to \$1.126 billion.
- Discount Rate Assumption – To the extent current plan assets and funding policy are not sufficient to cover projected plan benefit payments, the net pension liability would be measured using a blended discount rate based on the plan's long-term actuarial assumption for the funded portion and a 30-year municipal bond index rate (AA/Aa or higher) for the unfunded portion. Based on the 2018 valuation projections, this provision will not impact the results.
- Pension Expense – Under GASB 68, the calculation of pension expense for the City's financial statements will result in more rapid cost recognition of changes in the Net Pension Liability than prior rules. The GASB 68 pension expense will equal the sum of the following components:
 - Service Cost for additional benefits accrued.
 - Administrative Expenses paid during the fiscal year.
 - Interest Cost on Total Pension Liability less Expected Return on Plan Fiduciary Position.
 - Amortization of changes in the components of Net Pension Liability:
 - Full and immediate recognition of plan changes and improvements.
 - Plan asset experience gains and losses amortized over 5 years.
 - Plan liability experience gain/loss amortized over future service.
 - Impact of assumption changes amortized over future service.
- Expanded Disclosure – Exhibit 3.6 provides the GASB 67 disclosure information for June 30, 2017 and June 30, 2018.

3.1 Fair Value of Plan Assets

	<u>July 1, 2017</u>	<u>July 1, 2018</u>
A. Fair Value of Plan Assets		
1. Cash and Short-term Investments	\$57,633,745	\$70,883,218
2. Receivables	\$24,801,415	\$24,630,924
3. Investments at Fair Value		
a. U.S. Government Securities	\$35,750,067	\$82,716,321
b. Domestic Bonds	\$184,517,076	\$145,557,591
c. International Corporate Bonds	\$95,569,404	\$86,553,887
d. Domestic Equities	\$1,187,590,210	\$1,302,475,738
e. International Equities	\$311,103,879	\$352,895,617
f. Private Equity	\$201,512,739	\$238,247,629
g. Low Volatility Hedge Funds	\$11,523,012	\$1,523,988
h. Long/Short Hedge Funds	\$77,280,333	\$81,835,067
i. Real Estate	\$329,877,649	\$352,543,734
j. Securities Lending	<u>\$76,510,460</u>	<u>\$88,146,621</u>
k. Total	\$2,511,234,829	\$2,732,496,193
4. Assets Used in Plan Operations	<u>\$1,068,567</u>	<u>\$1,008,094</u>
5. Total assets	\$2,594,738,556	\$2,829,018,429
6. Liabilities	<u>(\$85,267,107)</u>	<u>(\$109,122,508)</u>
7. Net Assets for Pension Benefits	\$2,509,471,449	\$2,719,895,921
B. Change in Fair Value		
		<u>Change</u>
1. Contributions		
a. Members		\$26,086,597
b. City		\$41,590,815
c. Insurance Premium Tax		<u>\$100,333,324</u>
d. Total		\$168,010,736
2. Disbursements		
a. Monthly Payments (including contribution refunds)		(\$245,653,823)
b. Annuity Purchase		\$0
c. Administrative Expenses		<u>(\$2,098,370)</u>
d. Total		(\$247,752,193)
3. Net Investment Return		<u>\$290,165,929</u>
4. Net Change		<u><u>\$210,424,472</u></u>
5. Average Rate of Return		
a. Average Asset Value		\$2,469,600,721
b. Income Net of Investment Expenses		\$290,165,929
c. Annual Return Net of Investment Expenses		11.75%
6. Investment Gain/(Loss)		\$104,945,875
7. DROP Assets included in Assets Above		
a. Beginning of Year		\$749,510,185
b. End of Year		\$784,004,758

3.2 Actuarial Value of Plan Assets

	<u>July 1, 2017</u>	<u>July 1, 2018</u>
A. Expected Rate of Return on Assets	7.50%	7.50%
B. (Gain)/Loss on Actuarial Value of Assets		
1. Actuarial Value at Prior Year	\$2,292,698,277	\$2,464,615,244
2. Contributions for Prior Year	\$153,695,636	\$168,010,736
3. Disbursements for Prior Year	(\$202,602,341)	(\$247,752,193)
4. Expected Return on:		
a. Item 1	\$171,952,371	\$184,846,143
b. Item 2	\$5,763,586	\$6,300,403
c. Item 3	(\$7,597,588)	(\$9,290,707)
5. Expected Value at Current Year	\$2,413,909,941	\$2,566,729,626
6. Unrecognized Asset Gain/(Loss) as of prior Year	(\$36,939,680)	\$44,856,205
7. Expected Actuarial Value for the Current Year	\$2,376,970,261	\$2,611,585,831
8. Market Value as of Current Year	\$2,509,471,449	\$2,719,895,921
9. Current Year Asset Gain/(Loss)	\$132,501,188	\$108,310,090
C. Actuarial Value of Assets		
1. Expected Actuarial Value	\$2,413,909,941	\$2,566,729,626
2. 20% of prior year (Gains)/Losses	\$26,500,238	\$21,662,018
3. 20% of prior year -1 (Gains)/Losses	(\$29,472,815)	\$26,500,238
4. 20% of prior year -2 (Gains)/Losses	(\$6,476,972)	(\$29,472,815)
5. 20% of prior year -3 (Gains)/Losses	\$40,227,641	(\$6,476,972)
6. 20% of prior year -4 (Gains)/Losses	\$19,927,211	\$40,227,642
7. Preliminary Actuarial Value	\$2,464,615,244	\$2,619,169,737
8. Corridor Limits:		
a. 80% of Fair Value	\$2,007,577,159	\$2,175,916,736
b. 120% of Fair Value	\$3,011,365,738	\$3,263,875,105
9. Final Actuarial Value	\$2,464,615,244	\$2,619,169,737
D. Change in Asset Values	<u>Change</u>	
1. Contributions	\$168,010,736	
2. Disbursements		
a. Monthly Payments (including contribution refunds)	(\$245,653,823)	
b. Annuity Purchase	\$0	
c. Administrative Expenses	(\$2,098,370)	
d. Total	(\$247,752,193)	
3. Investment Return	\$234,295,950	
4. Net Change	\$154,554,493	
5. Average Rate of Return - Accrual Basis		
a. Average Asset Value	\$2,424,744,516	
b. Income Net of Expenses	\$234,295,950	
c. Annual Rate of Return	9.66%	

3.3 Actuarial Present Value of Projected Benefits

	<u>July 1, 2017</u>	<u>July 1, 2018</u>
A. Discount Rate	7.50%	7.50%
B. Present Value of Projected Benefits		
1. Paid		
a. Active	\$1,799,762,824	\$1,826,220,588
b. Deferred Vested	\$9,859,173	\$16,183,539
c. Retirees	\$701,300,259	\$718,126,083
d. Disabled	\$612,907,194	\$626,797,884
e. Beneficiaries	\$229,564,501	\$243,027,061
f. DROP Plan Members - Annuity	\$26,926,345	\$21,960,470
g. DROP Plan Members - Account Balance	<u>\$849,175,278</u>	<u>\$872,558,621</u>
h. Paid Total	\$4,229,495,574	\$4,324,874,246
2. Volunteer		
a. Active	\$70,277,088	\$78,475,265
b. Deferred Vested	\$23,032,251	\$25,648,081
c. Retirees	\$115,037,339	\$92,534,026
d. Disabled	Included Above	\$5,317,175
e. Beneficiaries	Included Above	\$17,025,020
f. DROP Plan Members - Annuity	<u>\$117,154</u>	<u>\$46,625</u>
g. Volunteer Total	<u>\$208,463,832</u>	<u>\$219,046,192</u>
3. Grand Total	<u><u>\$4,437,959,406</u></u>	<u><u>\$4,543,920,438</u></u>
C. Change in Present Value of Projected Benefits		
		<u>Change</u>
1. Benefits Accumulated		\$0
2. Benefits Paid		(\$245,653,823)
3. Decrease in Discount Period		\$323,634,937
4. Plan Experience		\$216,557,703
5. Actuarial Assumptions		\$0
6. Actuarial Methods		\$0
7. Plan Amendments		<u>(\$188,577,785)</u>
8. Net Change		<u><u>\$105,961,032</u></u>
D. Actuarial Value of Assets	<u>\$2,464,615,244</u>	<u>\$2,619,169,737</u>
E. Unfunded Liability	\$1,973,344,162	\$1,924,750,701

3.4 Actuarial Accrued Liability

	<u>July 1, 2017</u>	<u>July 1, 2018</u>
A. Discount Rate	7.50%	7.50%
B. Actuarial Accrued Liability (EAN)		
1. Paid		
a. Active	\$1,142,446,974	\$1,147,897,397
b. Inactive	<u>\$2,429,732,750</u>	<u>\$2,498,653,658</u>
c. Paid Total	\$3,572,179,724	\$3,646,551,055
2. Volunteer		
a. Active	\$56,828,632	\$58,420,370
b. Inactive	<u>\$138,186,744</u>	<u>\$140,570,927</u>
c. Volunteer Total	\$195,015,376	\$198,991,297
3. Grand Total	<u>\$3,767,195,100</u>	<u>\$3,845,542,352</u>
C. Actuarial Value of Assets		
1. Paid Members	\$2,337,030,169	\$2,483,638,273
2. Volunteer Members	<u>\$127,585,075</u>	<u>\$135,531,464</u>
3. Total	<u>\$2,464,615,244</u>	<u>\$2,619,169,737</u>
D. Unfunded Actuarial Liability		
1. Paid Members	\$1,235,149,555	\$1,162,912,782
2. Volunteer Members	<u>\$67,430,301</u>	<u>\$63,459,833</u>
3. Total	<u>\$1,302,579,856</u>	<u>\$1,226,372,615</u>
E. Change in Unfunded Actuarial Accrued Liability	<u>Change</u>	
1. Contributions	(\$168,010,736)	
2. Benefits Accumulated	\$64,638,597	
3. Decrease in Discount Period	\$96,319,670	
4. Administrative Expenses	\$2,098,370	
5. Plan Asset Experience	(\$52,440,111)	
6. Plan Liability Experience	\$125,283,130	
7. Actuarial Assumptions	\$0	
8. Actuarial Methods	\$0	
9. Plan Amendments	<u>(\$144,096,161)</u>	
10. Net Change	<u>(\$76,207,241)</u>	
F. Funded Status	65.4%	68.1%
G. Present Value of Future Normal Cost	\$670,764,306	\$698,378,086
H. Normal Cost (EAN)		
1. Paid Members	\$62,458,409	\$63,369,707
2. Volunteer Members	<u>\$2,180,188</u>	<u>\$2,874,956</u>
3. Total	\$64,638,597	\$66,244,663
I. Covered Payroll	\$280,310,219	\$299,051,848
J. Remaining Amortization Years (30-year amortization from July 1, 2014)	27	26

3.5 Funding Policy

	<u>July 1, 2017</u>	<u>July 1, 2018</u>
Summary of Contribution Requirements		
A. Total Normal Cost Mid-Year		
1. Paid Members	\$64,758,257	\$65,703,111
2. Volunteer Members	<u>\$2,260,467</u>	<u>\$2,980,817</u>
3. Total	\$67,018,724	\$68,683,928
B. Unfunded Actuarial Accrued Liability (UAAL)		
1. Paid Members	\$1,235,149,555	\$1,162,912,782
2. Volunteer Members	<u>\$67,430,301</u>	<u>\$63,459,833</u>
3. Total	\$1,302,579,856	\$1,226,372,615
C. Amortization of UAAL		
1. Paid Members	\$104,120,650	\$99,262,288
2. Volunteer Members	<u>\$5,684,240</u>	<u>\$5,416,716</u>
3. Total	\$109,804,890	\$104,679,004
D. Budgeted Expenses		
1. Paid Members	\$3,747,140	\$3,533,865
2. Volunteer Members	<u>\$204,567</u>	<u>\$192,842</u>
3. Total	\$3,951,707	\$3,726,707
E. Total Required Contribution		
1. Paid Members	\$172,626,047	\$168,499,264
2. Volunteer Members	<u>\$8,149,274</u>	<u>\$8,590,375</u>
3. Total	\$180,775,321	\$177,089,639
F. Estimated Member Contribution		
1. Paid Members	\$25,227,920	\$26,914,666
2. Volunteer Members	<u>\$0</u>	<u>\$0</u>
3. Total	\$25,227,920	\$26,914,666
G. Estimated Employer Contribution		
1. Paid Members	\$39,576,843	\$42,149,982
2. Volunteer Members	<u>\$491,850</u>	<u>\$484,110</u>
3. Total	\$40,068,693	\$42,634,092
H. Required State Contribution		
1. Paid Members	\$107,821,284	\$99,434,616
2. Volunteer Members	<u>\$7,657,424</u>	<u>\$8,106,265</u>
3. Total	\$115,478,708	\$107,540,881

3.6 GASB 67 Plan Accounting Information

Schedule of Changes in Net Pension Liability and Related Ratios

	<u>June 30, 2017</u>	<u>June 30, 2018</u>
Total Pension Liability		
Service Cost	\$61,489,198	\$64,638,597
Interest	\$257,914,126	\$278,175,509
Changes of benefit terms	\$0	(\$144,096,161)
Differences between expected and actual experience	\$170,533,239	\$125,283,130
Changes of assumptions	\$0	\$0
Benefit payments, including refunds of member contributions	(\$200,214,567)	(\$245,653,823)
Net change in total pension liability	\$289,721,996	\$78,347,252
Total pension liability - beginning	\$3,477,473,104	\$3,767,195,100
Total pension liability - ending (a)	\$3,767,195,100	\$3,845,542,352
Plan fiduciary net position		
Contributions - employer	\$128,459,393	\$141,924,139
Contributions - member	\$25,236,243	\$26,086,597
Net investment income	\$302,619,557	\$290,165,929
Benefit payments, including refunds of member contributions	(\$200,214,567)	(\$245,653,823)
Administrative expense	(\$2,387,774)	(\$2,098,370)
Other	\$0	\$0
Net change in plan fiduciary net position	\$253,712,852	\$210,424,472
Plan fiduciary net position - beginning	\$2,255,758,597	\$2,509,471,449
Plan fiduciary net position - ending (b)	\$2,509,471,449	\$2,719,895,921
Fund's net pension liability - ending (a) - (b)	\$1,257,723,651	\$1,125,646,431
Plan fiduciary net position as a percentage of the total pension liability	66.6%	70.7%
Actual Covered-employee payroll	\$285,073,253	\$303,090,745
Fund's net position liability as a percentage of covered employee payroll	441.2%	371.4%

3.6 GASB 67 Plan Accounting Information (continued)

Schedule of Oklahoma Firemens Pension and Retirement System's Contributions

	<u>June 30, 2017</u>	<u>June 30, 2018</u>
Actuarially determined contribution	\$141,509,975	\$155,547,401
Contributions in relation to the actuarially determined contribution	\$122,700,844	\$136,348,698
Contribution deficiency (excess)	\$18,809,131	\$19,198,703
Actual covered-employee payroll	\$285,073,253	\$303,090,745
Contributions as a percentage of covered-employee payroll	43.0%	45.0%

Notes to Schedule

Valuation date: July 1, 2018

The actuarially determined contributions are based on the normal cost plus administrative expenses plus the amortization of the unfunded actuarial liability over the average future working lifetime of active members, offset by the member's contributions (9% of payroll).

Based on a projection of future cash flows, the plan is projected to be able to meet all future obligations. Consequently, the expected rate of return of 7.50% is used to measure liabilities rather than a blended rate. There have been no assumption changes since the prior valuation.

Please note that the actual contributions have been reduced for the amount of the contribution paid out to Plan B DROP participants (\$5,575,441 for 2018 and \$5,758,549 for 2017).

3.6 GASB 67 Plan Accounting Information (continued)

Notes to Schedule

Discount rate: The discount rate used to measure the total pension liability was 7.50% net of investment expense. The projection of cash flows used to determine the discount rate assumed that the Fund's contributions will continue to follow the current funding policy. Total covered employee payroll is assumed to grow at 4% per year. The total statewide insurance premium tax is assumed to grow at 3% per year. In addition, the allocation of the tax to the System is assumed to be 36% for the entire projection period. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension investments was applied to all period of benefit payments to determine the total pension liability.

Sensitivity of the net pension liability to changes in the Discount rate . The following presents the net pension liability, calculated using the discount rate of 7.50% as well as what the net pension liability would be if it were to calculated using the discount rate that is 1-percentage-point lower (6.50%) or 1-percentage-point higher (8.50%) than the current rate:

	1% Decrease <u>(6.50%)</u>	Current Discount Rate <u>(7.50%)</u>	1% Increase <u>(8.50%)</u>
Net Pension Liability	\$1,474,374,208	\$1,125,646,431	\$832,769,504

4.1 Demographic Summary

	<u>July 1, 2017</u>	<u>July 1, 2018</u>
A. Active Paid Members		
1. Number	4,183	4,285
2. Total Payroll	\$280,310,219	\$299,051,848
3. Average Payroll	\$67,012	\$69,790
4. Average age*		39.4
5. Average vesting service*		13.3
B. Active Volunteer Members		
1. Number	8,195	8,067
2. Average age*		38.3
3. Average vesting service*		9.1
C. Terminated Vested		
1. Number**	1,506	2,079
2. Total benefits	\$3,264,614	\$4,178,249
3. Average annual benefits	\$2,168	\$2,010
D. Retired or Disabled		
1. Number	8,790	8,681
2. Total benefits	\$129,264,383	\$130,104,325
3. Average annual benefits	\$14,706	\$14,987
E. Beneficiaries		
1. Number	2,253	2,412
2. Total benefits	\$28,828,102	\$31,200,789
3. Average annual benefits	\$12,795	\$12,936
F. DROP Members		
1. Total Number	57	48
2. Number Paid	52	45
3. Number Volunteer	5	3
4. Total Payroll	\$4,763,034	\$4,038,897
5. Total benefits	\$2,119,834	\$1,734,637
6. Average annual benefits	\$37,190	\$36,138

* Age and Service was not split in 2017. The total for Paid and Volunteer was an age of 38.5 years and 10.4 years of service

** 2018 includes those members who are due a refund of contributions

4.2 Age Service Chart

Paid Members

Attained Age	Years of Vesting Service as of July 1, 2018							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 & up	
Under 25	240	6	0	0	0	0	0	246
25-29	412	169	1	1	0	0	0	583
30-34	252	315	163	1	0	0	0	731
35-39	114	184	318	100	0	0	0	716
40-44	54	87	203	279	88	1	0	712
45-49	17	31	107	161	245	70	2	633
50-54	2	12	34	78	124	111	34	395
55-59	1	1	6	30	72	57	53	220
60-64	0	0	1	5	9	14	20	49
65 & up	0	0	0	0	0	0	0	0
Total	1092	805	833	655	538	253	109	4285

Not Vested	Vested	Retirement Eligible
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Volunteer Members

Attained Age	Years of Vesting Service as of July 1, 2018							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 & up	
Under 25	942	64	0	0	0	0	0	1006
25-29	601	377	43	0	0	0	0	1021
30-34	548	412	279	32	0	0	0	1271
35-39	489	372	343	194	9	0	0	1407
40-44	293	286	289	181	103	5	0	1157
45-49	134	232	257	178	120	36	2	959
50-54	11	121	180	192	93	35	13	645
55-59	1	12	79	161	82	30	26	391
60-64	0	0	3	65	60	25	17	170
65 & up	0	0	0	3	21	9	7	40
Total	3019	1876	1473	1006	488	140	65	8067

Not Vested	Vested	Retirement Eligible
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4.3 Assumptions and Methods

Paid Firefighters

Economic Assumptions

- Funding Policy Interest Rate: 7.50% per year net of investment expenses
- GASB 67 Discount Rate 7.50% per year
- Individual Salary Increases Sample Rates Below:

Attained Service	Inflation %	Merit %	Increase %
0	3.00	6.00	9.00
1	3.00	5.50	8.50
2	3.00	5.00	8.00
3	3.00	4.90	7.90
4	3.00	4.75	7.75
5	3.00	4.50	7.50
10	3.00	3.55	6.55
15	3.00	1.65	4.65
20	3.00	1.20	4.20
25	3.00	1.00	4.00
30 or more	3.00	0.50	3.50

Demographic Assumptions

Mortality:

- Active Employees Pre-Retirement RP-2000 with Blue Collar Healthy Combined with generational mortality improvement using Scale AA.
- Retired Members RP-2000 with Blue Collar Healthy Combined with generational mortality improvement using Scale AA.
- Disabled Members RP-2000 with Blue Collar Healthy Combined.
- Termination Graduated Rates. See table below for sample values.

Attained Service	Termination
0	3.00%
1	3.50%
2	3.00%
3	2.00%
4	2.00%
5-9	1.00%
10-14	0.80%
15+	0.40%

4.3. Assumptions and Methods (continued)

➤ Disability

Graduated Rates. See table below for sample values.

Attained Age	Disability
20-24	0.05%
25-29	0.10%
30-34	0.35%
35-39	0.35%
40-44	0.45%
45-49	0.70%
50-54	2.00%
55-59	4.00%
60-64	9.00%

20% of disabilities are assumed to be Non-Duty related and 80% are assumed to be Duty related.

➤ Retirement

Sample Rates Below:

Attained Service	Annual Rate
20*	10%
21*	5%
22	5%
23	5%
24	10%
25-29	15%
30-33	20%
34	25%
35+	100%

* Not applicable for members hired on or after November 1, 2013.

➤ Assumed Age of Commencement of Deferred Benefits

Later of Age 50 and 20 Years of Service for members hired before November 1, 2013 and Age 50 with 22 Years of Service for members hired on or after November 1, 2013.

➤ Marital Status

85% of all participants are assumed to be married at the time benefits commence. Males are assumed to be three years older than their spouses.

4.3 Assumptions and Methods (continued)

➤ Reserve for Guarantee Interest Rate
For DROP Account Balances

For members hired before November 1, 2013, DROP account balances are assumed to earn 2.95% more than the assumed investment return (10.45% currently). The account balances are assumed to be paid out over 10 years for current DROP members and over twenty years for future DROP members.

For members hired on or after November 1, 2013, DROP account balances are assumed to be paid as a lump sum upon termination.

Other Assumptions

Deferred Option Plan

The retirement rates reflect both regular retirement and entry into the DROP. 100% of members retirements with at least 25 years of service are assumed to retroactively elect to enter DROP.

Cost of Living Increase Assumption

Members who retired with twenty years of service prior to May 26, 1983 receive an increase of half of the dollar amount of a 3% assumed increase in base pay. All other members do not receive a cost of living increase.

Provision for Expenses

Administrative expenses, as budgeted by the Oklahoma Firefighters Pension and Retirement System.

Change in Assumptions

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

4.3 Assumptions and Methods (continued)

Volunteer Firefighters

Economic Assumptions

- Funding Policy Interest Rate: 7.50% per year net of investment expenses
- Benefit Level Increases No increases
- Individual Salary Increases Not Applicable

Demographic Assumptions

Mortality:

- Active Employees Pre-Retirement RP-2000 with Blue Collar Healthy Combined with generational mortality improvement using Scale AA.
- Retired Members RP-2000 with Blue Collar Healthy Combined with generational mortality improvement using Scale AA.
- Disabled Members RP-2000 with Blue Collar Healthy Combined.
- Termination Graduated Rates. See table below for sample values.

Attained Service	Termination
0	15.00%
1	16.00%
2	14.00%
3	13.00%
4	11.00%
5-9	0.80%
10-14	5.50%
15+	3.50%

4.3 Assumptions and Methods (continued)

➤ Disability

Graduated Rates. See table below for sample values.

Attained Age	Disability
20-24	0.05%
25-29	0.05%
30-34	0.05%
35-39	0.05%
40-44	0.01%
45-49	0.03%
50-54	0.03%
55-59	0.06%
60-64	2.00%

33% of disabilities are assumed to be Non-Duty related and 67% are assumed to be Duty related.

➤ Retirement

Sample Rates Below:

Attained Service	Annual Rate
20*	30%
21*	15%
22	15%
23	15%
24	25%
25	25%
26-28	15%
29-34	20%
35+	100%

* Not applicable for members hired on or after November 1, 2013.

➤ Assumed Age of Commencement of Deferred Benefits

Later of Age 50 and 20 Years of Service for members hired before November 1, 2013 and Age 50 with 22 Years of Service for members hired on or after November 1, 2013.

➤ Marital Status

85% of all participants are assumed to be married at the time benefits commence. Males are assumed to be three years older than their spouses.

4.3 Assumptions and Methods (continued)

Other Assumptions

Deferred Option Plan

The retirement rates reflect both regular retirement and entry into the DROP.

Cost of Living Increase Assumption

Members are assumed to receive no annual increase in benefits during retirement.

Provision for Expenses

Administrative expenses, as budgeted by the Oklahoma Firefighters Pension and Retirement System.

Change in Assumptions

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

4.3 Assumptions and Methods (continued)

Methods

Valuation Date	July 1, 2018
Asset Valuation Method	An expected actuarial value is determined equal to the prior year's Actuarial Value of Assets (AVA) plus cash flow (excluding investment expenses and realized and unrealized gains and losses) for the year ended on the valuation date and assuming a 7.50% investment return. Twenty percent of any (gain)/loss as measured by the difference between the expected actuarial value and the market value at the valuation date is added to the expected actuarial value plus prior unrecognized gains or losses. The (gain)/loss is amortized over 5 years. The result is constrained to a value of 80% to 120% of the market value of assets.
Cost Methods:	
Funding Policy and GASB 67	The <u>Entry Age Normal Actuarial Cost Method</u> The present value of the projected benefit (PVB) is determined as of the date the member entered the plan (or would have entered if the plan had always been in effect). The present value of future salary (PVFS) is also determined at entry age. The percentage of the PVFS represented by the PVB is the level percent of pay which, if contributed every year, would exactly fund the benefit if the valuation actuarial assumptions were realized. The actuarial accrued liability (AAL) is the theoretical value of assets which would result from the accumulation of these contributions from the plan entry until the valuation date.
Changes in Methods	There have been no changes in the actuarial methods from the prior valuation.

4.4 Plan Provisions

Effective Date	The Plan became effective July 1, 1981 and is regularly amended during legislative session.
Plan Year	July 1 st through June 30 th
Eligibility	All paid and volunteer firefighters of participating municipalities and fire protection districts.
Member Contributions	Paid firefighters contributed 8% of gross salary prior to November 1, 2013. Effective November 1, 2013, paid firefighters contribute 9% of gross salary. No employee contributions are required for volunteer firefighters.
Employer Contributions	Participating municipalities and fire protection districts contributed 13% of gross salary for each paid firefighter and \$60.00 per year for each volunteer firefighter prior to November 1, 2013. Effective November 1, 2013, participating municipalities and fire protection districts contribute 14% of gross salary for each paid firefighter. Municipalities with revenues under \$25,000 make no contribution for volunteer firefighters.
State Contributions	Insurance Premium Tax Allocation. The fund received 34% of these collected taxes prior to November 1, 2013. Effective November 1, 2013, the fund is scheduled to receive 36% of these collected taxes.
Credited Service	<p>The period of membership in the Pension System or a predecessor municipal system. Service for members of a fire protection district does not accrue prior to July 1, 1982.</p> <p>Military service is credited for one term (unless the member is required by law to re-enlist) if the city continues to make contributions on the member's behalf as though he were in actual service, provided that he returns to actual service within the fire department within ninety days of honorable discharge. War veterans shall receive up to five years of credit for military service.</p>

4.4 Plan Provisions (continued)

A member who has withdrawn his 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 withdrawal

A member may receive credit for up to five years of credited service accumulated by the member while a member of the Oklahoma Police Pension and Retirement System, the Oklahoma Law Enforcement Retirement System, the Teachers' Retirement System of Oklahoma, or the Oklahoma Public Employees Retirement System, if the member is not receiving or eligible to receive retirement credit or benefits from said service in any other public retirement system. The cost to buy-back service is determined as the actuarial present value of the benefits attributable to the service, effective January 1, 1991.

Compensation

Compensation includes gross salary excluding overtime, payment for accumulated sick or annual leave upon termination, any uniform allowances or reimbursement of out-of-pocket expenses, but excluding any salary reductions pursuant to Section 457 or Section 414(b) of the Internal Revenue Code. Only salary on which the required contributions have been made may be considered.

Final Average Compensation

Highest 30 consecutive months out of the last 60 months which produce the highest average

Normal Retirement Date

For members hired before November 1, 2013, the first day following the day the member completes twenty years of service, regardless of age. For members hired on or after November 1, 2013, the first day following the day the member completes twenty-two years of service and is 50 years old.

Normal Retirement Benefit

Paid firefighters receive a monthly benefit equal to 50% of final average compensation.

Volunteer firefighters receive \$150.60 per month, effective July 1, 2008.

4.4 Plan Provisions (continued)

Late Retirement Benefit

Benefits continue to accrue for service up to thirty years at the following rates:

Paid firefighters accrue at 2.5% of final average compensation per year of service.

Volunteer firefighters accrue at \$7.53 per month per year of service

Early Retirement Benefit

None

Disability or Death Benefit

All firefighters are eligible for immediate disability or death benefits. Disabilities due to heart disease, injury to the respiratory system, or cancer are considered in the line of duty. If there is no eligible surviving spouse, the death benefit is divided between the children under age 18 or age 22 if children are enrolled as full-time students.

Paid firefighters receive 2.5% of final average compensation per year of service, with a minimum service credit of twenty years and a maximum of thirty years. For disabilities not in the line of duty, final average compensation is based on sixty months instead of thirty months.

Volunteer firefighters receive \$7.53 per month per year of service, with a maximum of thirty years. For disabilities or deaths in the line of duty, there is a minimum service credit of twenty years.

Termination Benefit:

For members hired before November 1, 2013:

A member who terminates after ten years of credited service is eligible for a vested severance benefit determined by the normal retirement formula, based on service and salary history to date of termination.

The benefit is payable at age 50 or when the member would have completed twenty years of service, whichever is later, provided the member's contribution accumulate is not withdrawn.

Members terminating with less than ten years of credited service receive a refund of their contribution accumulation without interest.

4.4 Plan Provisions (continued)

Termination Benefit (continued):

For members hired on or after November 1, 2013:

A member who terminates after eleven years of credited service is eligible for a vested severance benefit determined by the normal retirement formula, based on service and salary history to date of termination.

The benefit is payable at age 50 or when the member would have completed twenty-two years of service, whichever is later, provided the member's contribution accumulate is not withdrawn.

Members terminating with less than eleven years of credited service receive a refund of their contribution accumulation without interest.

Lump Sum Death Benefit

Upon death of an active or retired member on or after July 1, 1999, a \$5,000 lump sum death benefit will be paid to the member's beneficiary, or estate if no beneficiary. The \$5,000 death benefit does not apply to members electing vested termination benefit.

Normal Forms of Payment

A Joint and 100% Survivor Annuity if the firefighter is married thirty months prior to death.

Post-Retirement Adjustments

Firefighters with twenty years of service as of May 26, 1983, are entitled to post-retirement adjustments equal to one-half the increase or decrease for top step firefighters. Pensions will not be adjusted below the level at which the firefighter retired.

Deferred Option Plan

A member who is eligible to receive a Normal Retirement Benefit and continues employment may elect to participate in the Deferred Option Plan (DROP). Participation in the DROP shall not exceed five years. The employees' contributions cease upon entering the Plan, but the employer contributions are divided equally between the Retirement System and DROP. The monthly retirement benefits that the employee is eligible to receive are paid into the DROP account.

4.4 Plan Provisions (continued)

Deferred Option Plan (continued)

A member is allowed to retroactively elect to join the DROP as of a back-drop-date which is no earlier than the member's Normal Retirement Date or five years before his termination date. The monthly retirement benefits and employee contributions that would have been payable had the member elected to join the DROP are credited to the member's DROP account with interest.

The retirement benefits are not recalculated for service and salary past the election date to join DROP. However, the benefits may be increased by any applicable cost-of-living increases.

When the member actually terminates employment, the DROP account balance may be paid in a lump sum or as an annuity or any method approved by the Board. Currently the Board's approval method requires at a minimum that interest earnings shall be withdrawn each year. Monthly retirement benefits are then paid directly to the retired member.

For members hired before November 1, 2013, the DROP account is guaranteed a minimum of the valuation interest rate for investment return, or 2% less than the fund rate of return, if greater.

For members hired on or after November 1, 2013, the DROP account is guaranteed a minimum of the valuation interest rate for investment return, or 2% less than the fund rate of return, if greater, while in active DROP. The DROP account is credited with 1% less than the fund rate of return once the member leaves active DROP.

On December 15, 2017, the Board adopted a plan change to require that once a member leaves active DROP, they must receive a distribution each year of any interest earned on the DROP account during the year.

Changes in Plan Provisions

The plan was amended to require members who leave the active DROP to receive a payment of at least the interest earned on the DROP account each year. There have been no other changes in the plan since the prior valuation.