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Police and Fire Retirement System of Wichita, Kansas

Actuarial Valuation as of December 31, 2018

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TABLE OF CONTENTS

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April 5, 2019

The Board of Trustees
Police and Fire Retirement System of Wichita, Kansas
City Hall, 12th Floor
455 N. Main Street
Wichita, KS 67202

Dear Members of the Board:

In accordance with your request, we have completed an actuarial valuation of the Police and Fire Retirement System of Wichita, Kansas as of December 31, 2018. The major findings of the valuation are contained in this report, including the employer contribution rate for fiscal year 2020. The plan provisions and the actuarial methods are the same as the prior valuation. However, the December 31, 2018 valuation reflects a different set of assumptions, adopted by the Board as a result of the completion as a result of an experience study. The new assumptions, which are first used to develop the funded status and actuarial contribution rate in the December 31, 2018 valuation, resulted in an increase in the unfunded actuarial liability, a decrease in the normal cost rate and a decrease in the actuarial contribution rate.

While reviewing the valuation programming this year, we determined that the commencement of post-retirement adjustments for future members assumed to elect the BackDROP were not consistent with plan provisions which include a post-retirement adjustment that begins 36 months after retirement. For members who elect a BackDROP, the 36 month waiting period for the COLA begins on their BackDROP date. The programming in the valuation delayed the adjustment to 36 months after the date the member left employment rather than from the BackDROP date. As a result of the programming change, the actuarial liability, normal cost rate, and total actuarial contribution rate increased.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, plan provisions, member data, and financial information. We found this information to be reasonably consistent and comparable with information for the last valuation. The valuation results depend on the integrity of the data provided. If any of this information is inaccurate or incomplete, our valuation results may be different and our calculations may need to be revised.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the 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 System's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

Actuarial computations presented in this report are for purposes of determining the actuarial contribution rates for funding the System which have been made on a basis consistent with our understanding of the System's funding policy and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes. For example, actuarial computations for purposes of fulfilling financial accounting requirements for the System under Governmental Accounting Standards No. 67 and No. 68 are provided in a separate report.

The consultants who worked on this assignment are pension actuaries. CMC's advice is not intended to be a substitute for qualified legal or accounting counsel.

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 plans, 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 plan and on actuarial assumptions that we believe are internally consistent and reasonably based on the actual experience of the System. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix C.

We respectfully submit the following report and look forward to discussing it with the Board.

Sincerely,

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

Brent A. Banister, PhD, FSA, EA, FCA, MAAA
Chief Actuary

SECTION I: EXECUTIVE SUMMARY

This report presents the results of the December 31, 2018 actuarial valuation of the Police and Fire Retirement System of Wichita, Kansas. The primary purposes of performing a valuation are to:

- estimate the liabilities for the benefits provided by the System;
- determine the employer contribution rate required to fund the System on an actuarial basis;
- disclose certain asset and liability measures as of the valuation date;
- assess and disclose the key risks associated with funding the System;
- monitor any deviation between actual plan experience and experience projected by the actuarial assumptions, so that recommendations for assumption changes can be made when appropriate; and
- analyze and report on any significant trends in contributions, assets and liabilities over the past several years.

A new Actuarial Standard of Practice (ASOP) is applicable for the December 31, 2018 valuation report. In order to help plan sponsors better understand the risks associated with funding pension plans (future measurements varying from expected results because actual experience is different than actuarial assumptions), ASOP 51 requires the actuary to address and disclose the key risks that may affect the plan's future financial condition. In order to comply with this Standard, Section VI has been added to the valuation report.

As a result of the combination of unfavorable experience (actual unfunded actuarial liability higher than expected based on assumptions) and the assumption changes adopted by the Board last year, the funded status of the System declined and the actuarial contribution rate increased. The funded ratio, based on the actuarial or smoothed value of assets, declined from 95.4% last year to 90.7% in the current valuation and the City's contribution rate increased from 18.9% to 21.9%. Based on the expected payroll from the valuation results, the dollar amount of the increase in the City's contribution for 2020 is estimated at around $2.3 million.

There have been several changes to the actuarial assumptions used in this valuation as a result of the experience study completed in April, 2018. All of the recommended changes from the experience study were adopted by the Board of Trustees and are first used in this valuation. They include:

- Decreasing in the price inflation assumption from 3.25% to 2.75%.
- Decreasing in the investment return assumption from 7.75% to 7.50%.
- Decreasing in the general wage growth assumption from 4.00% to 3.25%.
- Decreasing in the payroll growth assumption from 4.00% to 3.25%.
- Decreasing in the indexation of terminated vested benefits from 4.00% to 3.50%.
- Modifying the retirement rates and create a separate assumption for members with more than 30 years of service to better reflect the actual retirement and BackDROP experience.
- Adjusting the termination of employment rates to better reflect the actual experience.
- Adjusting the probability of refund assumptions to better reflect the actual experience.
- Decreasing the merit component of the salary increase assumption.
- Decreasing the sick leave load assumption 3.00% to 2.50%.

The December 31, 2018 valuation results, including the calculation of the actuarial value of assets, were first prepared using the same set of assumptions as were used in the December 31, 2017 valuation (including a 7.75% investment return assumption). The liability results were then recalculated using the new set of assumptions adopted by the Board and contribution rates were determined. Although the changes to the actuarial assumptions increased the actuarial liability by $9.8 million, the normal cost rate decreased as did

the total contribution rate (see table below). The most significant cost impact was due to the change to the investment return assumption. The impact of the assumption changes on the December 31, 2018 valuation results is summarized in the following table ($ millions):

	Previous Assumptions	New Assumptions	Difference
Actuarial Liability (AL)	$752.3	$762.1	$9.8
Actuarial Value of Assets (AVA)	691.0	691.0	0.0
Unfunded AL (UAL)	$ 61.4	$ 71.1	$9.8
Funded Ratio	91.8%	90.7%	(1.1%)
Normal Cost Rate	23.2%	21.7%	(1.5%)
Amortization of UAL	6.2%	7.2%	1.0%
Total Contribution Requirement	29.4%	28.9%	(0.5%)
Member Financed Portion	(7.0%)	(7.0%)	0.0%
City Financed Portion	22.4%	21.9%	(0.5%)

Note: Numbers may not add due to rounding.

While reviewing the valuation programming this year, we determined that the commencement of post-retirement adjustments for future members assumed to elect the BackDROP were not consistent with plan provisions which include a post-retirement adjustment that begins 36 months after retirement. For members who elect a BackDROP, the 36 month waiting period for the COLA begins on their BackDROP date. The programming in the valuation delayed the adjustment to 36 months after the date the member left employment rather than from the BackDROP date. As a result, liabilities were understated by about 1.4%. This change to the programming increased the actuarial liability by $10.6 million and the normal cost rate by 0.50%. As a result, the total actuarial contribution rate increased by 1.8% of pay.

The most significant impact on the valuation results was the net rate of return of approximately -6.5% on the market value of assets compared to the expected return of +7.75% for 2018. Due to the maturity of the System, the size of the assets in comparison to covered payroll is very large (see Table 11). The market value of assets divided by payroll (called the Asset Volatility Ratio) in the December 31, 2018 valuation was 8.80. This means that a "miss" on the return of nearly 15%, as was experienced in calendar year 2018, created an actuarial loss that is about 133% of payroll. Even with the use of an asset smoothing method and amortization of the resulting experience loss over twenty years, the magnitude of such experience has a significantly negative impact on the City's contribution rate. The portion of the investment experience loss recognized in this valuation increased the City's contribution rate by 1.9%.

The actuarial valuation results, which provide a "snapshot" view of the System's financial condition on December 31, 2018, reflect aggregate unfavorable experience for the past plan year largely due to the impact of a net investment return of approximately -6.5% for 2018. Even with the use of an asset smoothing method, the unfunded actuarial liability increased, the funded ratio decreased, and the actuarial contribution rate increased. The change in the programming of the BackDROP further decreased the funded ratio and increased the contribution rate.

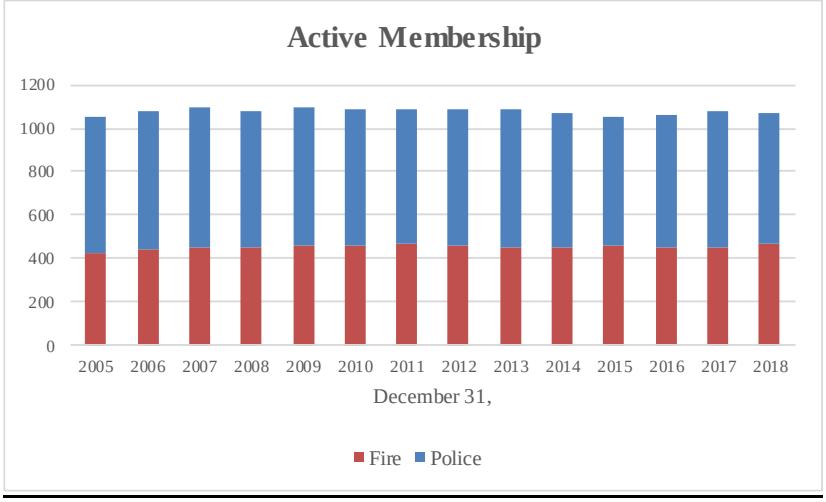
A summary of the current valuation results, compared to the prior year, is shown in the following table (dollar amounts in millions):

	December 31, 2018	2017	Change
Actuarial Liability	$762.1	$710.0	$52.1
Actuarial Assets	691.0	677.6	13.4
Unfunded Actuarial Liability	$71.1	$32.4	$38.7
Funded Ratio			
- Actuarial Value	90.7%	95.4%	(4.7%)
- Market Value	83.2%	98.3%	(15.1%)
City Contribution Rate			
- Normal Cost	14.7%	15.7%	(1.0%)
- Amortization of UAL	7.2%	3.2%	4.0%
- Total	21.9%	18.9%	3.0%

Note the results for the December 31, 2018 valuation reflect the impact of the change in assumptions, the change in programming of the BackDROP, and the unfavorable investment experience recognized in this valuation. In the following pages, changes in the assets, liabilities, and contributions of the System over the last year are discussed in more detail.

MEMBERSHIP

There are 1,067 active members in the current valuation compared to 1,082 in the prior valuation, a 1.4% decrease. The following graph shows the number of active members in the valuation over the last 14 years. The unfunded actuarial liability is funded as a level percent of payroll and an assumption is used to anticipate the amount of future payrolls (currently 3.25%). When the number of active members decreases, the UAL contribution rate is unfavorably impacted by the smaller size of active members and the resulting lower payroll. This creates upward pressure on the contribution rate. The current assumption for total payroll growth of 3.25% is less likely to be met if the size of the active membership declines. The graph also identifies the portion of police and fire members in the total active population. In the current valuation, there were 603 police members and 464 fire members.



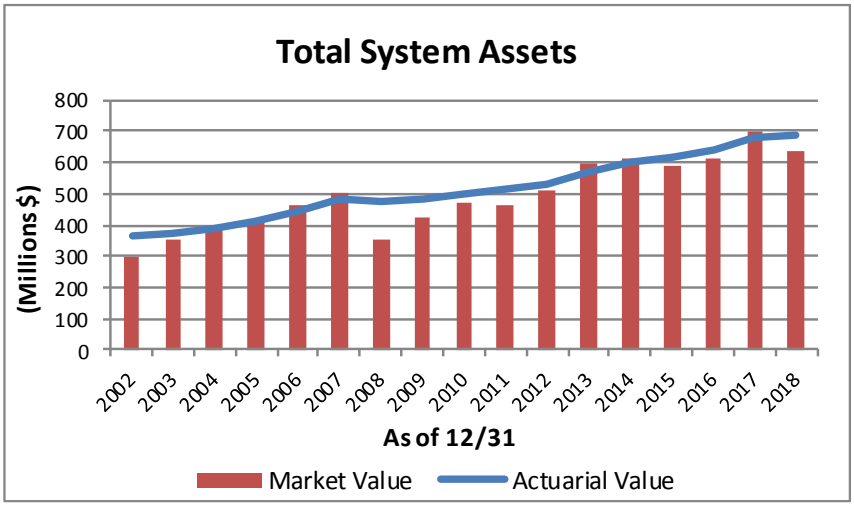
It is important to remember that the valuation results are based on the active membership as of December 31st of each year. To the extent there are unfilled positions on the valuation date or plans to increase the number of active police officers or firefighters in the future (as is the case for the city of Wichita), this change in the size of the active membership is not recognized in the valuation. Such changes will be captured as the actual growth occurs in the future and is then reflected in the data gathered for future valuations.

ASSETS

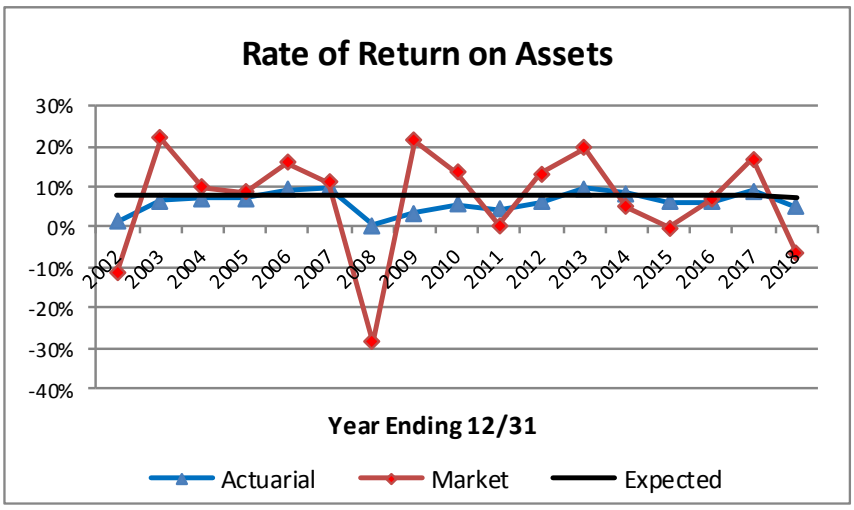
As of December 31, 2018, the System had total assets of $634.1 million when measured on a market value basis. This was a decrease of $64.0 million from the December 31, 2017 figure of $698.1 million. The market value of assets is not used directly in the calculation of the City's contribution rate. An 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". The actuarial value of assets is equal to the expected value (calculated using the actuarial assumed rate of 7.75% for calendar year 2018) plus 25% of the difference between the actual market value and the expected value. See Table 3 for a detailed development of the actuarial value of assets. The net rate of return on the actuarial value of assets was +4.9% which resulted in an actuarial loss since the return fell short of the assumed rate of return. Due to deferred investment experience, the actuarial value of assets exceeds the market value by $56.9 million. In the prior valuation, the market value of assets exceeded the actuarial value.
The components of the change in the market and actuarial value of assets for the System (in millions) are set forth below:

	Market Value ($M)	Actuarial Value ($M)
Assets, December 31, 2017	$698.1	$677.6
- City and Member Contributions	19.9	19.9
- Benefit Payments and Refunds	(39.4)	(39.4)
- Investment Income (net of expenses)	(44.5)	32.9
Assets, December 31, 2018	$634.1	$691.0
Estimated Net Return	(6.5%)	4.9%

The unrecognized investment loss of $57 million represents about 9% of the market value of assets. Unless offset by future investment gains or other favorable experience, the recognition of the deferred loss is expected to have a negative impact on the funded ratio in the future, as well as the actuarial contribution rate. If the deferred loss was recognized immediately (actuarial value of assets set equal to market value), the funded percentage would decrease from 91% to 83% and the actuarially determined contribution rate for the City would increase from 21.9% to 27.6% of payroll.



The actuarial value of assets has both been greater than and less than the market value of assets during this period, which is expected when using a smoothing method.



The rate of return on the actuarial value of assets has been less volatile than the market value return, which is the main reason for using an asset smoothing method.

LIABILITIES

The actuarial liability is that portion of the present value of future benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and asset values at the same date is referred to as the unfunded actuarial liability (UAL), or (surplus) if the asset value exceeds the actuarial liability. The unfunded actuarial liability will be reduced if the employer's contributions exceed the employer's normal cost for the year, after allowing for interest earned on the previous balance of the unfunded actuarial liability. Benefit improvements, experience gains and losses,

and changes in actuarial assumptions and procedures will also impact the total actuarial liability and the unfunded portion thereof.

The Actuarial Liability and Unfunded Actuarial Liability for the System as of December 31, 2018 are:

Actuarial Liability	$762,085,326
Actuarial Value of Assets	690,969,459
Unfunded Actuarial Liability	$ 71,115,867

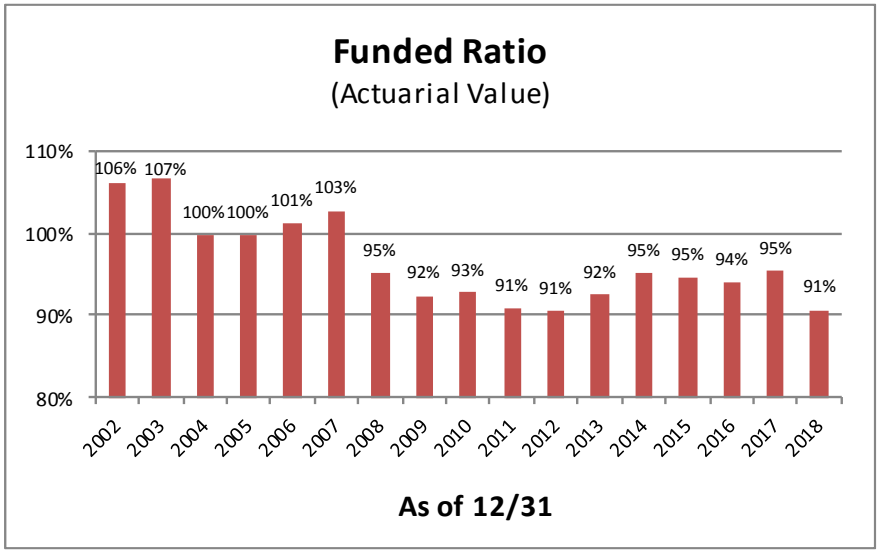
Between December 31, 2017 and December 31, 2018, the change in the unfunded actuarial liability for the System was as follows (in millions):

Change in Unfunded Actuarial Liability	($M)
UAL, December 31, 2017	$32.4
• Expected change in UAL	0.1
• Investment experience	19.0
• Liability experience	1.2
• Assumption changes	9.8
• BackDROP coding revisions	10.6
• Other experience	(2.0)
UAL, December 31, 2018	$71.1

The experience loss for the 2018 plan year of $20.2 million reflects the aggregate impact of an actuarial loss of $19.0 million on System assets (actuarial value) and an actuarial loss of $1.2 million on System liabilities. The actuarial loss on assets was discussed earlier. The actuarial loss on System liabilities was primarily due to unfavorable retirement experience.

Analysis of the unfunded actuarial liability strictly as a dollar amount can be misleading. Another way to evaluate the unfunded actuarial liability and the progress made in its funding is to track the funded status, the ratio of the actuarial value of assets to the actuarial liability. This information for recent years is shown below (in millions). Longer term historical information is shown in the graph following the chart. Note that the funded ratio does not indicate whether or not the System has sufficient funds to settle all current obligations, nor is it necessarily indicative of the need for future funding.

	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018
Actuarial Liability ($M)	$631.9	$655.1	$681.6	$710.0	$762.1
Actuarial Value of Assets ($M)	600.9	620.1	640.5	677.6	691.0
Funded Ratio (Actuarial Value)	95.1%	94.7%	94.0%	95.4%	90.7%
Funded Ratio (Market Value)	96.7%	90.5%	90.1%	98.3%	83.2%



The graph shows that the funded ratio has generally declined over this period due to various reasons including assumption changes, and more significantly, investment experience. However, the System's funded ratio has remained strong (above 90%) even given the impact of the investment returns on the actuarial value of assets that have generally been below the assumed rate since 2008.

As mentioned earlier in this report, due to the asset smoothing method there is currently a $57 million difference between the actuarial value and the market value of assets. To the extent there is not favorable investment experience to offset the deferred loss, it will be recognized in future years and the System's funded status is expected to decrease. The System's funded status will continue to be heavily dependent on future investment experience.

CONTRIBUTION RATES

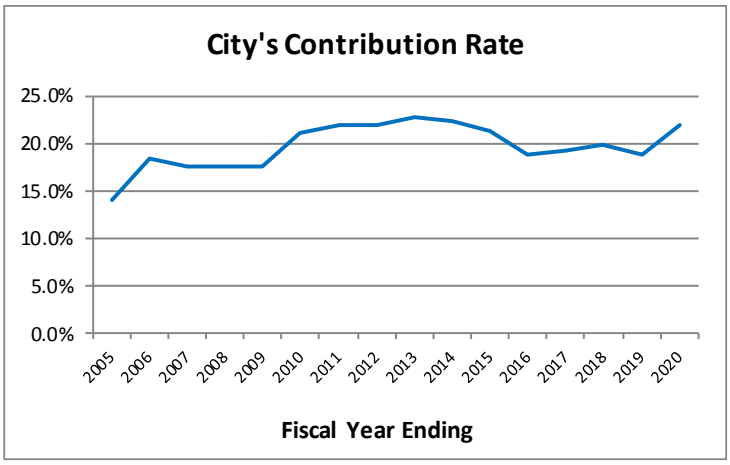
Generally, contributions to the System consist of:

- A "normal cost" for the portion of projected liabilities allocated to service of members during the year following the valuation date by the actuarial cost method, and
- An "unfunded actuarial liability or (surplus) contribution" for the excess of the portion of projected liabilities allocated to service to date over the actuarial value of assets.

Contribution rates are computed with the objective of developing costs that are level as a percentage of covered payroll. The contribution rate for fiscal year 2020 is based on the December 31, 2018 actuarial valuation results.

As of December 31, 2018, the actuarial liability exceeds the actuarial value of assets so an unfunded actuarial liability (UAL) exists. When amortized over a rolling 20-year period, the resulting contribution is 7.2% of pay. The City's contribution rate is the sum of the employer normal cost rate and the UAL amortization contribution. This valuation indicates the City's contribution should be 21.9% of pay (14.7% employer normal cost rate plus 7.2% UAL contribution).

A summary of the City's historical contribution rate is shown below:



After decreasing for FY 2013 through FY 2016, the City's contribution rate rose slightly for FY 2017 and FY 2018 before decreasing for FY 2019 and rising again for FY 2020. The City's contribution rate is 18.9% and 21.9% for the fiscal years ending 12/31/2019 and 12/31/2020, respectively.

COMMENTS

There have been several changes to the actuarial assumptions used in this valuation as a result of the experience study completed in April 2018, the most significant of which was the decrease in the investment return assumption from 7.75% to 7.50%. The changes to the actuarial assumptions increased the actuarial liability by $9.8 million, but decreased the total actuarial required contribution by 0.5% of pay because the normal cost rate declined more than the increase in the UAL contribution rate.

In addition to the change in the actuarial assumptions, there was a programming change to the valuation of benefits for future members assumed to elect the BackDROP. While reviewing the valuation programming this year, we determined that the commencement of post-retirement adjustments for future members assumed to elect the BackDROP were not consistent with plan provisions. The benefit provisions include a post-retirement adjustment that begins 36 months after retirement. For members who elect a BackDROP, the 36 month waiting period for the COLA begins on their BackDROP date. The programming in the valuation delayed the adjustment to 36 months from the date the member left employment rather than from the BackDROP date. As a result, liabilities were understated by about 1.4%. This change to the programming increased the actuarial liability by $10.6 million and the normal cost rate by 0.50%. As a result, the total actuarial contribution rate increased by 1.8% of pay.

The System does not use the actual market value of assets in developing the actuarial contribution rate, but utilizes an asset valuation method to smooth out the peaks and valleys in investment returns from year to year. Under the asset valuation method, the actuarial value of assets is determined as 75% of the expected value (using the actuarial assumed rate of return) and 25% of the actual market value. The net return on the market value of assets for 2018 was approximately -6.5%. However, due to deferred asset gains the return on the actuarial value of assets was +4.9%. Because the return on the actuarial value of assets is less than the assumed rate of return (7.75% during 2018), the System experienced an actuarial loss on assets of $19.0 million. This loss and the actuarial loss on liabilities of $1.2 million resulted in a net actuarial loss of $20.2 million.

The actuarial loss resulting from the unfavorable investment experience for the year ending December 31, 2018, along with the change to the BackDROP programming, increased the City's contribution rate from

18.9% in the December 31, 2017 valuation to 21.9% in the current valuation. The actuarial contribution rate for the City has been, and will continue to be, heavily impacted by investment returns from year to year. Investment performance that is different from the 7.50% assumption will create volatility in the City's contribution rate due to the size of the system assets compared to covered payroll (see Section VI). Given the expected volatility associated with the System's portfolio, which is measured by the standard deviation, actual returns that vary by 10% to 12% from the assumed rate of return in one year are not unexpected. Even with asset smoothing and amortization of the actuarial loss recognized in the first year over 20 years, such variation in the investment experience would impact the City's contribution rate by around 1.75% of payroll. This illustrates the contribution risk related to actual investment returns that are different than expected.

The deferred investment loss (actuarial value greater than market value of assets) is $56.9 million as of December 31, 2018. Absent investment gains in future years, the deferred investment loss of $56.9 million will eventually be reflected in the actuarial value of assets in future years. While the use of an asset smoothing method is a common procedure for public retirement systems, it is important to identify the potential impact of the deferred investment experience. This is accomplished by comparing the key valuation results from the December 31, 2018 actuarial valuation using both the actuarial and market value of assets (see following table).

	Using Actuarial Value of Assets	Using Market Value of Assets
Actuarial Liability	$762,085,326	$762,085,326
Asset Value	690,969,459	634,054,617
Unfunded Actuarial Liability	71,115,867	128,030,709
Funded Ratio	90.7%	83.2%
Normal Cost Rate	21.7%	21.7%
UAL Contribution Rate	7.2%	12.9%
Total Contribution Rate	28.9%	34.6%
Employee Contribution Rate	(7.0%)	(7.0%)
Employer Contribution Rate	21.9%	27.6%

Note that the funded ratio does not indicate whether or not the System has sufficient funds to settle all current obligations, nor is it necessarily indicative of the need for future funding.

A typical retirement plan faces many different risks. The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. Actuarial Standard of Practice Number 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions. Risk evaluation is an important part of managing a defined benefit plan. Please see Section VI of this report for an in-depth discussion of the specific risks facing the Police and Fire Retirement System of Wichita, Kansas.

SUMMARY OF PRINCIPAL RESULTS

	12/31/2018 Valuation	12/31/2017 Valuation	% Change
1. PARTICIPANT DATA			
Number of:			
Active Members			
Police	603	630	(4.3%)
Fire	464	452	2.7%
Total	1,067	1,082	(1.4%)
Retired Members and Beneficiaries	1,015	1,000	1.5%
Inactive Vested Members	39	33	18.2%
Inactive Non-Vested Members	8	0	N/A
Total Members	2,129	2,115	0.7%
Annual Projected Payroll			
Police	$ 43,612,451	$ 44,518,765	(2.0%)
Fire	29,687,113	28,289,307	4.9%
Total	$ 73,299,564	$ 72,808,072	0.7%
Annual Projected Payments for Retired Members and Beneficiaries	$ 35,386,980	$ 33,526,716	5.5%
2. ASSETS AND LIABILITIES			
Total Actuarial Liability	$ 762,085,326	$ 710,017,157	7.3%
Market Value of Assets	634,054,617	698,083,949	(9.2%)
Actuarial Value of Assets	690,969,459	677,616,328	2.0%
Unfunded Actuarial Liability	$ 71,115,867	$ 32,400,829	119.5%
Funded Ratio	90.7%	95.4%	(4.9%)
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost	21.7%	22.7%	(4.4%)
Member Financed	(7.0%)	(7.0%)	0.0%
Employer Normal Cost	14.7%	15.7%	(6.4%)
Amortization of Unfunded Actuarial Liability or (Surplus)	7.2%	3.2%	125.0%
Employer Contribution Rate	21.9%	18.9%	15.9%

SECTION II: SCOPE OF THE REPORT

This report presents the actuarial valuation of the Police and Fire Retirement System of Wichita, Kansas as of December 31, 2018. This valuation was prepared at the request of the System's Board of Trustees. The report is based on plan provisions, actuarial assumptions and actuarial methods that are unchanged from last year.

Please pay particular attention to our cover letter, where the guidelines employed in the preparation of this report are outlined. We also comment on the sources and reliability of both the data and the actuarial assumptions upon which our findings are based. Those comments are the basis for our certification that this report is complete and accurate to the best of our knowledge and belief.

A summary of the findings resulting from this valuation is presented in the previous section. Section III describes the assets and investment experience of the System. Sections IV and V describe how the obligations of the System are to be met under the actuarial cost method in use. Section VI discloses key maturity measurements and discusses the key risks facing the funding of the System. Section VII includes additional information regarding the System's funding history.

This report includes several appendices:

- Appendix A Schedules of valuation data classified by various categories of members.
- Appendix B A summary of the current benefit structure, as determined by the provisions of governing law on the valuation date.
- Appendix C A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix D A glossary of actuarial terms.

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 December 31, 2018. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System. The actuarial process then leads to a method of determining the contributions needed by members and the employer in the future to balance the System assets and liabilities.

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, the market value of assets provides a basis for measuring investment performance from time to time. On December 31, 2018, the market value of assets for the System was $634.1 million. Table 1 shows the System assets as of December 31, 2018 in total and by investment category. Table 2 summarizes the change in the market value of assets from December 31, 2017 to December 31, 2018.

ACTUARIAL VALUE OF ASSETS

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

To arrive at a suitable value for the actuarial valuation, a technique for determining the actuarial value of assets is used which dampens swings in the market value while still indirectly recognizing market values. This methodology, first adopted for the December 31, 2002 valuation, smoothes market experience by recognizing 25% of the difference between the expected value (based on the actuarial assumption) and the actual market value. Table 3 shows the development of the actuarial value of assets (AVA) as of December 31, 2018.

TABLE 1

Analysis of Net Assets at Market Value

	As of December 31, 2018			As of December 31, 2017		
	Amount ($ Millions)	% of Total		Amount ($ Millions)	% of Total	
Cash and Equivalents	$ 0.1	0.0	%	$ 0.0	0.2	%
Government Securities	8.2	1.3		5.2	0.7	
Fixed Income	135.7	21.4		111.2	15.9	
Domestic Equity	236.7	37.3		300.4	43.0	
International Equity	158.4	25.0		192.1	27.5	
Real Estate	48.4	7.6		41.4	5.9	
Timber	30.1	4.7		28.0	4.0	
Commodities	18.1	2.9		19.3	2.8	
Receivables	0.4	0.1		1.0	0.1	
Liabilities	(1.9)	(0.3)		(0.7)	(0.1)	
Total	$ 634.1	100.0	%	$ 698.0	100.0	%

** Numbers may not add due to rounding.*

TABLE 2

Summary of Changes in Net Assets
During Year Ended December 31, 2018

(Market Value)

1. Market Value of Assets as of December 31, 2017	$	698,083,949
2. Adjustment to Tie to Audited Financial Statements	$	0
3. Contributions:		
a. Members	$	5,599,216
b. City		14,331,422
c. Total	$	19,930,638
4. Investment Income:		
a. Interest and Dividends	$	9,950,035
b. Net Appreciation (Depreciation) in Fair Value		(50,382,065)
c. Commission Recapture		16,399
d. Net Securities Lending Income		66,830
e. Investment Expenses		(3,639,570)
f. Net Investment Income (Loss)	$	(43,988,371)
5. Expenditures:		
a. Refunds of Member Contributions	$	261,073
b. Benefits Paid:		
(1) Pension and Death Benefits		34,283,760
(2) BackDROP Payments		4,836,668
c. Administrative Expenses		590,098
d. Total	$	39,971,599
6. Net Change [3(c) + 4(f) - 5(d)]	$	(64,029,332)
7. Market Value of Assets as of December 31, 2018 [(1) + (2) + (6)]	$	634,054,617

TABLE 3

Development of Actuarial Value of Assets
as of December 31, 2018

1. Actuarial Value of Assets as of December 31, 2017	$	677,616,328
2. Actual Contributions/Disbursements		
a. Contributions	$	19,930,638
b. Benefit Payments and Refunds		(39,381,501)
c. Net	$	(19,450,863)
3. Expected Value of Assets as of December 31, 2018 [(1) * 1.0775] + [2(c) * $(1.0775)^{.5}$]	$	709,941,073
4. Market Value of Assets as of December 31, 2018	$	634,054,617
5. Difference Between Actual and Expected Values	$	(75,886,456)
6. Initial Actuarial Value of Assets (3) + [(5) * 0.25]	$	690,969,459
7. Corridor for Actuarial Value of Assets		
a. 80% of Market Value of Assets	$	507,243,694
b. 120% of Market Value of Assets		760,865,540
8. Actuarial Value of Assets as of December 31, 2018	$	690,969,459
9. Actuarial Value of Assets Divided by Market Value of Assets		109.0%
10. Market Value of Assets Minus Actuarial Value of Assets	$	(56,914,842)

SECTION IV: SYSTEM LIABILITIES

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 valuation date, December 31, 2018. 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 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 the measurement of both benefits already earned and future benefits to be earned. For all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and for the lives of the surviving beneficiaries.

All liabilities reflect the benefit provisions in place as of December 31, 2018.

ACTUARIAL LIABILITY

A fundamental principle in financing the liabilities of a prefunded 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 "breakdown" 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 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 liability of the System. The Entry Age Normal actuarial cost method is used to develop the actuarial liability.

TABLE 4

Present Value of Future Benefits (PVFB)
as of December 31, 2018

	Plans A and B	Plan C	Total
1. Active Employees			
a. Retirement Benefit	$ 2,100,813	$ 410,103,793	$ 412,204,606
b. Pre-Retirement Death Benefit	0	4,935,701	4,935,701
c. Withdrawal Benefit	0	13,064,200	13,064,200
d. Disability Benefit	0	48,825,134	48,825,134
e. Total	$ 2,100,813	$ 476,928,828	$ 479,029,641
2. Inactive Vested Members	$ 0	$ 12,297,118	$ 12,297,118
3. Inactive Nonvested Members	$ 0	$ 114,948	$ 114,948
4. In Pay Members			
a. Retirees	$ 137,941,962	$ 182,415,971	$ 320,357,933
b. Disabled Members	14,357,317	43,890,079	58,247,396
c. Beneficiaries	25,276,650	8,799,207	34,075,857
d. Total	$ 177,575,929	$ 235,105,257	$ 412,681,186
5. Total Present Value of Future Benefits 1(e) + 2 + 3 + 4(d)	$ 179,676,742	$ 724,446,151	$ 904,122,893

TABLE 5

Actuarial Liability
as of December 31, 2018

	Plans A and B	Plan C	Total
1. Active Employees			
a. Present Value of Future Benefits	$ 2,100,813	$ 476,928,828	$ 479,029,641
b. Present Value of Future Normal Costs	0	142,037,567	142,037,567
c. Actuarial Liability 1(a) - 1(b)	$ 2,100,813	$ 334,891,261	$ 336,992,074
2. Inactive Vested Members	$ 0	$ 12,297,118	$ 12,297,118
3. Inactive Nonvested Members	$ 0	$ 114,948	$ 114,948
4. In Pay Members			
a. Retirees	$ 137,941,962	$ 182,415,971	$ 320,357,933
b. Disabled Members	14,357,317	43,890,079	58,247,396
c. Beneficiaries	25,276,650	8,799,207	34,075,857
d. Total	$ 177,575,929	$ 235,105,257	$ 412,681,186
5. Total Actuarial Liability 1(c) + 2 + 3 + 4(d)	$ 179,676,742	$ 582,408,584	$ 762,085,326

The previous two sections were devoted to a discussion of the assets and liabilities of the System. A comparison of Tables 3 and 4 indicates that current assets fall short of meeting the present value of future benefits (total liability). This is expected in all but a completely closed plan, where no further contributions are anticipated. In an active system, there will almost always be a difference between the actuarial value of assets and total liabilities. This deficiency has to be made up by future contributions and investment returns. An actuarial valuation sets out a schedule of future contributions that will deal with this deficiency 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 rate and (2) the unfunded actuarial liability contribution rate.

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 or because of actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial liability (UAL) exists. Likewise, when the actuarial value of assets is greater than the actuarial liability, a surplus exists.

DESCRIPTION OF CONTRIBUTION RATE COMPONENTS

The Entry Age Normal (EAN) actuarial cost method is used for the valuation. Under this method, the normal cost for each year from entry age to assumed exit age is a constant percentage of the member's year by year projected compensation. The portion of the present value of future benefits not provided by the present value of future normal costs is the actuarial liability. The unfunded actuarial liability/(surplus) represents the difference between the actuarial liability and the actuarial value of assets as of the valuation date. The unfunded actuarial liability is calculated each year and reflects experience gains/(losses).

In general, contributions are computed in accordance with a level percent-of-payroll funding objective. The contribution rates based on this December 31, 2018 actuarial valuation will be used to determine the employer contribution rate to the Police and Fire Retirement System of Wichita, Kansas for fiscal year 2020. In this context, the term "contribution rate" means the percentage, which is applied to a particular active member payroll to determine the actual employer contribution amount (i.e., in dollars) for the group.

As of December 31, 2018, the valuation assets were less than the actuarial liability so an unfunded actuarial liability exists. The City's funding policy is to amortize the UAL over a open (rolling) 20-year period. The amortization of the UAL results in an employer contribution that is more than the employer normal cost rate. The open amortization period means the UAL is not expected to be fully funded in the future, even if all actuarial assumptions are met.

CONTRIBUTION RATE SUMMARY

In Table 6, the amortization payment related to the unfunded actuarial liability/(surplus), as of December 31, 2018, is developed. Table 7 develops the normal cost rate for the System. The derivation of the total contribution rate for the City is shown in Table 8. Table 9 shows the historical summary of the City's contribution rates. Table 10 develops the experience gain/(loss) for the year ended December 31, 2018.

The rates shown in this report are based on the actuarial assumptions and cost methods described in Appendix C.

TABLE 6

Derivation of Unfunded Actuarial Liability Contribution Rate

1. Actuarial Liability	$	762,085,326
2. Actuarial Value of Assets	$	690,969,459
3. Unfunded Actuarial Liability	$	71,115,867
4. Payment (Adjusted to Mid-Year) to Amortize Unfunded Actuarial Liability Over 20 Years*	$	5,264,786
5. Total Projected Payroll for the Year	$	73,299,564
6. Amortization Payment as a Percent of Payroll		7.2%

** The UAL is amortized as a level percent of payroll over a rolling 20-year period.*

TABLE 7

Derivation of Normal Cost Rate

Normal Cost as of December 31, 2018		
Service Pensions	$	10,336,171
Disability Pensions		2,932,372
Survivor Pensions		313,911
Termination Benefits		1,000,758
Total Normal Cost	$	14,583,212
Expected Payroll in 2019 for Current Actives	$	67,063,248
Total Normal Cost Rate for Year		21.7%

TABLE 8

Employer Contribution Rates for Fiscal Year Commencing in 2020

	Contribution Requirement as a % of Payroll
Normal Cost	
Service pensions	15.3 %
Disability pensions	4.4 %
Survivor pensions	0.5 %
Termination pensions	1.5 %
Total Normal Cost	21.7 %
Unfunded Actuarial Liability	
Retired members and beneficiaries [1]	0.0 %
Active and former members [2]	7.2 %
Total UAL Contribution	7.2 %
Total Contribution Requirement	
Member Financed Portion[3]	7.0 %
City Financed Portion	21.9 %
Total	28.9 %

[1] *Actuarial liability for retired members and beneficiaries was fully funded as of December 31, 2018.*

[2] *The excess of the actuarial liability over actuarial value of assets is amortized as a level percent of active member payroll over a rolling 20-year period.*

[3] *The weighted average of member contribution rates: 8.0% for Plan A and 7.0% for Plan C.*

TABLE 9

Historical Summary of City Contribution Rates

Contribution rates are computed in accordance with a level percent of payroll funding objective. As of December 31, 2018, the actuarial value of assets is less than actuarial liabilities resulting in an unfunded actuarial liability (UAL). The UAL is amortized over a rolling 20-year period.

		City Contributions as Percents of Active Member Pensionable Payroll	
Valuation Date	Fiscal Year	Funding Objective	Amortization (Credit)/Payment
11/30/1992	1994	23.3%	0.0%
11/30/1993	1995	22.7	0.0
11/30/1994	1996	22.6	0.0
12/31/1995	1997	18.3[1]	0.0
12/31/1996	1998	17.5	0.0
12/31/1997	1999	15.2 - 15.9	(0.7)
12/31/1998	2000	12.3 - 15.9	(3.6)
12/31/1999[2]	2001	9.6 - 16.8	(7.2)
12/31/2000	2002	8.2 - 16.8	(8.7)
12/31/2001	2003	10.0 - 16.8	(6.8)
12/31/2002	2004	14.0 - 17.0	(3.0)
12/31/2003	2005	13.6 - 17.0	(3.4)
12/31/2004[3]	2006	18.4	0.1
12/31/2005	2007	17.5	0.2
12/31/2006	2008	16.8 - 17.5	(0.7)
12/31/2007	2009	16.0 - 17.5	(1.5)
12/31/2008	2010	20.8	2.7
12/31/2009[4]	2011	22.0	4.3
12/31/2010	2012	22.0	4.2
12/31/2011	2013	22.8	5.6
12/31/2012	2014	22.4	5.9
12/31/2013	2015	21.3	4.8
12/31/2014[4]	2016	18.8	3.3
12/31/2015	2017	19.2	3.6
12/31/2016	2018	19.9	4.2
12/31/2017	2019	18.9	3.2
12/31/2018[4]	2020	21.9	7.2

[1] *Reflects allocation of assets to fully fund retired life liabilities.*

[2] *Includes benefit provision and assumption changes and 1% decrease in member contribution rate.*

[3] *Reflects assumption changes and elimination of surplus assets.*

[4] *Reflects assumption changes.*

TABLE 10

Derivation of System Experience Gain/(Loss)

Liabilities		
1. Actuarial liability as of December 31, 2017	$	710,017,157
2. Normal cost as of December 31, 2017		15,122,089
3. Interest at 7.75% on (1) and (2) to December 31, 2018		56,198,292
4. Benefit payments during 2018		(39,381,501)
5. Interest on benefit payments		(1,497,559)
6. Assumption changes		9,765,715
7. BackDROP coding revisions		10,633,465
8. Expected actuarial liability as of December 31, 2018	$	760,857,658
9. Actuarial liability as of December 31, 2018	$	762,085,326
Assets		
10. Actuarial value of assets as of January 1, 2018	$	677,616,328
11. Contributions during 2018		19,930,638
12. Benefit payments during 2018		(39,381,501)
13. Interest on items (10), (11) and (12)		51,775,608
14. Expected actuarial value of assets as of December 31, 2018	$	709,941,073
15. Actual actuarial value of assets as of December 31, 2018	$	690,969,459
Gain / (Loss)		
16. Expected unfunded actuarial liability (8) – (14)	$	50,916,585
17. Actual unfunded actuarial liability (9) – (15)	$	71,115,867
18. Actuarial Gain / (Loss) (16) – (17)	$	(20,199,282)
19. Actuarial Gain / (Loss) on Actuarial Assets (15) – (14)	$	(18,971,614)
20. Actuarial Gain / (Loss) on Actuarial Liability (8) – (9)	$	(1,227,668)

SECTION VI

RISK CONSIDERATIONS

Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017, Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, is first applicable for the December 31, 2018 actuarial valuation for the Police and Fire Retirement System of Wichita, Kansas (System).

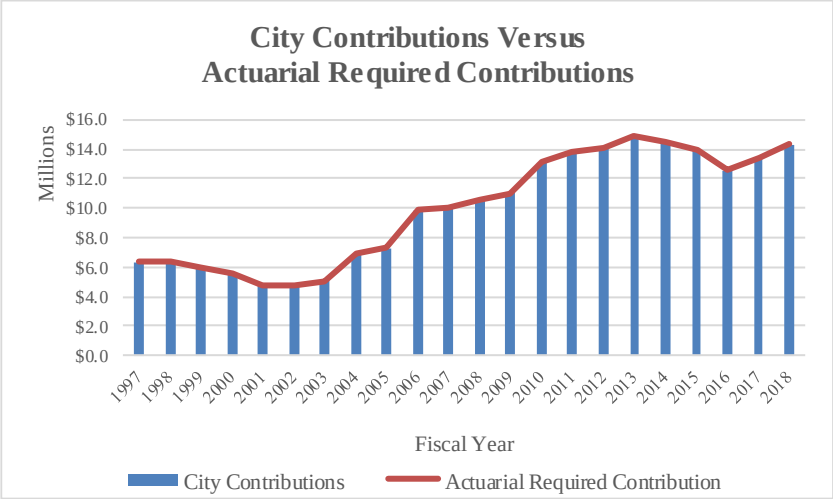
A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. If plan assets are depleted, benefits may not be paid which could create legal and litigation risk or the plan could become "pay as you go". The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates.

There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay and
- external risks such as the regulatory and political environment.

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. The Wichita city ordinance requires the City to contribute the full actuarial contribution rate each year. As the following graph shows, the City has met this requirement in each of the past 22 years.



One of the strongest factors regarding the funding of the System is the City's commitment to make contributions that are at least equal to the actuarial required contribution. The City of Wichita has illustrated its commitment to funding the System by consistently contributing the actuarial required contribution amount.

The most significant risk factor for the Police and Fire Retirement System of Wichita, Kansas is investment return because of the volatility of returns and the size of plan assets compared to payroll (see Table 11). A perusal of historical returns over 10-20 years reveals that the actual return each year is rarely close to the average return for the same period. This is to be expected, given the underlying capital market assumptions and the System's asset allocation.

A key demographic risk for all retirement systems, including the Police and Fire Retirement System of Wichita, Kansas, is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect small, continuous improvements in mortality experience over time and these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, which would also be significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.

Finally, the unfunded actuarial liability is amortized as a level percentage of payroll. The underlying assumption used in developing the payment schedule assumes an increasing payroll over time which is dependent on a stable employment level, i.e., active member count remains the same. When payroll does not grow as expected, the UAL contribution rate will be higher than expected even if the dollar amount of the payment is the same as scheduled.

The following exhibits summarize some historical information that helps indicate how certain key risk metrics have changed over time. Many are due to the maturing of the retirement system.

TABLE 11

Historical Asset Volatility Ratios

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions.

Actuarial Valuation Date	Market Value of Assets	Covered Payroll	Asset Volatility Ratio	Increase in ACR with a Return 10% Lower than Assumed*
12/31/2006	$460,758,908	$53,530,087	8.61	6.37%
12/31/2007	503,915,248	57,310,017	8.79	6.51%
12/31/2008	356,056,234	60,282,291	5.91	4.38%
12/31/2009	422,379,231	63,054,583	6.70	4.96%
12/31/2010	467,487,721	63,076,846	7.41	5.49%
12/31/2011	460,840,745	62,758,545	7.34	5.43%
12/31/2012	511,488,454	64,150,064	7.97	5.90%
12/31/2013	598,458,793	65,305,763	9.16	6.78%
12/31/2014	611,087,051	64,572,237	9.46	7.00%
12/31/2015	592,883,226	65,560,465	9.04	6.69%
12/31/2016	614,047,281	66,946,250	9.17	6.79%
12/31/2017	698,083,949	69,634,297	10.03	7.43%
12/31/2018	634,054,617	72,017,196	8.80	6.51%

Note: Years prior to 12/31/2012 were provided by prior actuary.

*The impact of asset smoothing is not reflected in the impact on the Actuarial Contribution Rate (ACR). Current year assumptions are used for all years shown.

The assets at December 31, 2018 are 880% of payroll so underperforming the investment return assumption by 1.00% (i.e., earn 6.50% for one year) is equivalent to 8.80% of payroll. While the actual impact in the first year is mitigated by the asset smoothing method and amortization of the UAL, this illustrates the risk associated with volatile investment returns.

TABLE 12

Historical Cash Flows

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 5% of MVA that may cause significant concerns. WPF has had negative cash flows of 3% for the last five years and is projected to remain there. The strong funded ratio and the maturity of the system contribute to the situation.

Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments and Expenses	Net Cash Flow	Net Cash Flow as a Percent of MVA
12/31/2005	$406,745,584	$10,961,264	$18,991,425	($8,030,161)	(1.97%)
12/31/2006	460,758,908	13,639,279	19,522,996	(5,883,717)	(1.28%)
12/31/2007	503,915,248	14,085,275	20,063,349	(5,978,074)	(1.19%)
12/31/2008	356,056,234	14,826,648	21,998,918	(7,172,270)	(2.01%)
12/31/2009	422,379,231	15,478,076	24,655,449	(9,177,373)	(2.17%)
12/31/2010	467,487,721	17,587,967	27,443,175	(9,855,208)	(2.11%)
12/31/2011	460,840,745	18,210,305	27,261,380	(9,051,075)	(1.96%)
12/31/2012	511,488,454	18,656,537	28,565,680	(9,909,143)	(1.94%)
12/31/2013	598,458,793	19,497,405	31,961,910	(12,464,505)	(2.08%)
12/31/2014	611,087,051	18,994,076	36,893,476	(17,899,400)	(2.93%)
12/31/2015	592,883,226	18,567,710	36,574,013	(18,006,303)	(3.04%)
12/31/2016	614,047,281	17,362,853	36,100,438	(18,737,585)	(3.05%)
12/31/2017	698,083,949	18,285,163	37,485,174	(19,200,011)	(2.75%)
12/31/2018	634,054,617	19,930,638	39,971,599	(20,040,961)	(3.16%)

Note: Years prior to 12/31/2012 were provided by prior actuary.

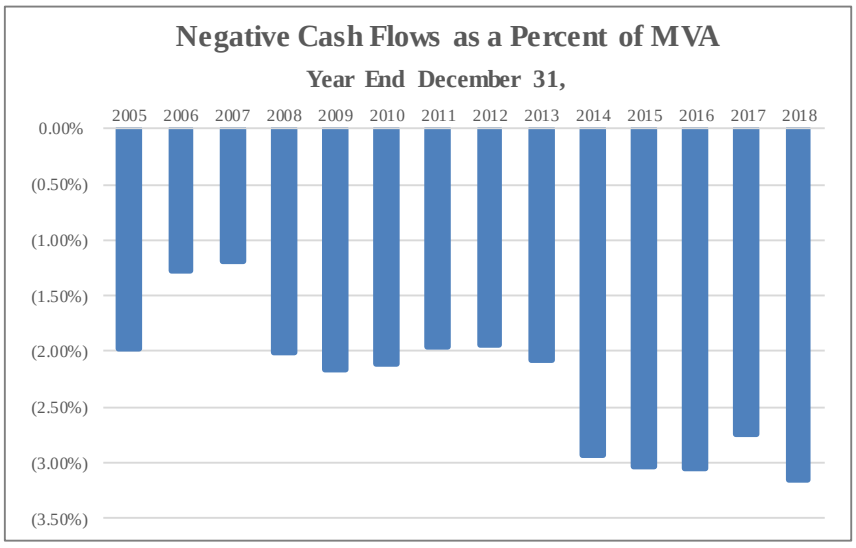


TABLE 13

Liability Maturity Measurements

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members and a growing percentage of retiree liability. The retirement of the remaining baby boomers over the next decade is expected to further exacerbate the aging of the retirement system population. With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the system since it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread costs.

Projections provide the most effective way of analyzing the impact of these changes on future funding measures, but studying several key metrics from the valuation can also provide some valuable insight.

Year End	Retiree Liability (a)	Total Actuarial Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
12/31/2006	$206,919,669	$439,179,132	47.1%	$53,530,087	8.20
12/31/2007	221,397,067	468,114,640	47.3%	57,310,017	8.17
12/31/2008	228,639,223	496,561,146	46.0%	60,282,291	8.24
12/31/2009	247,320,047	519,934,254	47.6%	63,054,583	8.25
12/31/2010	261,533,064	536,908,438	48.7%	63,076,846	8.51
12/31/2011	283,314,447	562,487,887	50.4%	62,758,545	8.96
12/31/2012	295,098,781	589,073,375	50.1%	64,150,064	9.18
12/31/2013	318,225,156	617,748,283	51.5%	65,305,763	9.46
12/31/2014	340,727,696	631,904,401	53.9%	64,572,237	9.79
12/31/2015	355,881,631	655,135,667	54.3%	65,560,465	9.99
12/31/2016	367,788,598	681,644,488	54.0%	66,946,250	10.18
12/31/2017	384,301,754	710,017,157	54.1%	69,634,297	10.20
12/31/2018	412,681,186	762,085,326	54.2%	72,017,196	10.58

Note: Years prior to 12/31/2012 were provided by prior actuary.

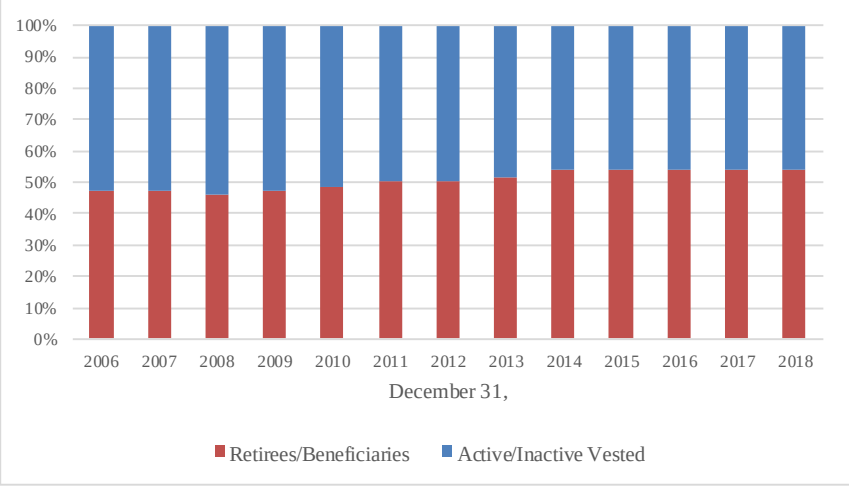


TABLE 14

Historical Member Statistics

Valuation Date	Active Members				Retired Members			
		Payroll	Average Salary			Active/	Average Benefits	
December 31	Number	$ Thousands	$	% Incr.	Number	Retired	$	% Incr.
2004	1,065	$50,414	$47,337		834	1.28	$20,474	
2005	1,051	50,916	48,446	2.3	837	1.26	21,302	4.0
2006	1,081	54,506	50,422	4.1	840	1.29	21,845	2.6
2007	1,092	58,160	53,260	5.6	833	1.31	22,542	3.2
2008	1,076	59,287	55,099	3.5	840	1.28	23,205	2.9
2009	1,100	62,517	56,834	3.1	873	1.26	24,465	5.4
2010	1,089	62,326	57,232	0.7	892	1.22	25,303	3.4
2011	1,088	62,423	57,374	0.2	911	1.19	26,378	4.3
2012	1,084	63,761	58,820	2.5	921	1.18	27,390	3.8
2013	1,085	65,093	59,993	2.0	952	1.14	28,512	4.1
2014	1,068	63,955	59,883	(0.2)	971	1.10	30,037	5.3
2015	1,050	64,550	61,476	2.7	989	1.06	31,117	3.6
2016	1,063	66,351	62,418	1.5	987	1.08	32,335	3.9
2017	1,082	68,800	63,586	1.9	1,000	1.08	33,527	3.7
2018	1,067	69,911	65,522	3.0	1,015	1.05	34,864	4.0

Note: Years prior to 12/31/2012 were provided by prior actuary.

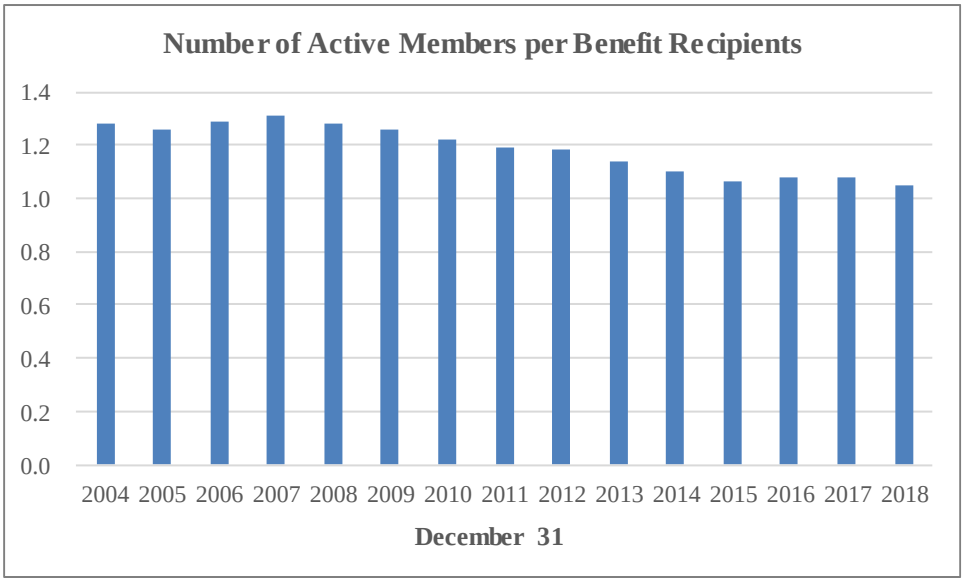


TABLE 15

Comparison of Valuation Results under Alternate Investment Return Assumptions

This exhibit compares the key December 31, 2018 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions are unchanged for purposes of this analysis.

Investment Return Assumption	**7.00%**	**7.25%**	**7.50%**	**7.75%**	**8.00%**
Contributions					
Total Normal Cost	24.5%	23.1%	21.7%	20.5%	19.3%
Member Contributions	(7.0%)	(7.0%)	(7.0%)	(7.0%)	(7.0%)
Employer Normal Cost	17.5%	16.1%	14.7%	13.5%	12.3%
Unfunded Actuarial Liability	11.3%	9.2%	7.2%	5.1%	3.1%
Total Employer Contribution	28.8%	25.3%	21.9%	18.6%	15.4%
Actuarial Value of Assets ($ in thousands)	$690,969	$690,969	$690,969	$690,969	$690,969
Actuarial Liability	$807,719	$784,359	$762,085	$740,833	$720,543
Funded Ratio	85.5%	88.1%	90.7%	93.3%	95.9%

The actuarial liability is a measure intended to help the reader assess (i) a retirement system's funded status on an on-going concern basis, and (ii) progress being made toward accumulating the assets needed to pay benefits as due. Allocation of the actuarial present value of projected benefits between past and future service was based on service using the Entry Age Normal actuarial cost method. Assumptions, including projected pay increases, were the same as used to determine the System's level percent of payroll annual required contribution between entry age and assumed exit age. Entry age was established by subtracting credited service from current age on the valuation date.

The Entry Age Normal actuarial liability was determined as part of an actuarial valuation of the System as of December 31, 2018. Significant actuarial assumptions used in determining the actuarial liability include:

(a) A net rate of return on the investment of present and future assets of 7.50% per year compounded annually,

(b) Projected salary increases of 3.25% per year compounded annually, (2.75% attributable to inflation, and 0.50% attributable to productivity),

(c) Additional projected salary increases of 0.75% to 2.50% per year attributable to seniority/merit, and

(d) In addition, the benefit structure includes a cost of living adjustment so benefits increase 2.00% per year, non-compounded, commencing 36 months after retirement.

Actuarial Liability:	
Active members	$336,992,074
Retired members and beneficiaries currently receiving benefits	412,681,186
Nonvested terminated members due a refund	114,948
Vested terminated members not yet receiving benefits	12,297,118
Total Actuarial Liability	$762,085,326
Actuarial Value of Assets (market value was $634,054,617)	$690,969,459
Unfunded Actuarial Liability	$ 71,115,867

During the year ended December 31, 2018, the System experienced a net increase of $52.1 million in the actuarial liability of which $9.8 million was due to changes in the actuarial assumptions and $10.6 million was due to revisions in the programming of the BackDROP provisions.

TABLE 16

Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (AL) (b)	Unfunded AL (UAL) (b)-(a)	Funded Ratio (a)/(b)	Active Member Covered Payroll (c)	UAL as a Percentage of Active Member Covered Payroll [(b)-(a)]/(c)
11/30/1992	$165,132	$198,656	$33,524	83.1 %	$25,000	134.1 %
11/30/1993	180,457	208,966	28,509	86.4	26,008	109.6
11/30/1994	192,668	220,596	27,928	87.3	27,819	100.4
12/31/1995[1]	213,431	231,372	17,941	92.2	29,749	60.3
12/31/1996	237,554	247,408	9,854	96.0	33,366	29.5
12/31/1997	262,815	258,706	(4,109)	101.6	35,502	(11.6)
12/31/1998	295,625	274,900	(20,725)	107.5	36,566	(56.7)
12/31/1999[1]	330,072	291,633	(38,439)	113.2	37,969	(101.2)
12/31/2000	354,044	308,894	(45,150)	114.6	38,613	(116.9)
12/31/2001	362,493	325,335	(37,158)	111.4	42,286	(87.9)
12/31/2002	361,687	340,524	(21,163)	106.2	45,696	(46.3)
12/31/2003	374,171	350,444	(23,727)	106.8	45,876	(51.7)
12/31/2004[1]	392,485	393,387	902	99.8	50,414	1.8
12/31/2005	412,823	414,027	1,204	99.7	52,207	2.3
12/31/2006	444,498	439,179	(5,319)	101.2	53,530	(9.9)
12/31/2007	480,820	468,115	(12,705)	102.7	57,310	(22.2)
12/31/2008	472,345	496,561	24,216	95.1	60,282	40.2
12/31/2009[1]	480,556	519,934	39,378	92.4	63,055 [2]	62.5 [2]
12/31/2010	497,926	536,908	38,982	92.7	63,077	61.8
12/31/2011	510,946	562,488	51,542	90.8	62,759	82.1
12/31/2012	533,381	589,074	55,693	90.5	64,150	86.8
12/31/2013	571,262	617,748	46,486	92.5	65,306	71.2
12/31/2014[1]	600,860	631,904	31,044	95.1	64,572	48.1
12/31/2015	620,149	655,136	34,987	94.7	65,560	53.4
12/31/2016	640,509	681,644	41,136	94.0	66,946	61.4
12/31/2017	677,616	710,017	32,401	95.4	69,634	46.5
12/31/2018[1]	690,969	762,085	71,116	90.7	72,017	98.7

Dollar amounts are in thousands. Numbers may not add due to rounding.
Note: Years prior to 12/31/2012 were provided by prior actuary.

[1] *After changes in benefits and/or actuarial assumptions and/or actuarial cost methods.*
[2] *These amounts have been revised from the $63,479,000 and 62.0% amounts reported in the December 31, 2009 actuarial valuation report.*

Analysis of the dollar amounts of actuarial value of assets, actuarial liability, or unfunded actuarial liability in isolation can be misleading. Expressing the actuarial value of assets as a percentage of the actuarial liability provides one indication of the System's funded status on an on-going concern basis. Analysis of this percentage over time indicates whether the System is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the System's funding. The unfunded actuarial liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial liability as a percentage of covered payroll approximately adjusts for the effects of inflation and aids analysis of the progress being made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the System's funding.

TABLE 17

Schedule of Employer Contributions

Fiscal Year	Actuarial Valuation Date	Annual Required Contribution	Percent Contributed
1997	12/31/1995	$6,343,027	100 %
1998	12/31/1996	6,427,744	100
1999	12/31/1997	6,043,455	100
2000	12/31/1998	5,540,575	100
2001	12/31/1999	4,796,863	100
2002	12/31/2000	4,746,504	100
2003	12/31/2001	5,043,505	100
2004	12/31/2002	6,925,467	100
2005	12/31/2003	7,308,916	100
2006	12/31/2004	9,849,536	100
2007	12/31/2005	10,029,253	100
2008	12/31/2006	10,549,401	100
2009	12/31/2007	11,034,552	100
2010	12/31/2008	13,119,984	100
2011	12/31/2009	13,806,880	100
2012	12/31/2010	14,113,014	100
2013	12/31/2011	14,889,714	100
2014	12/31/2012	14,464,181	100
2015	12/31/2013	13,964,379	100
2016	12/31/2014	12,585,895	100
2017	12/31/2015	13,369,785	100
2018	12/31/2016	14,331,422	100

Note: Years prior to 2012 were provided by prior actuary.

Summary of Actuarial Methods and Assumptions

Valuation Date	December 31, 2018
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level percent of payroll, open
Remaining Amortization Period	20 years
Asset Valuation Method	Expected Value + 25% of (Market – Expected Values)
Actuarial Assumptions:	
Investment Net Rate of Return*	7.50%
Projected Salary Increases*	4.00% to 5.75%
*Includes Inflation at	2.75%
Cost-of-Living Adjustment Provisions	2.00% non-compounding commencing 36 months after retirement

TABLE 18

Solvency Test

Valuation Date	Aggregate Actuarial Liability For (1) Active Member Contributions	(2) Retirants and Beneficiaries*	(3) Active Members (Employer Financed Portion)	Reported Valuation Assets	Portion of Actuarial Liabilities Covered by Reported Assets (1)	(2)	(3)
12/31/1995	$19,597,012	$132,215,980	$79,559,050	$213,431,416	100.0 %	100.0 %	77.4 %
12/31/1996	20,807,624	141,902,560	84,497,686	237,553,602	100.0	100.0	88.6
12/31/1997	22,518,199	146,068,362	90,119,236	262,814,796	100.0	100.0	104.6
12/31/1998	23,845,658	157,021,415	94,033,395	295,624,986	100.0	100.0	122.0
12/31/1999	24,759,118	170,478,501	96,395,412	330,071,866	100.0	100.0	139.9
12/31/2000	27,152,206	183,463,718	98,277,967	354,044,311	100.0	100.0	145.9
12/31/2001	27,694,761	183,034,623	114,605,637	362,493,060	100.0	100.0	132.4
12/31/2002	34,440,696	182,063,498	124,019,921	361,687,109	100.0	100.0	117.1
12/31/2003	37,027,041	186,930,565	126,486,746	374,170,781	100.0	100.0	118.8
12/31/2004	40,959,525	201,051,248	151,375,876	392,484,697	100.0	100.0	99.4
12/31/2005	44,057,922	210,560,068	159,408,592	412,822,760	100.0	100.0	99.2
12/31/2006	48,361,719	216,449,174	174,368,239	444,497,827	100.0	100.0	103.1
12/31/2007	53,686,866	230,893,426	183,634,348	480,820,001	100.0	100.0	106.9
12/31/2008	58,050,319	238,590,747	199,920,080	472,345,191	100.0	100.0	87.9
12/31/2009	60,326,408	257,298,665	202,309,181	480,555,562	100.0	100.0	80.5
12/31/2010	63,515,814	270,693,677	202,698,947	497,925,786	100.0	100.0	80.8
12/31/2011	66,390,179	293,730,691	202,367,017	510,946,217	100.0	100.0	74.5
12/31/2012	70,527,705	305,985,839	212,559,831	533,380,618	100.0	100.0	73.8
12/31/2013	74,238,693	325,096,785	218,412,805	571,261,929	100.0	100.0	78.7
12/31/2014	74,684,418	348,915,979	208,304,004	600,860,146	100.0	100.0	85.1
12/31/2015	77,222,492	364,943,124	212,970,051	620,148,816	100.0	100.0	83.6
12/31/2016	81,765,281	377,864,418	222,014,789	640,508,756	100.0	100.0	81.5
12/31/2017	85,753,036	393,307,456	230,956,665	677,616,328	100.0	100.0	86.0
12/31/2018	88,116,395	425,093,252	248,875,679	690,969,459	100.0	100.0	71.4

**Includes vested and non-vested terminated members*
Note: Years prior to 12/31/2012 were provided by prior Actuary.

During the twelve months ended December 31, 2018, the Police and Fire Retirement System of Wichita, Kansas generated an actuarial loss of $20.2 million. This amount is 2.8% of the actuarial liability at the beginning of the year.

MEMBER DATA RECONCILIATION

December 31, 2017 to December 31, 2018

The number of members included in the valuation, as summarized in the table below, is in accordance with the data submitted by the System for members of the valuation date.

	Active Participants		Retirees, Beneficiaries and Disableds		Inactive Vested		Inactive Non-Vested	Total
	Police	Fire	Police	Fire	Police	Fire	Police	
Members as of 12/31/2017	**630**	**452**	**501**	**499**	**26**	**7**	**0**	**2,115**
New Members	+18	+26	+4	+4	0	0	0	+52
Transfers	-1	+1	0	0	0	0	0	0
Rehires	+1	0	0	0	-1	0	0	0
Terminations								
Refunded	-7	-1	0	0	-1	0	0	-9
Refund Due	-8	0	0	0	0	0	+8	0
Deferred Vested	-8	-1	0	0	+8	+1	0	0
Completion of payments to minor child	0	0	-1	-1	0	0	0	-2
Retirements								
Service	-17	-13	+18	+13	-1	0	0	0
Disability	-4	0	+4	0	0	0	0	0
Deaths								
Cashed Out	0	0	-1	0	0	0	0	-1
With Beneficiary	-1	0	-1	-4	0	0	0	-6
Without Beneficiary	0	0	-9	-11	0	0	0	-20
Data Adjustments	0	0	0	0	1	-1	0	0
Members as of 12/31/2018	**603**	**464**	**515**	**500**	**32**	**7**	**8**	**2,129**

HISTORICAL ACTIVE DATA
as of December 31, 2018

Valuation Date	Number of Members			Annual Covered Payroll ($000's)*	Average Annual Pay	% Increase In Average Annual Pay
	Plan A	Plan C-79	Total Members			
12/31/2005	62	988	1,050	$52,207	$49,721	4.90 %
12/31/2006	59	1,021	1,080	53,530	49,565	(0.31)
12/31/2007	57	1,035	1,092	57,310	52,482	5.89
12/31/2008	47	1,029	1,076	60,282	56,024	6.75
12/31/2009	32	1,068	1,100	63,055	57,323	2.32
12/31/2010	21	1,068	1,089	63,077	57,922	1.04
12/31/2011	14	1,074	1,088	62,759	57,683	(0.41)
12/31/2012	11	1,073	1,084	64,150	59,179	2.59
12/31/2013	9	1,076	1,085	65,306	60,190	1.71
12/31/2014	8	1,060	1,068	64,572	60,461	0.45
12/31/2015	5	1,045	1,050	65,560	62,439	3.27
12/31/2016	4	1,059	1,063	66,946	62,979	0.86
12/31/2017	2	1,080	1,082	69,634	64,357	2.19
12/31/2018	2	1,065	1,067	72,017	67,495	4.88

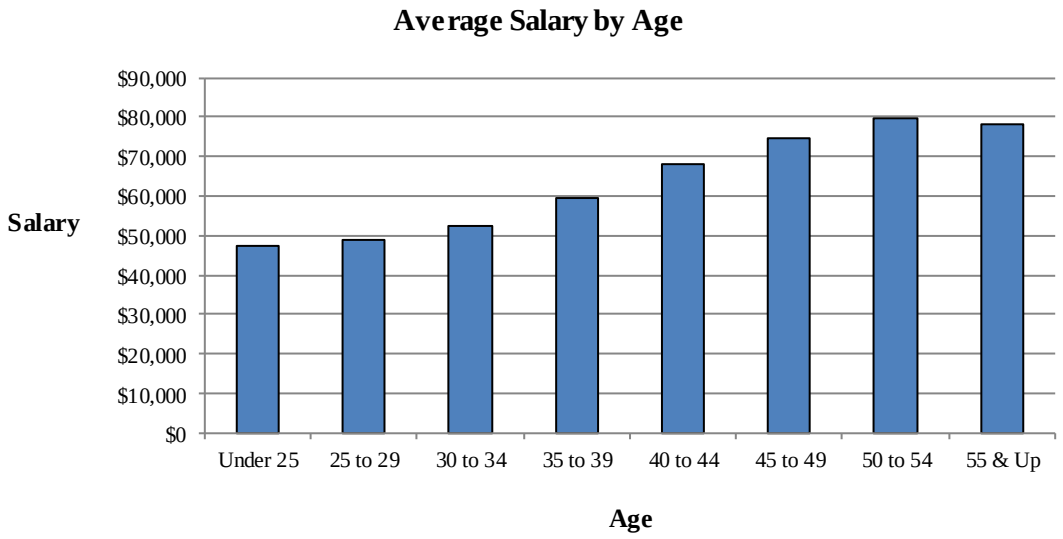
* Actual covered payroll is imputed from actual employee contributions for the year.

SUMMARY OF ACTIVE MEMBERS
as of December 31, 2018

Total

Age	Number			Valuation Salaries*		
	Police	Fire	Total	Police	Fire	Total
Under 25	12	10	22	$ 608,357	$ 437,728	$ 1,046,085
25 to 29	76	38	114	3,841,046	1,758,131	5,599,177
30 to 34	90	74	164	4,879,855	3,752,824	8,632,679
35 to 39	79	102	181	5,045,756	5,696,699	10,742,455
40 to 44	87	65	152	6,287,085	4,069,788	10,356,873
45 to 49	126	73	199	9,893,102	5,000,962	14,894,064
50 to 54	85	60	145	7,170,322	4,416,940	11,587,262
55 & Up	48	42	90	3,906,840	3,146,032	7,052,872
Total	603	464	1,067	$41,632,363	$28,279,104	$69,911,467

** Actual salary as reported by System for year ending 12/31/2018*

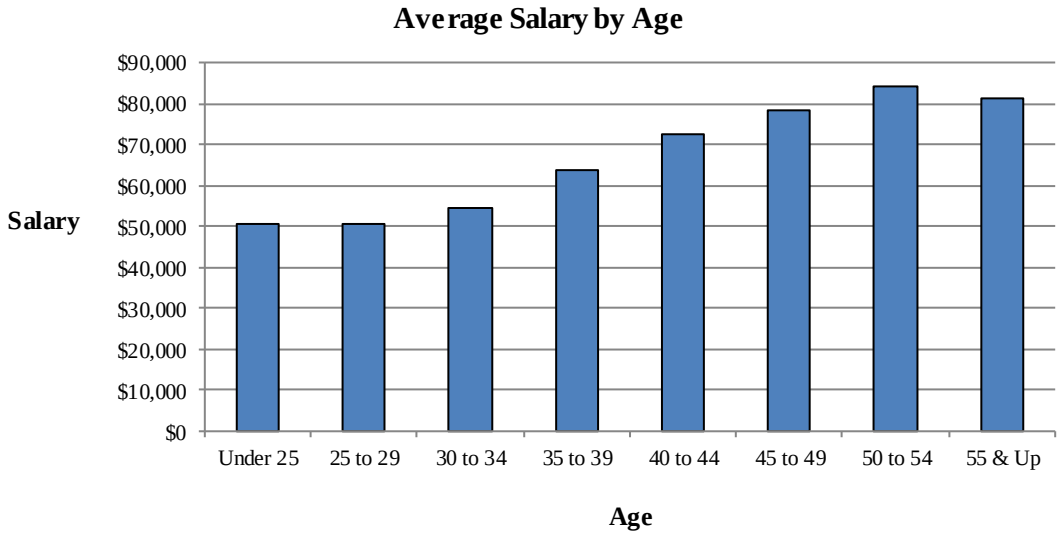


SUMMARY OF ACTIVE MEMBERS
as of December 31, 2018

Police

Age	Number			Valuation Salaries*		
	Male	Female	Total	Male	Female	Total
Under 25	7	5	12	$ 354,102	$ 254,255	$ 608,357
25 to 29	66	10	76	3,322,500	518,546	3,841,046
30 to 34	81	9	90	4,384,940	494,915	4,879,855
35 to 39	70	9	79	4,484,964	560,792	5,045,756
40 to 44	72	15	87	5,206,159	1,080,926	6,287,085
45 to 49	110	16	126	8,668,005	1,225,097	9,893,102
50 to 54	81	4	85	6,830,528	339,794	7,170,322
55 & Up	45	3	48	3,685,190	221,650	3,906,840
Total	532	71	603	$36,936,388	$4,695,975	$41,632,363

** Actual salary as reported by System for year ending 12/31/2018*

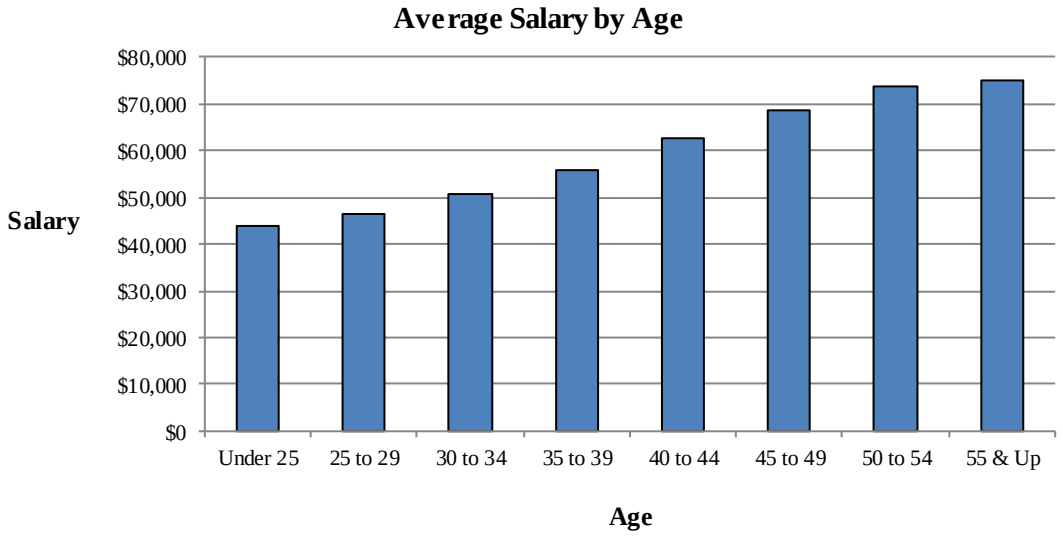


SUMMARY OF ACTIVE MEMBERS
as of December 31, 2018

Fire

Age	Number			Valuation Salaries*		
	Male	Female	Total	Male	Female	Total
Under 25	9	1	10	$ 393,435	$ 44,293	$ 437,728
25 to 29	37	1	38	1,712,341	45,790	1,758,131
30 to 34	72	2	74	3,659,386	93,438	3,752,824
35 to 39	100	2	102	5,588,184	108,515	5,696,699
40 to 44	64	1	65	4,010,260	59,528	4,069,788
45 to 49	73	0	73	5,000,962	0	5,000,962
50 to 54	59	1	60	4,354,484	62,456	4,416,940
55 & Up	41	1	42	2,994,937	151,095	3,146,032
Total	455	9	464	$27,713,989	$565,115	$28,279,104

** Actual salary as reported by System for year ending 12/31/2018*

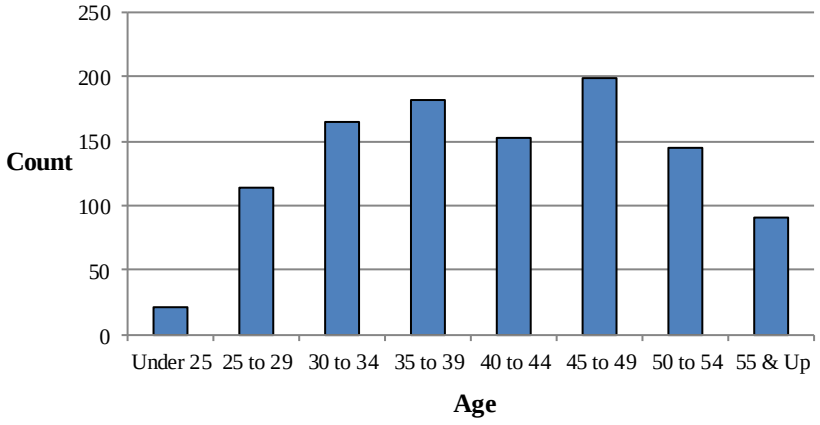


DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2018

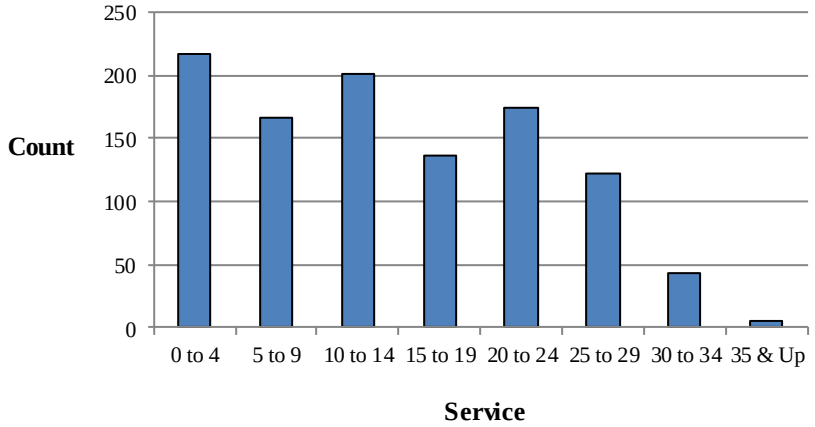
Total

	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 & Up	Total
Under 25	22	0	0	0	0	0	0	0	22
25 to 29	95	19	0	0	0	0	0	0	114
30 to 34	67	69	28	0	0	0	0	0	164
35 to 39	24	52	87	18	0	0	0	0	181
40 to 44	5	17	52	56	22	0	0	0	152
45 to 49	3	8	26	54	89	19	0	0	199
50 to 54	1	0	2	6	51	73	12	0	145
55 & Up	0	2	6	3	13	30	31	5	90
Total	217	167	201	137	175	122	43	5	1,067

Age Distribution



Service Distribution

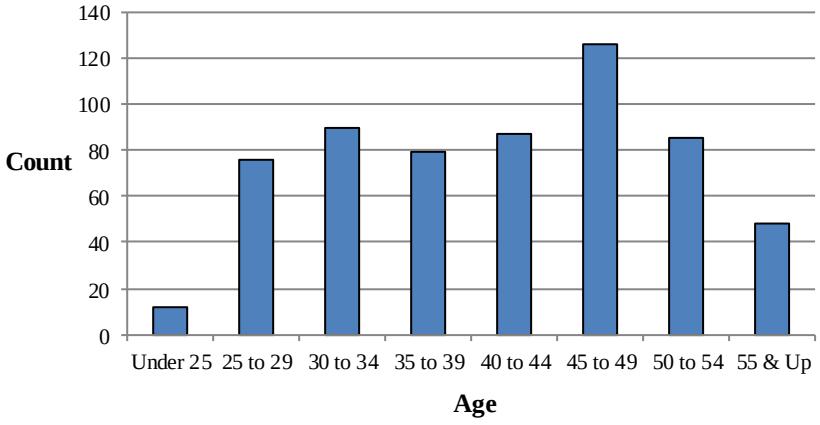


DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2018

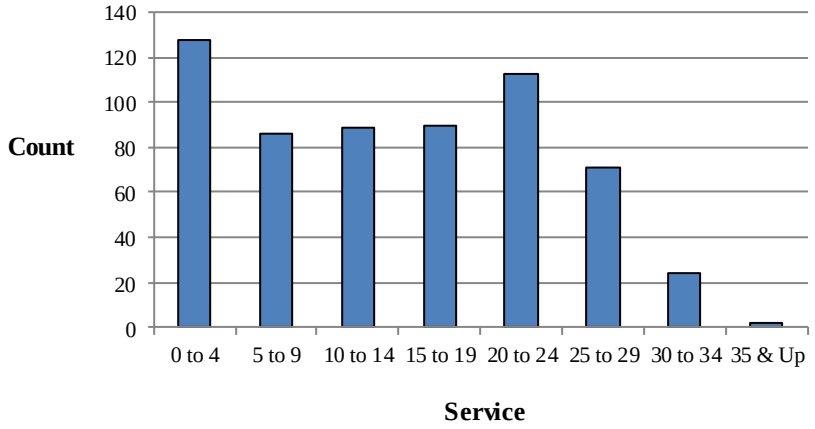
Police

	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 & Up	Total
Under 25	12	0	0	0	0	0	0	0	12
25 to 29	63	13	0	0	0	0	0	0	76
30 to 34	39	38	13	0	0	0	0	0	90
35 to 39	7	21	40	11	0	0	0	0	79
40 to 44	3	8	20	41	15	0	0	0	87
45 to 49	3	4	11	34	59	15	0	0	126
50 to 54	1	0	1	2	31	43	7	0	85
55 & Up	0	2	4	2	8	13	17	2	48
Total	128	86	89	90	113	71	24	2	603

Age Distribution



Service Distribution

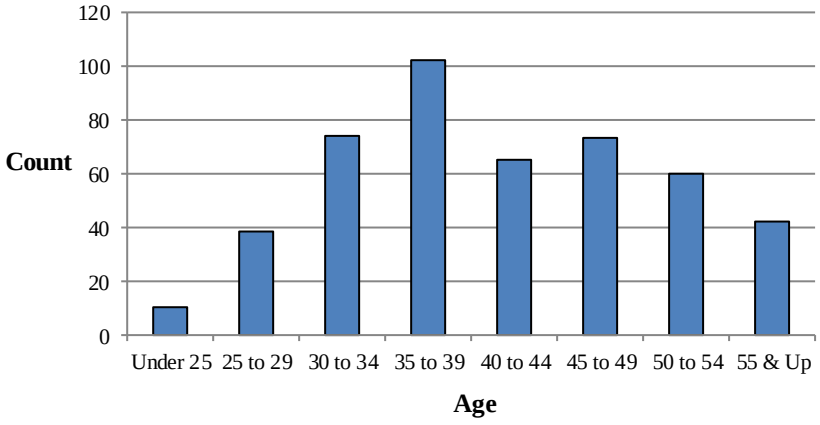


DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2018

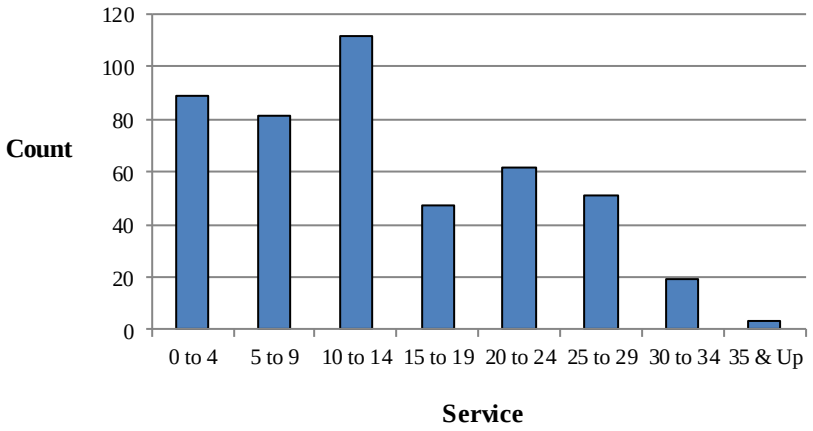
Fire

	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 & Up	Total
Under 25	10	0	0	0	0	0	0	0	10
25 to 29	32	6	0	0	0	0	0	0	38
30 to 34	28	31	15	0	0	0	0	0	74
35 to 39	17	31	47	7	0	0	0	0	102
40 to 44	2	9	32	15	7	0	0	0	65
45 to 49	0	4	15	20	30	4	0	0	73
50 to 54	0	0	1	4	20	30	5	0	60
55 & Up	0	0	2	1	5	17	14	3	42
Total	89	81	112	47	62	51	19	3	464

Age Distribution



Service Distribution



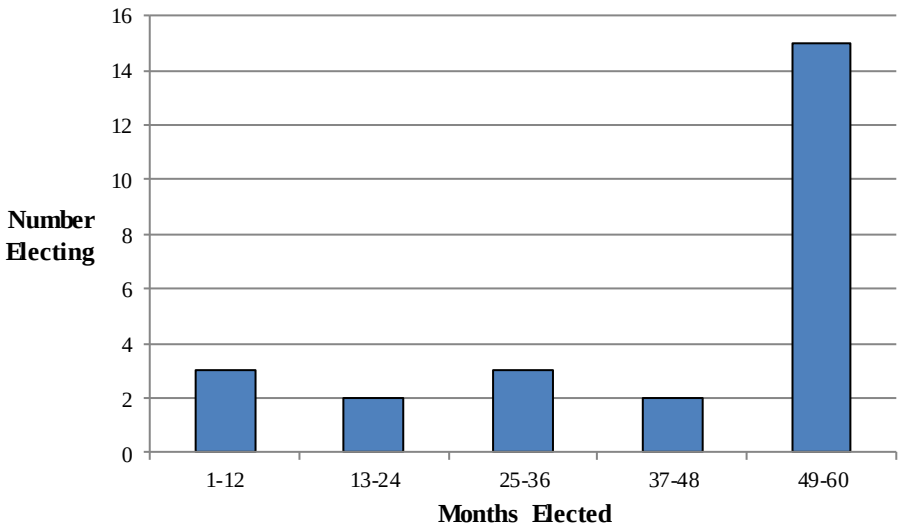
BackDROP Experience for the 2018 Plan Year

Total

Number Electing BackDROP

Distribution of BackDROP Election Period

	Final Benefit as a Proportion of Final Average Pay					
Age	Under 55%	55%-60%	60%-65%	65%-70%	70%-75%	Total
Under 55	3	2	1	1	1	8
55-59	2	1	2	2	4	11
60-64	0	0	0	0	5	5
65 & Up	0	0	0	1	0	1
Total	5	3	3	4	10	25



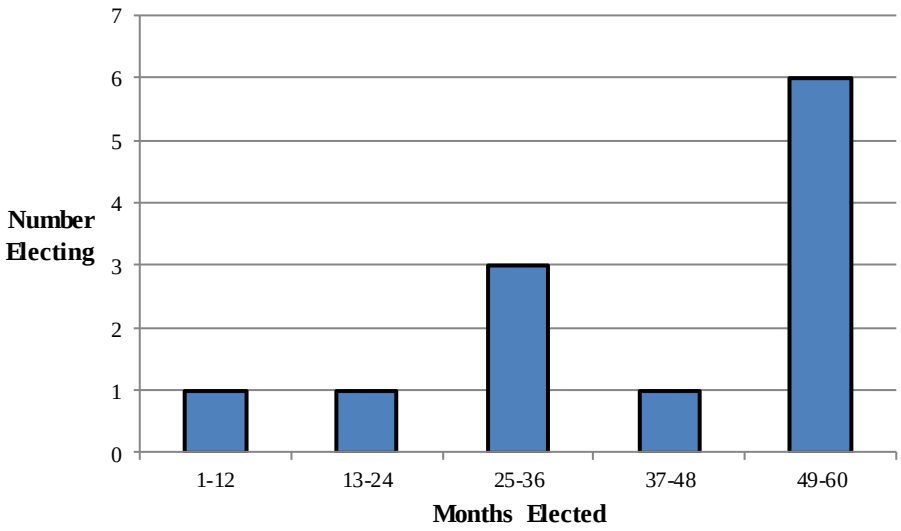
BackDROP Experience for the 2018 Plan Year

Police

Number Electing BackDROP

Distribution of BackDROP Election Period

	Final Benefit as a Proportion of Final Average Pay					
Age	Under 55%	55%-60%	60%-65%	65%-70%	70%-75%	Total
Under 55	2	2	0	1	0	5
55-59	0	1	0	2	2	5
60-64	0	0	0	0	1	1
65 & Up	0	0	0	1	0	1
Total	2	3	0	4	3	12



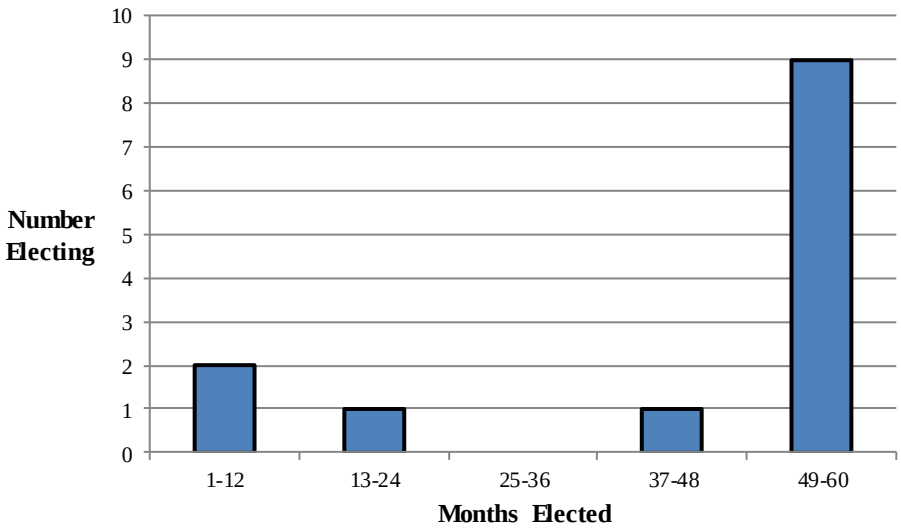
BackDROP Experience for the 2018 Plan Year

Fire

Number Electing BackDROP

Distribution of BackDROP Election Period

	Final Benefit as a Proportion of Final Average Pay					
Age	Under 55%	55%-60%	60%-65%	65%-70%	70%-75%	Total
Under 55	1	0	1	0	1	3
55-59	2	0	2	0	2	6
60-64	0	0	0	0	4	4
65 & Up	0	0	0	0	0	0
Total	3	0	3	0	7	13



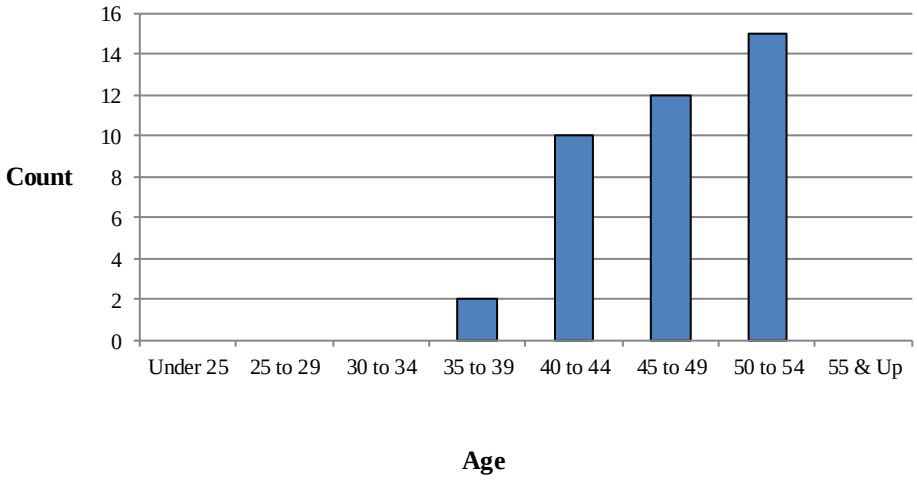
SUMMARY OF INACTIVE VESTED MEMBERS

as of December 31, 2018

Total – By Group

Age	Number			Current Annual Benefit at Retirement		
	Police	Fire	Total	Police	Fire	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0
35 to 39	2	0	2	80,532	0	80,532
40 to 44	7	3	10	255,208	91,063	346,271
45 to 49	10	2	12	409,995	60,455	470,450
50 to 54	13	2	15	414,497	39,314	453,811
55 & Up	0	0	0	0	0	0
Total	32	7	39	$1,160,232	$190,832	$1,351,064

Age Distribution



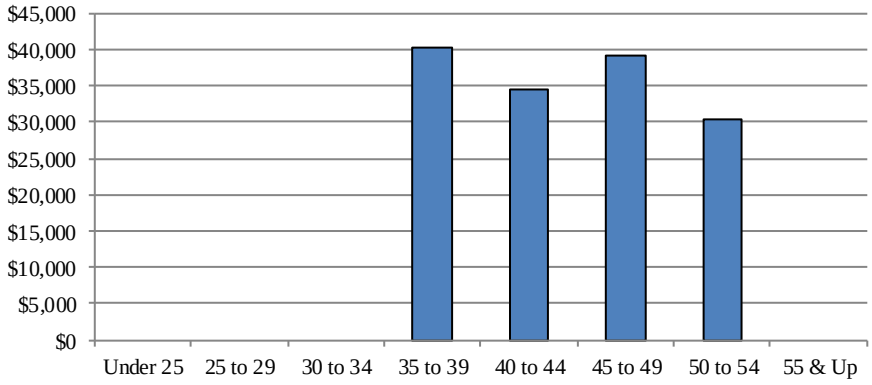
SUMMARY OF INACTIVE VESTED MEMBERS

as of December 31, 2018

Total – By Gender

Age	Number			Current Annual Benefit at Retirement		
	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0
35 to 39	2	0	2	80,532	0	80,532
40 to 44	7	3	10	208,815	137,456	346,271
45 to 49	9	3	12	377,915	92,535	470,450
50 to 54	15	0	15	453,811	0	453,811
55 & Up	0	0	0	0	0	0
Total	33	6	39	$1,121,073	$229,991	$1,351,064

Average Benefit



Age

AVERAGE MONTHLY BENEFITS FOR NEW RETIREES

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Average monthly pension										
0 - 5 Years of Service	$ -	$ -	$ -	$ -	$ 3,710	$ -	$ -	$ -	$ 290	$ -
5 - 10 Years of Service	-	-	-	-	-	3,371	-	-	-	3,016
10 - 15 Years of Service	-	2,744	2,688	-	1,867	2,254	2,344	2,381	2,852	2,237
15 - 20 Years of Service	4,549	2,533	1,895	4,203	1,993	3,930	3,929	3,784	-	3,834
20 - 25 Years of Service	3,861	3,144	3,108	3,004	2,971	3,037	3,691	2,983	2,745	2,808
25 - 30 Years of Service	4,073	4,320	4,509	4,074	4,212	4,138	-	4,064	3,646	3,964
30+ Years of Service	4,359	6,304	4,658	4,589	4,870	4,790	-	4,847	1,993	4,034
Average for All Years of Service	**$ 4,116**	**$ 3,972**	**$ 4,235**	**$ 3,979**	**$ 3,984**	**$ 3,697**	**$ 3,281**	**$ 3,349**	**$ 2,928**	**$ 3,180**
Average final average salary										
0 - 5 Years of Service	$ -	$ -	$ -	$ -	$ 4,890	$ -	$ -	$ -	$ 2,956	$ -
5 - 10 Years of Service	-	-	-	-	-	4,262	-	-	-	3,341
10 - 15 Years of Service	-	5,122	5,014	-	5,150	4,065	3,838	3,980	5,058	5,074
15 - 20 Years of Service	5,429	4,726	3,590	5,280	4,842	4,961	5,120	4,970	-	4,893
20 - 25 Years of Service	6,062	5,596	5,586	5,490	5,132	4,936	5,652	4,704	5,100	4,771
25 - 30 Years of Service	6,196	6,349	6,887	5,963	5,698	5,696	-	5,810	5,134	5,426
30+ Years of Service	5,711	7,929	5,917	5,824	6,192	6,387	-	6,463	4,269	5,378
Average for All Years of Service	**$ 5,983**	**$ 6,082**	**$ 6,055**	**$ 5,756**	**$ 5,671**	**$ 5,337**	**$ 4,959**	**$ 4,997**	**$ 4,839**	**$ 4,943**
Number of members retiring										
0 - 5 Years of Service	-	-	-	-	1	-	-	-	1	-
5 - 10 Years of Service	-	-	-	-	-	1	-	-	-	2
10 - 15 Years of Service	-	1	1	-	1	3	2	2	2	4
15 - 20 Years of Service	1	5	1	1	1	1	1	2	-	1
20 - 25 Years of Service	10	7	2	8	13	10	3	9	2	12
25 - 30 Years of Service	13	14	7	9	11	20	-	4	7	9
30+ Years of Service	11	4	10	11	17	2	-	1	2	1
Total for All Years of Service	**35**	**31**	**21**	**29**	**44**	**37**	**6**	**18**	**14**	**29**

DISTRIBUTION OF IN-PAY MEMBERS

as of December 31, 2018

Amount of Monthly Benefit	Non-Service Disability	QDRO[1]	Recalc. Service Disability	Service	Service Disability	Survivor	Total
$ 0-500	0	3	0	5	0	2	10
500-1,000	2	8	0	7	2	23	42
1,000-1,500	4	7	1	49	0	31	92
1,500-2,000	0	1	1	93	0	41	136
2,000-2,500	0	1	2	126	0	42	171
2,500-3,000	0	0	4	105	5	16	130
3,000-3,500	0	0	6	85	6	2	99
3,500-4,000	0	0	15	78	10	2	105
4,000-4,500	0	0	22	71	11	1	105
4,500-5,000	0	0	4	56	1	1	62
>5,000	0	0	5	55	2	1	63
Total	**6**	**20**	**60**	**730**	**37**	**162**	**1,015**

[1] *Qualified Domestic Relations Order*

RETIRANTS AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS

Valuation Date	Added to Rolls		Removed from Rolls		End of Year Rolls		Annual Pensions	
	No.	Annual Pensions[1]	No.	Annual Pensions[1]	No.	Annual Pensions[1]	Average Pension	Percentage Increase (Decrease)
12/31/2005	24	$704,201	21	$213,529	835	$17,829,449	$21,302	4.0 %
12/31/2006	29	715,353	26	389,856	840	18,349,917	21,845	2.5
12/31/2007	21	548,513	28	452,202	833	18,777,464	22,542	3.2
12/31/2008	39	510,543	32	417,236	840	19,492,053	23,205	2.9
12/31/2009	57	1,959,741	24	398,908	873	21,357,569	24,465	5.4
12/31/2010	47	1,439,435	28	541,662	892	22,570,141	25,303	3.4
12/31/2011	48	1,615,338	29	525,289	911	24,030,607	26,378	4.2
12/31/2012	33	1,201,800	23	435,120	921	25,226,219	27,390	3.8
12/31/2013	48	1,938,485	17	380,985	952	27,143,376	28,512	4.1
12/31/2014	63	2,400,693	42	850,741	971	29,165,652	30,037	5.3
12/31/2015	44	1,652,860	26	494,625	989	30,774,324	31,117	3.6
12/31/2016	31	1,286,489	33	629,314	987	31,914,576	32,335	3.9
12/31/2017	41	1,757,606	28	694,600	1,000	33,526,716	33,527	3.7
12/31/2018	43	1,888,265	28	544,427	1,015	35,386,980	34,864	4.0

[1] *Values are estimated based on annualized pension amounts.*

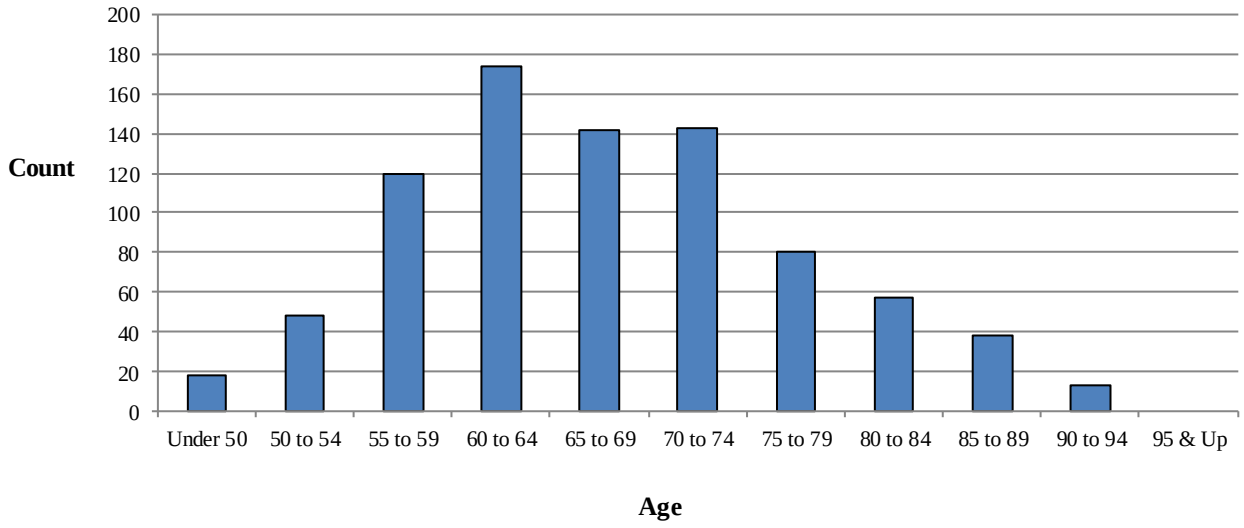
SUMMARY OF RETIRED MEMBERS

as of December 31, 2018

Total – By Group

	Number			Current Monthly Benefit at Retirement		
Age	Police	Fire	Total	Police	Fire	Total
Under 50	16	2	18	$ 64,099	$ 7,220	$ 71,319
50 to 54	35	13	48	150,198	47,690	197,888
55 to 59	68	52	120	270,485	192,993	463,478
60 to 64	84	90	174	329,884	318,595	648,479
65 to 69	68	74	142	220,661	230,520	451,181
70 to 74	73	70	143	198,460	211,708	410,168
75 to 79	38	42	80	89,842	91,672	181,514
80 to 84	23	34	57	44,919	68,720	113,639
85 to 89	16	22	38	25,989	44,133	70,122
90 to 94	3	10	13	4,990	18,686	23,676
95 & Up	0	0	0	0	0	0
Total	424	409	833	$1,399,527	$1,231,937	$2,631,464

Age Distribution

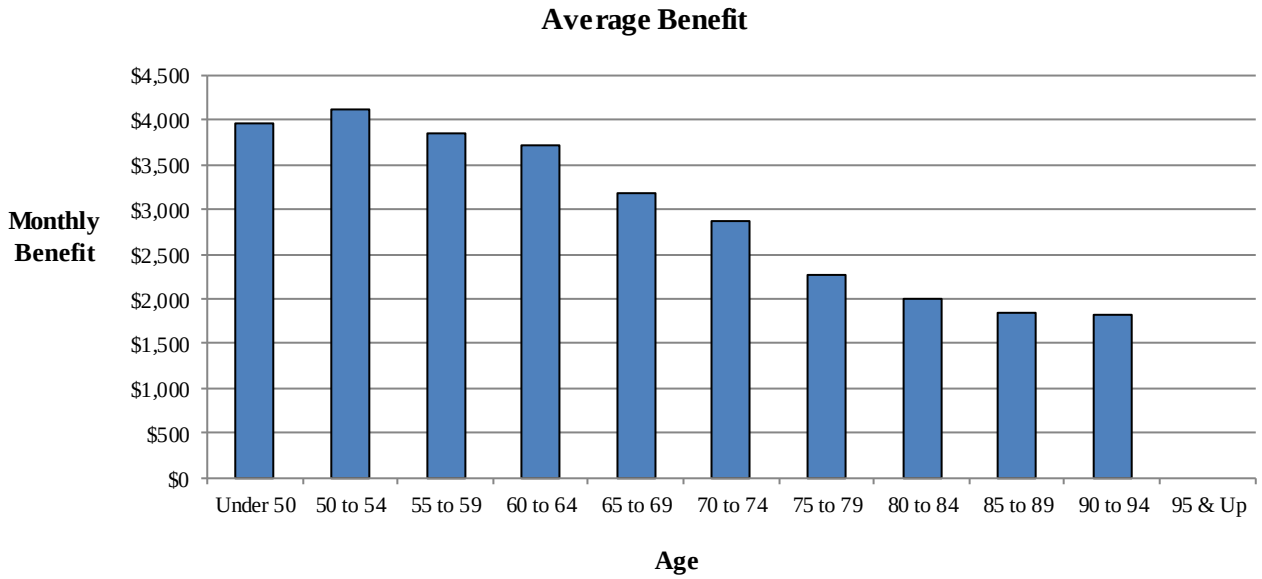


SUMMARY OF RETIRED MEMBERS

as of December 31, 2018

Total – By Gender

Age	Number			Current Monthly Benefit at Retirement		
	Male	Female	Total	Male	Female	Total
Under 50	10	8	18	$ 41,052	$ 30,267	$ 71,319
50 to 54	42	6	48	175,270	22,618	197,888
55 to 59	117	3	120	452,336	11,142	463,478
60 to 64	166	8	174	614,810	33,669	648,479
65 to 69	141	1	142	447,699	3,482	451,181
70 to 74	140	3	143	403,708	6,460	410,168
75 to 79	77	3	80	175,702	5,812	181,514
80 to 84	55	2	57	110,371	3,268	113,639
85 to 89	37	1	38	67,908	2,214	70,122
90 to 94	13	0	13	23,676	0	23,676
95 & Up	0	0	0	0	0	0
Total	798	35	833	$2,512,532	$118,932	$2,631,464



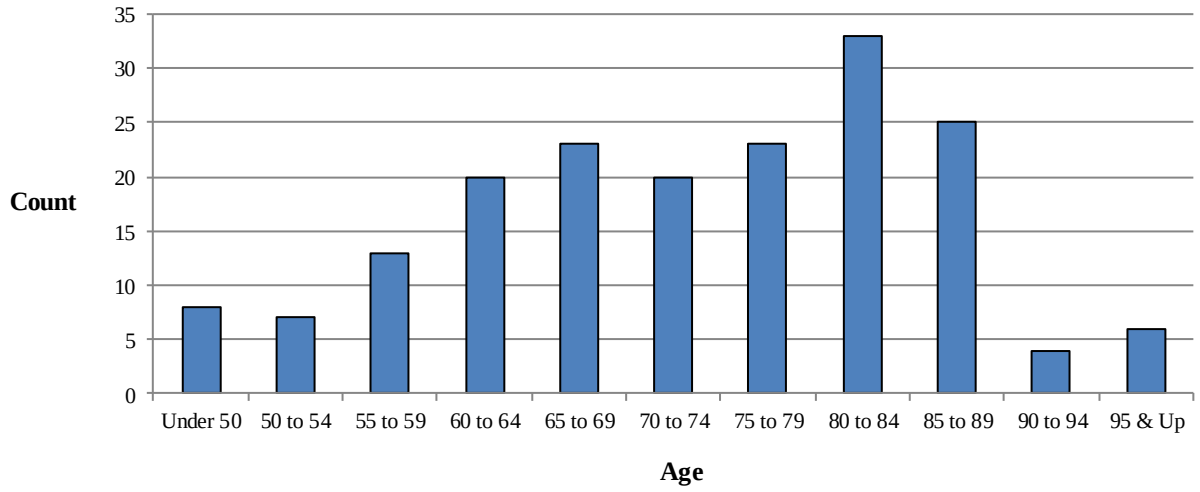
SUMMARY OF BENEFICIARIES

as of December 31, 2018

Total – By Group

	Number			Current Monthly Benefit at Retirement		
Age	Police	Fire	Total	Police	Fire	Total
Under 50	5	3	8	$ 5,545	$ 1,953	$ 7,498
50 to 54	3	4	7	4,922	10,018	14,940
55 to 59	8	5	13	8,282	7,802	16,084
60 to 64	10	10	20	23,115	25,925	49,040
65 to 69	8	15	23	17,108	26,513	43,621
70 to 74	13	7	20	23,292	12,583	35,875
75 to 79	10	13	23	17,800	31,660	49,460
80 to 84	17	16	33	27,470	21,859	49,329
85 to 89	12	13	25	16,999	23,309	40,308
90 to 94	2	2	4	2,696	1,814	4,510
95 & Up	3	3	6	3,546	3,240	6,786
Total	91	91	182	$150,775	$166,676	$317,451

Age Distribution

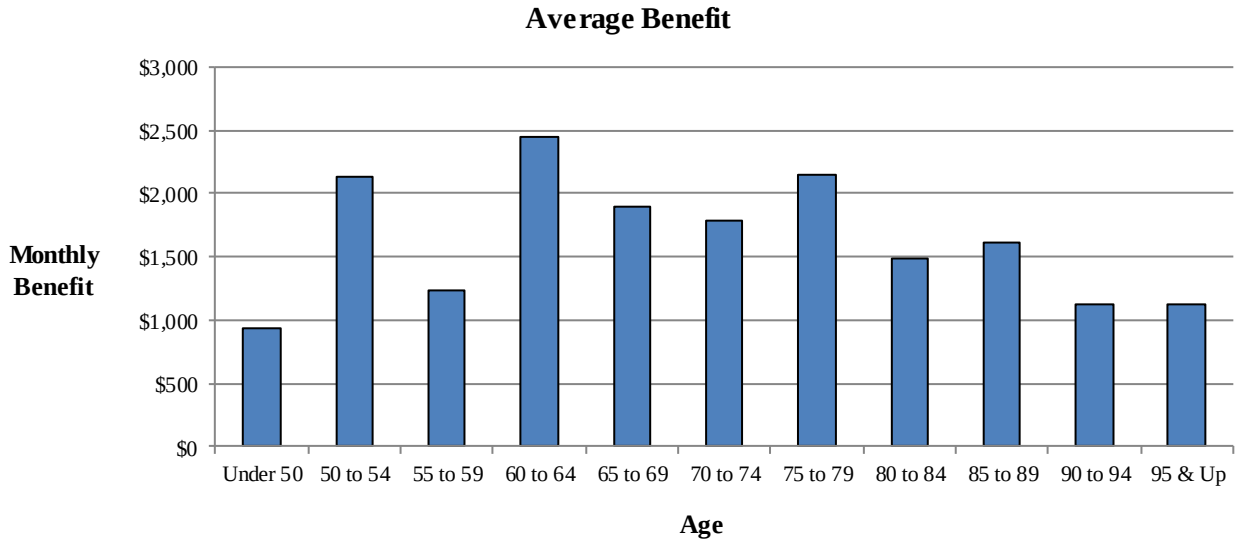


SUMMARY OF BENEFICIARIES

as of December 31, 2018

Total – By Gender

Age	Number			Current Monthly Benefit at Retirement		
	Male	Female	Total	Male	Female	Total
Under 50	3	5	8	$1,501	$ 5,997	$ 7,498
50 to 54	1	6	7	976	13,964	14,940
55 to 59	0	13	13	0	16,084	16,084
60 to 64	0	20	20	0	49,040	49,040
65 to 69	0	23	23	0	43,621	43,621
70 to 74	1	19	20	2,459	33,416	35,875
75 to 79	0	23	23	0	49,460	49,460
80 to 84	0	33	33	0	49,329	49,329
85 to 89	0	25	25	0	40,308	40,308
90 to 94	0	4	4	0	4,510	4,510
95 & Up	0	6	6	0	6,786	6,786
Total	5	177	182	$4,936	$312,515	$317,451



Summary of Benefit Provisions

Plan A is applicable to members who entered the System between January 1, 1965 and December 31, 1978 and members who entered prior to January 1, 1965 and elected Plan A coverage.

Plan B is applicable to members who entered the System prior to January 1, 1965 and elected Plan B coverage.

Plan C is applicable to members entering the System after December 31, 1978.

SERVICE RETIREMENT

Eligibility – Plan A and Plan B: 20 years of service, regardless of age.

Eligibility – Plan C: 30 years of service, regardless of age; or 20 years of service at age 50; or 10 years of service, but less than 20 years at age 55.

Amount of Pension – all plans: Service times 2.5% of Final Average Salary to a maximum of 75% of Final Average Salary.

Final Average Salary – all plans: Average for the 3 consecutive years of service which produce the highest average and which are within the last 10 years of service.

DEFERRED RETIREMENT (VESTED TERMINATION)

Eligibility – all plans: 10 years of service; 20 years of service required to be eligible for survivor benefits.

Amount of Pension – all plans: 2.5% of Final Average Salary times years of service with payments deferred until age 55 (age 50 for Plan C members with 20 or more years of service). Vested deferred pensions for Plan C are adjusted during the deferral period based on changes in National Average Earnings, up to 5.5% annual adjustments (effective for post-1999 terminations).

SERVICE-CONNECTED DISABILITY

Eligibility – all plans: Permanent inability to perform the duties of position; no service requirement.

Amount of Pension – all plans: 75% of final salary rate if accident, 50% if disease.

Miscellaneous Conditions – all plans: Pension plus earnings from gainful employment cannot exceed current salary for rank held at time of disability. Pension recomputed at age 55 using service retirement formula, updated final average salary and service credit for period of disability.

NON-SERVICE DISABILITY

Eligibility – all plans: Permanent inability to perform duties of position; requires 7 years of service and under age 55.

Amount of Pension – all plans: 30% of Final Average Salary plus 1% of Final Average Salary times service over 7 years; maximum is 50% of Final Average Salary.

Miscellaneous Conditions – all plans: Pension plus earnings from gainful employment cannot exceed current salary for rank held at time of disability.

SERVICE-CONNECTED DEATH

Eligibility – all plans: Death resulting directly from service-connected causes; no service requirement.

Amount of Pension – all plans: Surviving spouse – 50% of final Salary plus 10% of final Salary for each child under age 18 to a maximum of 75% of final Salary; terminates upon remarriage prior to age 40 for pensions effective prior to January 1, 2000.

Children (no surviving spouse's pension payable) – 20% of final Salary for each child under age 18 to a maximum of 60% of final Salary.

NON-SERVICE DEATH

Eligibility – Plan A and Plan C: Death after 3 years of service.

Eligibility – Plan B: Death after 20 years of service.

Amount of Pension – Plan A and Plan C: Surviving spouse – 35% of Final Average Salary plus 1% of Final Average Salary for each year of service over 3 to a maximum of 50% of Final Average Salary, plus 10% of Final Average Salary for each child under age 18 to an overall maximum of 66 2/3% of Final Average Salary; terminates upon remarriage prior to age 40 for pensions effective prior to January 1, 2000.

Children (no surviving spouse's pension payable) – 15% of Final Average Salary for each child under age 18 to a maximum of 50% of Final Average Salary.

Amount of Pension – Plan B: Surviving spouse – 50% of final Salary.

Children (no surviving spouse's pension payable) – children under 18 share equally a benefit of 50% of final Salary.

DEATH AFTER RETIREMENT

Eligibility – all plans: Surviving spouse must have been married to retired employee for one year or more at time of death, if retired after January 1, 2000. If retired prior to January 1, 2000, must have been married to retired employee at retirement. Member must have retired with at least 20 years of service.

Amount of Pension – Plan A and Plan C: Surviving spouse – 35% of Final Average Salary plus 1% of Final Average Salary times Service over 3 years to a maximum of 50% of Final Average Salary, plus 10% of Final Average Salary for each child under 18 to an overall maximum of 66 2/3% of Final Average Salary. Post-retirement adjustments are granted from date of retirement to date of death. Terminates upon remarriage prior to age 40 for those retiring prior to January 1, 2000.

Children (no surviving spouse's pension payable) – 15% of Final Average Salary for each child under age 18 to a maximum of 50% of Final Average Salary.

Amount of Pension – Plan B: Surviving spouse – 50% of final Salary.

Children (no surviving spouse's pension payable) – children under 18 share equally a benefit of 50% of final Salary.

NON-VESTED TERMINATION

Eligibility – all plans: Termination of employment and no pension is or will become payable.

Amount of Benefit – all plans: Refund of member's contributions plus 5% annual interest.

FUNERAL BENEFIT

Eligibility – Plan A and Plan C: Death of member who retired after November 21, 1973.

Eligibility – Plan B: Death of retired member.

Amount of Benefit – Plan A and Plan C: $750

Amount of Benefit – Plan B: $100 if member retired on or prior to November 21, 1973; $750 if member retired after November 21, 1973.

POST-RETIREMENT ADJUSTMENTS OF PENSIONS

Eligibility – all plans: Completion of 36 months of retirement.

Annual Amount – all plans: 2% of the original base amount of benefit (simple COLA).

BACKDROP (DEFERRED RETIREMENT OPTION PLAN)

Eligibility: Member must be eligible to retire under service retirement provisions at the effective date of the BackDROP.

Amount: Under the BackDROP, the member may elect a benefit based on a retirement date up to 60 months prior to the current date. The monthly benefit is computed based on service, Final Average Salary and benefit formula at the selected prior date. The DROP account available to the retiring member is the computed benefit multiplied by the number of months of BackDROP plus applicable post-retirement adjustments and 5% annual interest, compounded monthly. Members are eligible to elect a sixty month BackDROP beginning January 1, 2003.

EMPLOYEE CONTRIBUTIONS

Plan A: 8% of Salary
Plan B: 6% of Salary
Plan C: 7% of Salary

These member contribution rates include the 1% decrease effective in 1998 in recognition of the full funding of actuarial liabilities.

CITY CONTRIBUTIONS

Actuarially determined amounts sufficient to satisfy K.S.A. 1977 Suppl. 12-5002.

UNUSED SICK LEAVE

Each bi-weekly service credit of accumulated unused sick leave is converted to a service credit for the purpose of computing annual benefit amounts.

ACTUARIAL COST METHOD

The actuarial cost method is a procedure for allocating the actuarial present value of pension benefits and expenses to time periods. The method used for the valuation is known as the Entry Age Normal actuarial cost method, and has the following characteristics:

(i) The annual normal costs for each individual active member are sufficient to accumulate the value of the member's pension at time of retirement.

(ii) Each annual normal cost is a constant percentage of the member's year-by-year projected covered compensation.

The Entry Age Normal actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's assumed pensionable compensation rates between the entry age of the member and the assumed exit ages.

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future normal costs is called actuarial liability. Deducting actuarial assets from the actuarial liability determines the unfunded actuarial liability or (surplus). The unfunded actuarial liability/(surplus) is financed as a level percent of member payroll over an open 20-year period.

ACTUARIAL ASSUMPTIONS

Retirement System contribution requirements and actuarial present values are calculated by applying experience assumptions to the benefit provisions and membership information of the Retirement System, using the actuarial cost method.

The principal areas of risk which require experience assumptions about future activities of the Retirement System are:

(i) Long-term rates of investment return to be generated by the assets of the System

(ii) Patterns of pay increases to members

(iii) Rates of mortality among members, retirees and beneficiaries

(iv) Rates of termination of employment of active members

(v) Rates of disability among active members

(vi) The age patterns of actual retirements

In making a valuation, the monetary effect of each assumption is calculated for as long as a present current member survives – a period of time which can be as long as a century.

Actual experience of the Retirement System will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experiences. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time, one or more of the assumptions are modified to reflect experience trends (but not random or temporary year-to-year fluctuations). A complete review of the actuarial assumptions was completed in 2018. The use of updated assumptions was first effective with the December 31, 2018 valuation.

Investment Rate of Return (net of expenses): This assumption is 7.50% a year, compounded annually and consists of 2.75% long-term price inflation and a 4.75% real rate of return over price inflation. This assumption, used to equate the value of payments due at different points in time, was adopted by the Board and was first used for the December 31, 2018 valuation.

Salary Increase Rates: These rates are used to project current salary amounts to those upon which a benefit will be based. This table was first used in the December 31, 2018 valuation.

Years of Service	Annual Rate of Salary Increase for Sample Service Durations			
	Inflation Component	Productivity Component	Merit and Longevity	Total
Under 15	2.75%	0.50%	2.50%	5.75%
15 – 17	2.75	0.50	1.00	4.25
18+	2.75	0.50	0.75	4.00

The salary increase assumptions will produce 3.25% annual increases in active member payroll (the inflation and productivity base rate) given a constant active member group size. This is the same payroll growth assumption used to amortize the unfunded actuarial liability.

Changes actually experienced in average pay and total payroll have been as follows:

	Year Ended					5 Year (Average) Compounded Annual Increase
	12/31/18	12/31/17	12/31/16	12/31/15	12/31/14	
Average Pay	3.0%	1.9%	1.5%	2.7%	(0.2%)	1.8%
Total Payroll	1.6%	3.7%	2.8%	0.9%	(1.7%)	1.4%

Mortality Table: This assumption is used to measure the probabilities of members dying and the probabilities of each pension payment being made after retirement.

Healthy Retirees And Beneficiaries: RP-2000 Healthy Annuitant Table for Males and Females projected generationally using Scale AA

Disabled Retirees: RP-2000 Disabled Table for Males and Females projected generationally using Scale AA

Active Members: RP-2000 Employee Table for Males and Females projected generationally using Scale AA

Sample Ages[1]	Present Value of $1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	$138.63	$141.98	32.3	34.6
55	132.05	135.41	27.6	29.7
60	122.80	127.04	23.0	25.1
65	111.13	116.91	18.5	20.7
70	97.31	104.80	14.5	16.7
75	81.63	90.90	10.9	13.0
80	65.36	75.76	7.9	9.8
85	49.97	60.20	5.6	7.1

(1) Reflects values from the basic table based on ages in 2000

This table was first used for the December 31, 2004 actuarial valuation.

Rates of Retirement and BackDROP (Deferred Retirement Option Plan) Elections: This assumption is used to measure the probability of eligible members retiring from active employment and applicable elections under the BackDROP program.

Plan C					
Less than 30 YOS			30 or More YOS		
Age of Member	Police	Fire	Service of Member	Police	Fire
50 – 58	10%	10%	30	0%	0%
59	10	15	31	0	0
60+	100	100	32	25	15
			33	50	20
			34	75	50
			35+	100	100

Plans A & B		
Service of Member	Police	Fire
28 or less	5%	5%
29	5	5
30	10	5
31	10	5
32	30	25
33	50	25
34	50	25
35	100	100
Over 35	100	100

These rates were first used for the December 31, 2018 valuation.

In addition, we assume members who retire under service retirement provisions elect a BackDROP of up to 60 months, if eligible.

Rates of Separation from Active Membership: This assumption measures the probabilities of a member terminating employment. The rates do not apply to members who are eligible to retire.

Years of Service	Percent Separating Within Year	
	Police	Fire
0-5	5.50%	2.00%
6	4.50	2.00
7-8	3.00	2.00
9-13	3.00	1.50
14-16	2.00	1.50
17-22	2.00	0.00
Over 22	0.00	0.00

These rates were first used for the December 31, 2018 valuation.

Forfeiture of Vested Benefits: The assumption is that a percentage of the actuarial present value of vested termination benefits will be forfeited by a withdrawal of accumulated contributions.

Years of Service	Percent Forfeiting
10-14	65%
15-19	10
20 or more	0

This table were first used for the December 31, 2018 actuarial valuation.

Rates of Disability: This assumption measures the probabilities of a member becoming disabled.

Sample Ages	% of Active Members Becoming Disabled During Next Year	
	Police	Fire
20	0.09%	0.07%
25	0.15	0.12
30	0.30	0.24
35	0.49	0.39
40	0.69	0.54
45	0.88	0.70
50	1.08	0.85
55	1.28	0.91

These rates were first used for the December 31, 2014 valuation.

Rates of Recovery from Disability: Assumed to be zero.

Administrative Expenses: Assumed to be paid from investment earnings.

Active Member Group Size: Assumed to remain constant.

Vested Deferred Pensions: Amounts are assumed to increase during the deferral period at 3.50% per year, compounded annually. This assumption was first used for the December 31, 2018 valuation.

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Marriage Assumption: 80% of non-retired participants are assumed to be married for purposes of death benefits. In each case, the male was assumed to be three years older than the female.

Service Related Death and Disability: All active member deaths and 75% of active member disablements are assumed to be service related.

Decrement Timing: Decrements of all types are assumed to occur mid-year.

Eligibility Testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year at the start of the year in which the decrement is assumed to occur.

Benefit Service: Service calculated to the nearest month, as of the decrement date, is used to determine the amount of benefit payable.

Other: The termination of employment decrement does not operate during retirement eligibility.

Miscellaneous Loading Factors: The calculated normal retirement benefits were increased by 2.50% to account for the inclusion of unused sick leave in the calculation of Service. This assumption was first used for the December 31, 2018 valuation.

BackDROP Election: 100% of eligible participants are assumed to elect the BackDROP option upon retirement, and for the maximum DROP period possible.

Actuarial Liability	The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as "accrued liability" or "actuarial liability".
Actuarial Assumptions	Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another singe amount or series of amounts, computed on the basis of appropriate assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefit between future normal cost and actuarial liability; sometimes referred to as the "actuarial funding method".
Experience Gain (Loss)	The difference between actual experience and actuarial assumptions anticipated experience during the period between two actuarial valuation dates.
Actuarial Present Value	The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.
Amortization	Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with lump sum payment.
Normal Cost	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.
Unfunded Actuarial Liability	The difference between actuarial liability and the valuation assets. Most retirement systems have unfunded actuarial liability. They arise each time new benefits are added and each time an actuarial loss is realized. The existence of unfunded actuarial liability is not in itself bad, anymore than a mortgage on a house is bad. Unfunded actuarial liability does not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial liability and the trend in its amount.