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Wichita Employees' Retirement System

Actuarial Valuation as of December 31, 2017





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March 30, 2018

The Board of Trustees
Wichita Employees' Retirement System
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 Wichita Employees' Retirement System as of December 31, 2017. The major findings of the valuation are contained in this report, including the employer contribution rate for fiscal year 2019. The plan provisions and the actuarial assumptions and methods are the same as the prior valuation.

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 requirements 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 you.

Sincerely,

A handwritten signature in blue ink that reads 'Patrice Beckham'.

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

A handwritten signature in blue ink that reads 'Brent A. Banister'.

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



SECTION I: EXECUTIVE SUMMARY

This report presents the results of the December 31, 2017 actuarial valuation of the Wichita Employees' Retirement System. The primary purposes of performing a valuation are to:

- estimate the liabilities for the benefits provided by the System;
- determine the employer contribution rates required to fund the System on an actuarial basis;
- disclose certain asset and liability measures as of the valuation date;
- 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.

There were no changes to the actuarial assumptions and methods or the benefit provisions from the last valuation. The actuarial valuation results, which provide a "snapshot" view of the System's financial condition on December 31, 2017, reflect net favorable experience for the past plan year largely due to an investment return of 17% for 2017. As a result, the unfunded actuarial liability decreased, the funded ratio increased, and the actuarial contribution rate decreased. A summary of the current valuation results, compared to the prior year, is shown below (dollar amounts in millions):

	December 31,		Change
	2017	2016	
Actuarial Liability	\$634.9	\$620.2	\$14.7
Actuarial Assets	<u>598.8</u>	<u>576.0</u>	22.8
Unfunded Actuarial Liability	\$ 36.1	\$ 44.2	(\$8.1)
Funded Ratio			
- Actuarial Value	94.3%	92.9%	1.4%
- Market Value	96.8%	88.6%	8.2%
City Contribution Rate			
- Normal Cost	8.9%	8.9%	0.0%
- Amortization of UAL	<u>3.2%</u>	<u>3.9%</u>	(0.7%)
- Total	12.1%	12.8%	(0.7%)

In the following pages, changes in the assets, liabilities, and contributions of the System over the last year are discussed in more detail.

ASSETS

As of December 31, 2017, the System had total assets of \$614.8 million when measured on a market value basis. This was an increase of \$65.0 million from the December 31, 2016 figure of \$549.8 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%) plus 25% of the difference between the actual market value and expected value. See Table 3 for a detailed development of the actuarial value of assets. The rate of return on the actuarial value of assets was 8.7% which resulted in an



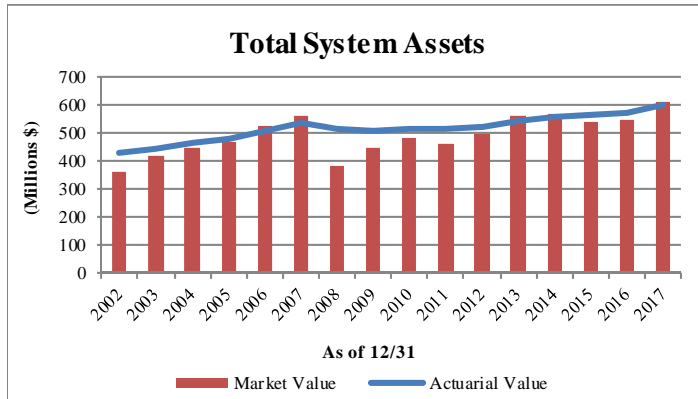
SECTION I: EXECUTIVE SUMMARY

actuarial gain since the actual return exceeded the assume return of 7.75%. Due to deferred investment experience, the market value of assets exceeds the actuarial value by \$16.0 million.

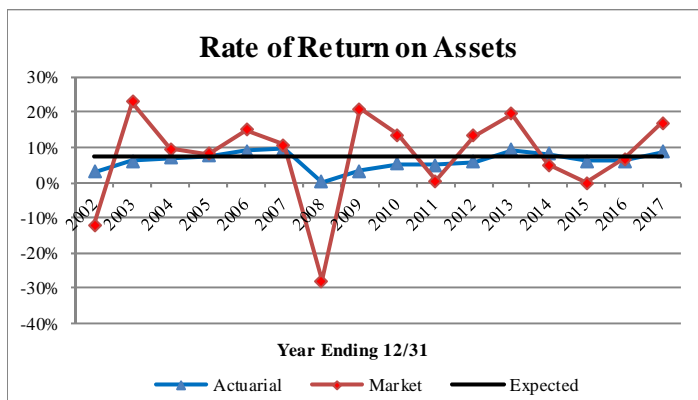
The components of the change in the market and actuarial value of assets for the System (in millions) are set forth below:

	Market Value (\$M)	Actuarial Value (\$M)
Assets, December 31, 2016	\$549.8	\$576.0
- City and Member Contributions	13.3	13.3
- Benefit Payments and Refunds	(39.3)	(39.3)
- Transfers	(0.2)	(0.2)
- Investment Income (net of expenses)	<u>91.2</u>	<u>49.0</u>
Assets, December 31, 2017	\$614.8	\$598.8
Estimated Net Return	17.0%	8.7%

The unrecognized investment gain represents about 3% of the market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the deferred gain of \$16 million is expected to have a positive impact on the future funded ratio and actuarial contribution requirement. If the deferred gain was recognized immediately (actuarial value of assets set equal to market value), the funded percentage would increase from 94% to 97% and the actuarially determined contribution rate for the City would decrease from 12.1% to 10.7% 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.



SECTION I: EXECUTIVE SUMMARY

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, 2017 are:

Actuarial Liability	\$634,907,255
Actuarial Value of Assets	<u>598,793,422</u>
Unfunded Actuarial Liability/(Surplus)	\$ 36,113,833

Between December 31, 2016 and December 31, 2017, the change in the unfunded actuarial liability for the System was as follows (in millions):

Change in Unfunded Actuarial Liability		(\$M)
UAL, December 31, 2016		\$44.2
• Expected change in UAL		0.2
• Investment experience		(5.3)
• Liability experience		(2.8)
• Other experience		<u>(0.2)</u>
UAL, December 31, 2017		\$36.1

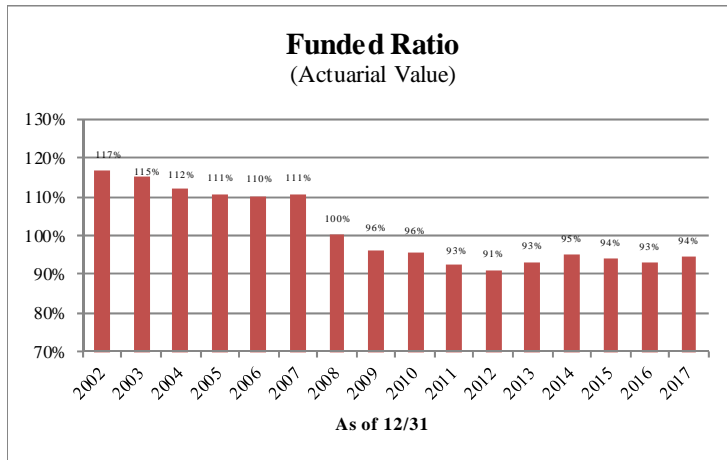
The experience gain for the 2017 plan year of \$8.1 million reflects the combined impact of an actuarial gain of \$5.3 million on System assets (actuarial value) and an actuarial gain of \$2.8 million on System liabilities. The gain on assets was discussed earlier in this report. The gain on System liabilities was primarily due to salary increases that were lower than expected.

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.

	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017
Actuarial Liability (\$M)	\$582.4	\$590.1	\$605.9	\$620.2	\$634.9
Actuarial Value of Assets (\$M)	\$542.2	\$560.0	\$568.5	\$576.0	\$598.8
Funded Ratio (Actuarial Value)	93.1%	94.9%	93.8%	92.9%	94.3%
Funded Ratio (Market Value)	96.9%	96.1%	89.3%	88.6%	96.8%



SECTION I: EXECUTIVE SUMMARY



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 \$16 million difference between the market value and the actuarial value of assets. To the extent there is not unfavorable investment experience to offset the deferred gain, it will be recognized in future years and the System's funded status is expected to improve. 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.

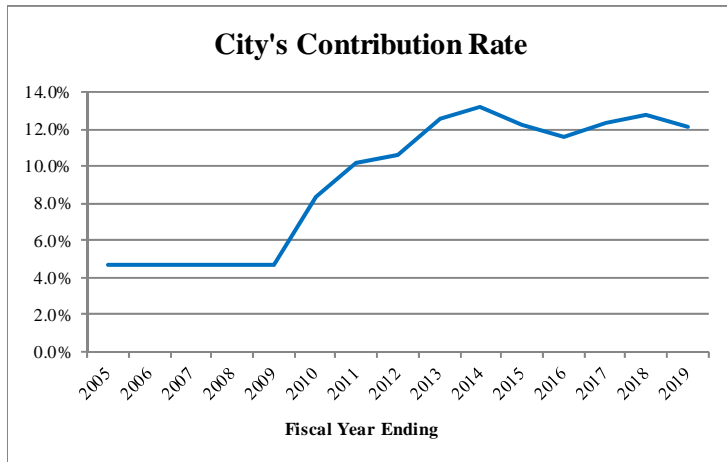
Contribution rates are computed with the objective of developing costs that are level as a percentage of covered payroll. The contribution rate for fiscal year 2019 is based on the December 31, 2017 actuarial valuation results.

As of December 31, 2017, 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 3.2% of pay. The City's contribution rate is the sum of employer normal cost rate and the UAL amortization contribution. This valuation indicates the City's contribution should be 12.1% of pay (8.9% employer normal cost rate plus 3.2% UAL contribution).



SECTION I: EXECUTIVE SUMMARY

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



After increasing from 2010 through 2014, the City's contribution rate has been more stable in the last few years. The City's contribution rate is 12.8% and 12.1% for the fiscal years ending 12/31/2018 and 12/31/2019, respectively.

COMMENTS

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 2017 was 17.0%. However, due to deferred asset losses, the return on the actuarial value of assets was 8.7%. Because the return on the actuarial value of assets is greater than the 7.75% assumed rate, the System experienced an actuarial gain on assets of \$5.3 million. This gain and the actuarial gain on liabilities of \$2.8 million resulted in a total actuarial gain of \$8.1 million.

The actuarial gain resulting from the favorable investment experience for the year ending December 31, 2017 was the main driver in the City's contribution rate decreasing from 12.8% in the December 31, 2016 valuation to 12.1% 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 7.75% assumption tends to create volatility in the City's contribution rate. 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 1.4% of payroll.

The deferred investment gain (market value of assets greater than actuarial value) is \$16 million as of December 31, 2017. Absent investment losses in future years, the deferred investment gain of \$16 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, 2017 actuarial valuation using both the actuarial and market value of assets (see table on next page).



SECTION I: EXECUTIVE SUMMARY

	Using Actuarial Value of Assets	Using Market Value of Assets
Actuarial Liability	\$634,907,255	\$634,907,255
Asset Value	598,793,422	614,778,032
Unfunded Actuarial Liability	36,113,833	20,129,223
Funded Ratio	94.3%	96.8%
Normal Cost Rate	13.6%	13.6%
UAL Contribution Rate	<u>3.2%</u>	<u>1.8%</u>
Total Contribution Rate	16.8%	15.4%
Employee Contribution Rate	<u>(4.7%)</u>	<u>(4.7%)</u>
Employer Contribution Rate	12.1%	10.7%

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.

**SECTION I: EXECUTIVE SUMMARY****SUMMARY OF PRINCIPAL RESULTS**

1. PARTICIPANT DATA	<u>12/31/2017</u> <u>Valuation</u>	<u>12/31/2016</u> <u>Valuation</u>	<u>%</u> <u>Change</u>
Number of:			
Active Members			
Plan 2	827	885	(6.6)%
Plan 3 (excluding Plan 3b)	647	617	4.9%
Total	<u>1,474</u>	<u>1,502</u>	(1.9)%
DROP Members			
Plan 1	3	3	0.0%
Plan 2	64	67	(4.5)%
Total	<u>67</u>	<u>70</u>	(4.3)%
Retired Members and Beneficiaries	1,416	1,393	1.7%
Inactive Vested Members	144	134	7.5%
Inactive Non-Vested Members	<u>36</u>	<u>25</u>	44.0%
Total Members	3,137	3,124	0.4%
Annual Projected Payroll (Including DROP)			
Plan 1	\$ 188,549	\$ 187,183	0.7%
Plan 2	52,655,338	54,003,707	(2.5)%
Plan 3	28,687,814	26,823,188	7.0%
Total	<u>\$ 81,531,701</u>	<u>\$ 81,014,078</u>	0.6%
Annual Projected Payments for Retired Members and Beneficiaries	\$ 40,486,416	\$ 39,273,756	3.1%
2. ASSETS AND LIABILITIES			
a. Total Actuarial Liability	\$ 634,907,255	\$ 620,218,925	2.4%
b. Market Value of Assets	614,778,032	549,786,949	11.8%
c. Actuarial Value of Assets	598,793,422	575,971,337	4.0%
d. Unfunded Actuarial Liability (a) - (c)	\$ 36,113,833	\$ 44,247,588	(18.4)%
e. Funded Ratio (c) / (a)	94.3%	92.9%	1.5%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost	13.6%	13.6%	0.0%
Member Financed	<u>(4.7)%</u>	<u>(4.7)%</u>	0.0%
Employer Normal Cost	8.9%	8.9%	0.0%
Amortization of Unfunded Actuarial Liability or (Surplus)	<u>3.2%</u>	<u>3.9%</u>	(17.9)%
Employer Contribution Rate	12.1%	12.8%	(5.5)%



SECTION II: SCOPE OF THE REPORT

This report presents the actuarial valuation of the Wichita Employees' Retirement System as of December 31, 2017. 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 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.



SECTION III: ASSETS

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, 2017. 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, 2017, the market value of assets for the System was \$615 million. Table 1 shows the System assets as of December 31, 2017 in total and by investment category. Table 2 summarizes the change in the market value of assets from December 31, 2016 to December 31, 2017.

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, 2017.



SECTION III: ASSETS

TABLE 1

Analysis of Net Assets at Market Value

	As of December 31, 2017	
	Amount (\$ Millions)	% of Total
Cash and Equivalents	\$ 0.0	0.0 %
Government Securities	3.5	0.6
Fixed Income	107.0	17.7
International Equity	187.0	30.8
Domestic Equity	219.0	36.1
Real Estate	43.4	7.2
Timber	27.0	4.5
Commodities	18.7	3.1
Receivables	0.7	0.1
Liabilities	(0.9)	(0.1)
Total Plans 1 and 2	<u>\$ 605.4</u>	<u>100.0 %</u>
Plan 3 Assets	\$ 9.4	
Net Assets (Plans 1, 2, and 3)*	\$ 614.8	

* Excludes assets for Plan 3b members.

**SECTION III: ASSETS****TABLE 2****Summary of Changes in Net Assets
During Year Ended December 31, 2017**

(Market Value)

	<u>Plans 1 & 2</u>	<u>Plan 3*</u>	<u>Total</u>
1. Market Value of Assets as of December 31, 2016	\$ 535,244,276	\$ 14,542,673	\$ 549,786,949
2. Adjustment to Tie to Audited Financial Statements	\$ 0	\$ 0	\$ 0
3. Contributions:			
a. Employee	\$ 2,443,036	\$ 1,239,020	\$ 3,682,056
b. Employer	8,403,369	1,239,171	9,642,540
c. Transfers	9,156,035	(9,347,327)	(191,292)
d. Total	<u>\$ 20,002,440</u>	<u>\$ (6,869,136)</u>	<u>\$ 13,133,304</u>
4. Investment Income:			
a. Interest and Dividends	\$ 9,672,413	\$ 256,237	\$ 9,928,650
b. Net Appreciation (Depreciation) in Fair Value	82,765,955	2,147,764	84,913,719
c. Commission Recapture	11,680	287	11,967
d. Net Securities Lending Income	107,342	2,910	110,252
e. Investment Expenses	(3,123,205)	(67,410)	(3,190,615)
f. Net Investment Income (Loss)	<u>\$ 89,434,185</u>	<u>\$ 2,339,788</u>	<u>\$ 91,773,973</u>
5. Expenditures:			
a. Refunds of Member Contributions	\$ 70,622	\$ 543,481	\$ 614,103
b. Benefits Paid:			
(1) Pension and Death Benefits	37,591,393	0	37,591,393
(2) DROP Payments	1,077,319	0	1,077,319
c. Administrative Expenses	582,762	50,617	633,379
d. Total	<u>\$ 39,322,096</u>	<u>\$ 594,098</u>	<u>\$ 39,916,194</u>
6. Net Change [3(d) + 4(f) - 5(d)]	\$ 70,114,529	\$ (5,123,446)	\$ 64,991,083
7. Market Value of Assets as of December 31, 2017 (1) + (2) + (6)	\$ 605,358,805	\$ 9,419,227	\$ 614,778,032

* Excludes assets for Plan 3b members. The December 31, 2017 market value of the assets for this group was \$8,496,194.



SECTION III: ASSETS

TABLE 3

**Development of Actuarial Value of Assets
as of December 31, 2017**

	<u>Plans 1 & 2</u>	<u>Plan 3*</u>	<u>Total</u>
1. Actuarial Value of Assets as of December 31, 2016	\$ 560,635,953	\$ 15,335,384	\$ 575,971,337
2. Actual Contributions/Disbursements			
a. Contributions	\$ 10,846,405	\$ 2,478,191	\$ 13,324,596
b. Transfers	9,156,035	(9,347,327)	(191,292)
c. Benefit Payments and Refunds	(38,739,334)	(543,481)	(39,282,815)
d. Net	\$ (18,736,894)	\$ (7,412,617)	\$ (26,149,511)
3. Expected Value of Assets as of December 31, 2017 [(1) * 1.0775] + [2(d) * (1.0775) ⁻⁵]	\$ 584,635,838	\$ 8,829,380	\$ 593,465,218
4. Market Value of Assets as of December 31, 2017	\$ 605,358,805	\$ 9,419,227	\$ 614,778,032
5. Difference Between Actual and Expected Values	\$ 20,722,967	\$ 589,847	\$ 21,312,814
6. Initial Actuarial Value of Assets (3) + [(5) * 0.25]	\$ 589,816,580	\$ 8,976,842	\$ 598,793,422
7. Corridor for Actuarial Value of Assets			
a. 80% of Market Value of Assets	\$ 484,287,044	\$ 7,535,382	\$ 491,822,426
b. 120% of Market Value of Assets	726,430,566	11,303,072	737,733,638
8. Actuarial Value of Assets as of December 31, 2017	\$ 589,816,580	\$ 8,976,842	\$ 598,793,422
9. Actuarial Value of Assets Divided by Market Value of Assets	97.4%	95.3%	97.4%
10. Market Value of Assets Less Actuarial Value of Assets	\$ 15,542,225	\$ 442,385	\$ 15,984,610

* Excludes Plan 3b



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, 2017. 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, 2017.

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.

**SECTION IV: SYSTEM LIABILITIES****TABLE 4****Present Value of Future Benefits (PVFB)
as of December 31, 2017**

	<u>Plan 1</u>	<u>Plan 2</u>	<u>Plan 3</u>	<u>Total</u>
1. Active Employees				
a. Retirement Benefit	\$ 0	\$ 221,202,376	\$ 43,408,448	\$ 264,610,824
b. Pre-Retirement Death Benefit	0	3,632,514	1,205,005	4,837,519
c. Withdrawal Benefit	0	9,478,061	6,961,734	16,439,795
d. Total	\$ 0	\$ 234,312,951	\$ 51,575,187	\$ 285,888,138
2. DROP Members				
a. DROP Account Balance	\$ 636,273	\$ 4,292,708	\$ 0	\$ 4,928,981
b. Monthly Retirement Benefit	1,592,727	26,283,766	0	27,876,493
c. Total	\$ 2,229,000	\$ 30,576,474	\$ 0	\$ 32,805,474
3. Inactive Vested Members	\$ 0	\$ 27,176,575	\$ 0	\$ 27,176,575
4. Inactive Nonvested Members	\$ 0	\$ 0	\$ 132,809	\$ 132,809
5. In Pay Members				
a. Retirees	\$ 195,459,762	\$ 140,085,352	\$ 0	\$ 335,545,114
b. Disabled Members	1,137,006	1,819,430	0	2,956,436
c. Beneficiaries	20,016,926	9,279,869	0	29,296,795
d. Total	\$ 216,613,694	\$ 151,184,651	\$ 0	\$ 367,798,345
6. Total Present Value of Future Benefits 1(d) + 2(c) + 3 + 4 + 5(d)	\$ 218,842,694	\$ 443,250,651	\$ 51,707,996	\$ 713,801,341



SECTION IV: SYSTEM LIABILITIES

TABLE 5

**Actuarial Liability
as of December 31, 2017**

	<u>Plan 1</u>	<u>Plan 2</u>	<u>Plan 3</u>	<u>Total</u>
1. Active Employees				
a. Present Value of Future Benefits	\$ 0	\$ 234,312,951	\$ 51,575,187	\$ 285,888,138
b. Present Value of Future Normal Costs	0	40,811,827	38,082,259	78,894,086
c. Actuarial Liability 1(a) - 1(b)	\$ 0	\$ 193,501,124	\$ 13,492,928	\$ 206,994,052
2. DROP Members	\$ 2,229,000	\$ 30,576,474	\$ 0	\$ 32,805,474
3. Inactive Vested Members	\$ 0	\$ 27,176,575	\$ 0	\$ 27,176,575
4. Inactive Nonvested Members	\$ 0	\$ 0	\$ 132,809	\$ 132,809
5. In Pay Members				
a. Retirees	\$ 195,459,762	\$ 140,085,352	\$ 0	\$ 335,545,114
b. Disabled Members	1,137,006	1,819,430	0	2,956,436
c. Beneficiaries	20,016,926	9,279,869	0	29,296,795
d. Total	\$ 216,613,694	\$ 151,184,651	\$ 0	\$ 367,798,345
6. Reserve for Plan 3 Members	\$ 0	\$ 0	\$ 0	\$ 0
7. Total Actuarial Liability 1(c) + 2 + 3 + 4 + 5(d) + 6	\$ 218,842,694	\$ 402,438,824	\$ 13,625,737	\$ 634,907,255



SECTION V: EMPLOYER CONTRIBUTIONS

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, 2017 actuarial valuation will be used to determine the employer contribution rate to the Wichita Employees’ Retirement System for fiscal year 2019. 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, 2017, 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 rolling 20-year period. The amortization of the UAL results in an employer contribution that is more than the employer normal cost rate. The rolling amortization period means the UAL is not expected to be fully funded in the future.

CONTRIBUTION RATE SUMMARY

In Table 6, the amortization payment related to the unfunded actuarial liability/(surplus), as of December 31, 2017, 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, 2017.

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



SECTION V: EMPLOYER CONTRIBUTIONS

TABLE 6

Derivation of Unfunded Actuarial Liability Contribution Rate

1. Actuarial Liability	\$	634,907,255
2. Actuarial Value of Assets	\$	598,793,422
3. Unfunded Actuarial Liability (UAL)	\$	36,113,833
4. Payment (Adjusted to Mid-Year) to Amortize Unfunded Actuarial Liability/(Surplus) Over 20 Years*	\$	2,570,264
5. Total Projected Payroll for the Year	\$	81,531,701
6. Amortization Payment as a Percent of Payroll		3.2%

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



SECTION V: EMPLOYER CONTRIBUTIONS

TABLE 7

Derivation of Normal Cost Rate

Normal Cost as of December 31, 2017	
Service Pensions	\$ 7,828,126
Survivor Pensions	241,940
Termination Benefits	<u>1,580,169</u>
Total Normal Cost	\$ 9,650,235
Expected Payroll in 2018 for Current Actives	\$ 70,750,710
Total Normal Cost Rate for Year	13.6%



SECTION V: EMPLOYER CONTRIBUTIONS

TABLE 8

**Employer Contribution Rate
for Fiscal Year Commencing in 2019**

	<u>Contribution Requirement as a % of Payroll</u>
Normal Cost	
Service pensions	11.1%
Survivor pensions	0.3%
Termination pensions	2.2%
Total Normal Cost	<u>13.6%</u>
Unfunded Actuarial Liability	
Retired members and beneficiaries ⁽¹⁾	0.0%
Active and former members ⁽²⁾	3.2%
Total UAL Contribution	<u>3.2%</u>
Total Contribution Requirement	
Member Financed Portion ⁽³⁾	4.7%
City Financed Portion	12.1%
Total	<u>16.8%</u>

⁽¹⁾ Actuarial liability for retired members and beneficiaries was fully funded as of December 31, 2017.

⁽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: 6.4% for Plan 1 and 4.7% for Plans 2 & 3.



SECTION V: EMPLOYER CONTRIBUTIONS

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, 2017, 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.

Valuation Date	Fiscal Year	City Contributions as Percents of Active Member Pensionable Payroll	
		Funding Objective	Amortization (Credit)/Payment
11/30/1992	1994	9.5%	0.0%
11/30/1993	1995	9.5	0.0
11/30/1994	1996	9.4	0.0
12/31/1995	1997	9.0	0.0
12/31/1996	1998	6.9 - 8.4	(1.5)
12/31/1997	1999	4.6 - 8.5	(3.9)
12/31/1998	2000	0.8 - 8.3	(7.5)
12/31/1999	2001	2.5 - 9.8	(7.3)
12/31/2000	2002	0.5 - 9.7	(9.2)
12/31/2001	2003	1.9 - 9.4	(7.5)
12/31/2002	2004	2.7 - 8.8	(6.1)
12/31/2003	2005	3.1 - 8.9	(5.8)
12/31/2004	2006	3.5 - 8.2	(4.7)
12/31/2005	2007	3.9 - 8.2	(4.3)
12/31/2006	2008	4.2 - 8.3	(4.1)
12/31/2007	2009	4.2 - 8.4	(4.2)
12/31/2008	2010	8.4	0.0
12/31/2009	2011	10.2	1.7
12/31/2010	2012	10.6	2.1
12/31/2011	2013	12.6	4.1
12/31/2012	2014	13.2	5.0
12/31/2013	2015	12.2	3.9
12/31/2014	2016	11.6	2.9
12/31/2015	2017	12.3	3.4
12/31/2016	2018	12.8	3.9
12/31/2017	2019	12.1	3.2



SECTION V: EMPLOYER CONTRIBUTIONS

TABLE 10

Derivation of System Experience Gain/(Loss)

Liabilities

1. Actuarial liability as of December 31, 2016	\$ 620,218,925
2. Normal cost as of December 31, 2016	9,632,102
3. Plan 3 members transferring to Plan 3b during 2017	(191,292)
4. Interest at 7.75% on (1), (2) and (3) to December 31, 2017	48,806,180
5. Benefit payments during 2017	(39,282,815)
6. Interest on benefit payments	(1,493,807)
7. Expected actuarial liability as of December 31, 2017	\$ 637,689,293
8. Actuarial liability as of December 31, 2017	\$ 634,907,255

Assets

9. Actuarial value of assets as of December 31, 2016	\$ 575,971,337
10. Contributions during 2017	13,324,596
11. Benefit payments during 2017	(39,282,815)
12. Plan 3 members transferring to Plan 3b during 2017	(191,292)
13. Interest on items (9), (10), (11) and (12)	43,643,392
14. Expected actuarial value of assets as of December 31, 2017	\$ 593,465,218
15. Actual actuarial value of assets as of December 31, 2017	\$ 598,793,422

Gain / (Loss)

16. Expected unfunded actuarial liability (7) – (14)	\$ 44,224,075
17. Actual unfunded actuarial liability (8) – (15)	\$ 36,113,833
18. Actuarial Gain / (Loss) (16) – (17)	\$ 8,110,242
19. Actuarial Gain / (Loss) on Actuarial Assets (15) – (14)	\$ 5,328,204
20. Actuarial Gain / (Loss) on Actuarial Liability (7) – (8)	\$ 2,782,038



SECTION VI: OTHER INFORMATION

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, 2017. Significant actuarial assumptions used in determining the actuarial liability include:

- (a) A rate of return on the investment of present and future assets of 7.75% per year compounded annually,
- (b) Projected salary increases of 4.00% per year compounded annually, (3.25% attributable to inflation, and 0.75% attributable to productivity),
- (c) Additional projected salary increases of 0.25% to 3.20% per year attributable to seniority/merit, and
- (d) The assumption that benefits will increase 3.00% per year, non-compounded, for Plan 1 members and 2.00% per year of retirement, non-compounded, for Plan 2 members.

Actuarial Liability:

Active members	\$ 206,994,052
DROP members	32,805,474
Retired members and beneficiaries currently receiving benefits	367,798,345
Nonvested terminated members due a refund	132,809
Vested terminated members not yet receiving benefits	<u>27,176,575</u>
Total Actuarial Liability	\$ 634,907,255
Actuarial Value of Assets (market value was \$614,778,032)	\$ 598,793,422
Unfunded Actuarial Liability	\$ 36,113,833

During the year ended December 31, 2017, the System experienced a net increase of \$15 million in the actuarial liability.



SECTION VI: OTHER INFORMATION

TABLE 11

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	\$182,186	\$204,730	\$22,544	89.0 %	\$49,552	45.5 %
11/30/1993	200,853	218,603	17,750	91.9	52,093	34.1
11/30/1994	215,385	230,217	14,832	93.6	52,169	28.4
12/31/1995	238,441	242,354	3,913	98.4	54,039	7.2
12/31/1996	266,404	252,968	(13,436)	105.3	53,534	(25.1)
12/31/1997	296,705	263,573	(33,132)	112.6	54,346	(61.0)
12/31/1998	340,417	276,980	(63,437)	122.9	56,093	(113.1)
12/31/1999 *	383,338	319,289	(64,049)	120.1	57,562	(111.3)
12/31/2000	414,643	329,390	(85,253)	125.9	61,112	(139.5)
12/31/2001	428,204	353,158	(75,046)	121.2	65,347	(114.8)
12/31/2002	433,366	370,399	(62,967)	117.0	68,117	(92.4)
12/31/2003	446,794	387,037	(59,757)	115.4	69,161	(86.4)
12/31/2004 *	462,994	413,159	(49,835)	112.1	72,154	(69.1)
12/31/2005 *	479,275	433,297	(45,978)	110.6	72,367	(63.5)
12/31/2006 *	505,756	459,062	(46,694)	110.2	75,881	(61.5)
12/31/2007 *	533,911	483,387	(50,524)	110.5	78,736	(64.2)
12/31/2008 *	512,853	512,374	(479)	100.1	81,580	(0.6)
12/31/2009 *	509,494	529,271	19,777	96.3	82,704	23.9
12/31/2010 *	516,308	540,436	24,128	95.5	79,636	30.3
12/31/2011 *	513,298	555,174	41,876	92.5	75,444	55.5
12/31/2012	520,320	571,805	51,485	91.0	70,783	72.7
12/31/2013	542,157	582,386	40,228	93.1	70,953	56.7
12/31/2014 *	560,032	590,115	30,083	94.9	71,391	42.1
12/31/2015	568,464	605,855	37,391	93.8	74,028	50.5
12/31/2016	575,971	620,219	44,248	92.9	77,121	57.4
12/31/2017	598,793	634,907	36,114	94.3	78,395	46.1

Rounded dollar amounts are in thousands.

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

** After changes in benefits and/or actuarial assumptions and/or actuarial cost methods.*

*** From 2002 forward, includes all members except Plan 3b.*

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.



SECTION VI: OTHER INFORMATION

TABLE 12

Schedule of Employer Contributions

Fiscal Year	Actuarial Valuation Date	Annual Required Contribution*	Percent Contributed
1997	12/31/1995	\$4,459,654	100 %
1998	12/31/1996	4,140,163	100
1999	12/31/1997	4,134,826	100
2000	12/31/1998	2,751,084	100
2001	12/31/1999	1,843,213	100
2002	12/31/2000	3,137,912	100
2003	12/31/2001	3,189,513	100
2004	12/31/2002	3,266,706	100
2005	12/31/2003	3,589,063	100
2006	12/31/2004	3,566,429	100
2007	12/31/2005	3,700,590	100
2008	12/31/2006	3,834,270	100
2009	12/31/2007	3,887,085	100
2010	12/31/2008	6,689,450	100
2011	12/31/2009	7,695,317	100
2012	12/31/2010	7,503,003	100
2013	12/31/2011	8,940,135	100
2014	12/31/2012	9,423,640	100
2015	12/31/2013	9,031,463	100
2016	12/31/2014	8,946,064	100
2017	12/31/2015	9,642,540	100

* From 2002 forward, excludes contributions for Plan 3b members.

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

Summary of Actuarial Methods and Assumptions

Valuation Date	December 31, 2017
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level percent of payroll, open
Remaining Amortization Period	20 years
Asset Valuation Method	Expected + 25% of (Market – Expected Values)
Actuarial Assumptions:	
Investment Rate of Return*	7.75%
Projected Salary Increases*	4.25% - 7.20%
Cost-of-Living Adjustment Provisions	3.00% Non-compounded (Plan 1) 2.00% Non-compounded (Plan 2)

*Includes inflation at 3.25%



SECTION VI: OTHER INFORMATION

TABLE 13
Solvency Test

Valuation Date	Aggregate Actuarial Liability For				Portion of Actuarial Liabilities Covered by Reported Assets					
	(1)	(2)	(3)	Reported Valuation Assets	(1)		(2)		(3)	
	Active Member Contributions	Retirants and Beneficiaries*	Active Members (Employer Financed Portion)		%	%	%	%	%	
12/31/1995	\$28,549,082	\$123,759,638	\$90,046,029	\$238,441,351	100.0	%	100.0	%	95.7	%
12/31/1996	28,996,944	133,093,326	90,877,809	266,403,759	100.0		100.0		114.8	
12/31/1997	29,881,922	141,922,445	91,768,436	296,704,769	100.0		100.0		136.1	
12/31/1998	29,694,389	156,764,183	90,521,375	340,417,265	100.0		100.0		170.1	
12/31/1999	32,017,194	169,602,958	117,669,351	383,337,991	100.0		100.0		154.4	
12/31/2000	34,189,528	177,095,907	118,104,491	414,642,694	100.0		100.0		172.2	
12/31/2001	33,516,616	179,374,487	140,266,410	428,204,828	100.0		100.0		153.5	
12/31/2002	38,291,472	192,615,216	139,492,410	433,365,890	100.0		100.0		145.1	
12/31/2003	39,847,119	205,799,341	141,390,445	446,794,052	100.0		100.0		142.3	
12/31/2004	41,852,724	218,518,676	152,632,267	462,994,047	100.0		100.0		132.8	
12/31/2005	43,397,403	228,408,201	161,491,272	479,274,508	100.0		100.0		128.5	
12/31/2006	45,475,389	237,860,848	175,725,905	505,755,995	100.0		100.0		126.6	
12/31/2007	46,189,489	256,374,002	180,823,537	533,911,465	100.0		100.0		127.9	
12/31/2008	46,541,280	272,176,420	193,655,822	512,853,345	100.0		100.0		100.2	
12/31/2009	49,152,328	279,396,973	200,722,170	509,493,888	100.0		100.0		90.1	
12/31/2010	50,473,365	293,227,477	196,734,871	516,307,845	100.0		100.0		87.7	
12/31/2011	45,440,569	349,202,490	160,530,664	513,298,382	100.0		100.0		73.9	
12/31/2012	49,519,050	347,350,296	174,936,109	520,320,051	100.0		100.0		70.6	
12/31/2013	50,337,976	362,224,034	169,823,819	542,157,342	100.0		100.0		76.3	
12/31/2014	51,408,059	369,926,908	168,780,115	560,031,764	100.0		100.0		82.2	
12/31/2015	51,609,961	378,186,127	176,058,606	568,464,178	100.0		100.0		78.8	
12/31/2016	53,587,062	385,231,766	181,400,097	575,971,337	100.0		100.0		75.6	
12/31/2017	55,050,806	395,107,729	184,748,720	598,793,422	100.0		100.0		80.5	

* Includes vested and nonvested terminated members.

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

During the twelve months ended December 31, 2017, the Wichita Employees' Retirement System generated an actuarial gain of \$8.1 million. This amount is 1.3% of the actuarial liability at the beginning of the year.



APPENDIX A: SUMMARY OF MEMBERSHIP DATA

MEMBER DATA RECONCILIATION

December 31, 2016 to December 31, 2017

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*		DROP Participants		Retirees, Beneficiaries and Disableds		Inactive Vested*	Inactive Non-Vested	Total
	Plan 2	Plan 3	Plan 1	Plan 2	Plan 1	Plan 2	Plan 2	Plan 3	
Members as of 12/31/2016	885	617	3	67	717	676	134	25	3,124
New Members	0	+130	0	0	+8	+8	0	0	+146
Transfers	+11	-12	0	0	0	0	0	0	-1
Rehires	0	0	0	0	0	0	0	0	0
Terminations									
Refunded	-2	-54	0	0	0	0	-4	-22	-82
Refund Due	-6	-33	0	0	0	0	+6	+33	0
Deferred Vested	-18	0	0	0	0	0	+18	0	0
Retirements									
Service	-26	0	0	-19	0	+55	-10	0	0
Disability	0	0	0	0	0	0	0	0	0
DROP	-16	0	0	+16	0	0	0	0	0
Payment Ended	0	0	0	0	-1	-1	0	0	-2
Deaths									
Cashed Out	0	0	0	0	0	0	0	0	0
With Beneficiary	0	0	0	0	-8	-8	0	0	-16
Without Beneficiary	-1	-1	0	0	-25	-5	0	0	-32
Data Adjustments	0	0	0	0	0	0	0	0	0
Members as of 12/31/2017	827	647	3	64	691	725	144	36	3,137

* There are no active or inactive vested members benefiting under Plan 1.



APPENDIX A: SUMMARY OF MEMBERSHIP DATA

HISTORICAL ACTIVE DATA
(Including DROP Members)
as of December 31, 2017

Valuation Date	Number of Members			Total	Annual Covered Payroll (\$000's) ²	Average Annual Pay	% Increase In Average Annual Pay
	Plan 1	Plan 2	Plan 3 ¹				
12/31/2005	151	900	822	1,873	\$72,367	\$38,637	(1.0) %
12/31/2006	134	922	837	1,893	75,881	40,085	3.7
12/31/2007	113	947	838	1,898	78,736	41,484	3.5
12/31/2008	92	958	852	1,902	81,580	42,892	3.4
12/31/2009	80	998	740	1,818	82,704	45,492	6.1
12/31/2010	61	993	661	1,715	79,636	46,435	2.1
12/31/2011	31	916	611	1,558	75,444	48,424	4.3
12/31/2012	26	950	527	1,503	70,783	47,094	(2.7)
12/31/2013	15	957	517	1,489	70,952	49,068	4.2
12/31/2014	8	989	520	1,517	71,391	47,061	(4.1)
12/31/2015	5	988	539	1,532	74,028	48,321	2.7
12/31/2016	3	952	617	1,572	77,121	49,059	1.5
12/31/2017	3	891	647	1,541	78,395	50,873	3.7

¹ Does not include Plan 3b members.

² Actual covered payroll for year ending on valuation date.



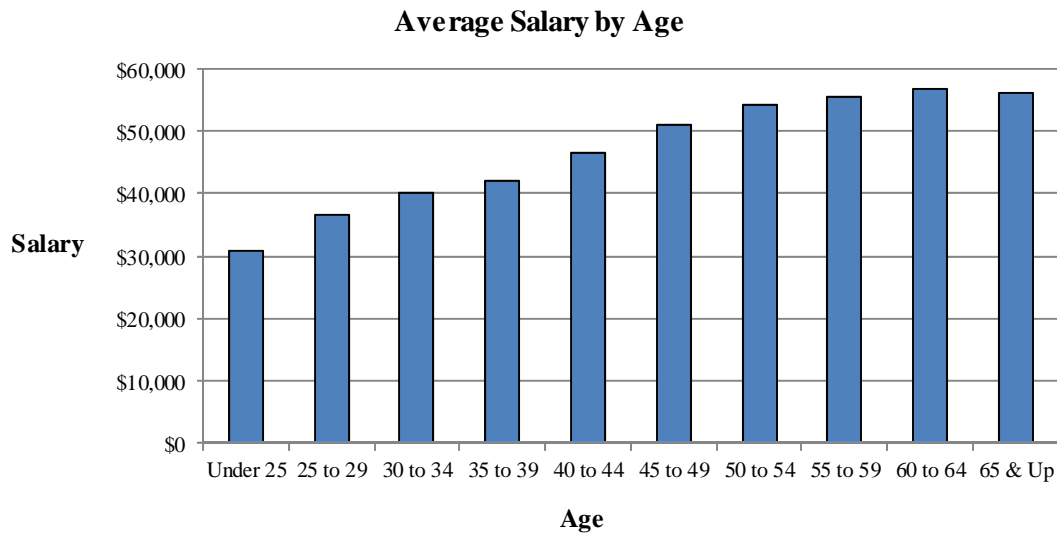
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

**SUMMARY OF ACTIVE MEMBERS
(Excluding DROP Members)
as of December 31, 2017**

All Plans

Age	Number			Valuation Salaries*		
	Male	Female	Total	Male	Female	Total
Under 25	23	10	33	\$ 695,937	\$ 323,295	\$ 1,019,232
25 to 29	64	34	98	2,278,278	1,301,586	3,579,864
30 to 34	87	47	134	3,457,099	1,942,827	5,399,926
35 to 39	86	49	135	3,572,592	2,108,330	5,680,922
40 to 44	92	74	166	4,114,701	3,616,471	7,731,172
45 to 49	111	74	185	5,787,159	3,683,030	9,470,189
50 to 54	153	88	241	8,303,439	4,785,715	13,089,154
55 to 59	160	97	257	9,090,862	5,215,326	14,306,188
60 to 64	115	66	181	6,597,271	3,665,622	10,262,893
65 & Up	25	19	44	1,448,471	1,017,606	2,466,077
Total	916	558	1,474	\$45,345,809	\$27,659,808	\$73,005,617

* Actual salary as reported by System for year ending 12/31/2017.





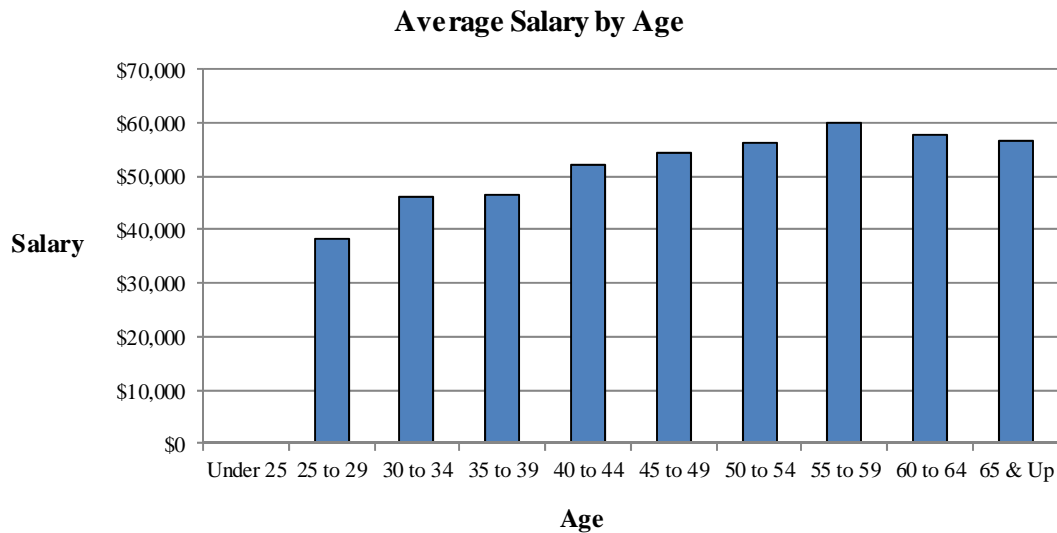
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

**SUMMARY OF ACTIVE MEMBERS
(Excluding DROP Members)
as of December 31, 2017**

Plan 2

Age	Number			Valuation Salaries*		
	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	\$ 0	\$ 0	\$ 0
25 to 29	1	1	2	45,428	31,159	76,587
30 to 34	18	5	23	813,863	244,751	1,058,614
35 to 39	36	13	49	1,666,179	604,800	2,270,979
40 to 44	44	34	78	2,145,350	1,927,100	4,072,450
45 to 49	66	47	113	3,659,061	2,482,241	6,141,302
50 to 54	121	63	184	6,815,699	3,548,140	10,363,839
55 to 59	119	75	194	7,313,369	4,333,946	11,647,315
60 to 64	95	57	152	5,498,265	3,263,108	8,761,373
65 & Up	16	16	32	979,866	828,415	1,808,281
Total	516	311	827	\$28,937,080	\$17,263,660	\$46,200,740

* Actual salary as reported by System for year ending 12/31/2017.





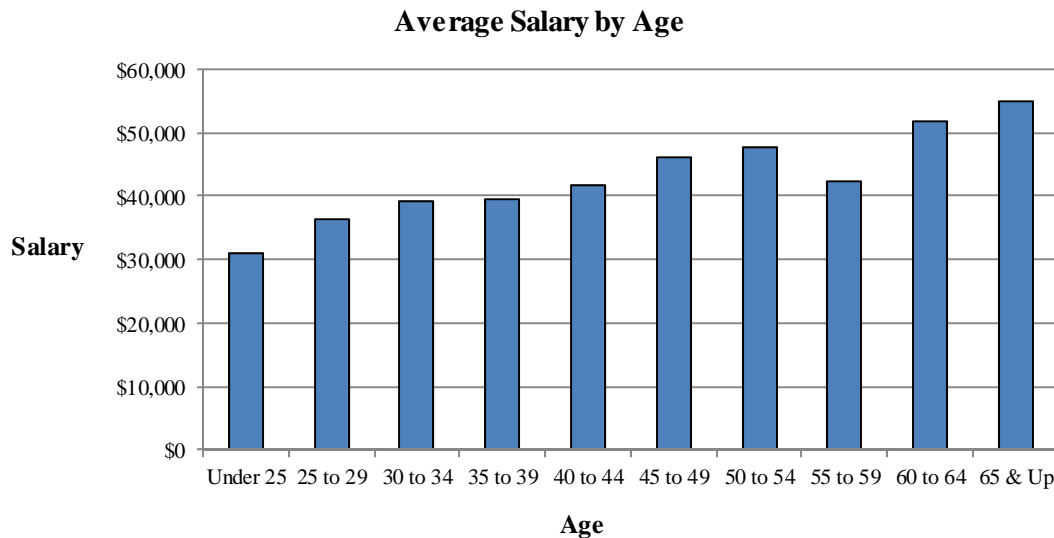
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF ACTIVE MEMBERS
as of December 31, 2017

Plan 3

Age	Number			Valuation Salaries*		
	Male	Female	Total	Male	Female	Total
Under 25	23	10	33	\$ 695,937	\$ 323,295	\$ 1,019,232
25 to 29	63	33	96	2,232,850	1,270,427	3,503,277
30 to 34	69	42	111	2,643,236	1,698,076	4,341,312
35 to 39	50	36	86	1,906,413	1,503,530	3,409,943
40 to 44	48	40	88	1,969,351	1,689,371	3,658,722
45 to 49	45	27	72	2,128,098	1,200,789	3,328,887
50 to 54	32	25	57	1,487,740	1,237,575	2,725,315
55 to 59	41	22	63	1,777,493	881,380	2,658,873
60 to 64	20	9	29	1,099,006	402,514	1,501,520
65 & Up	9	3	12	468,605	189,191	657,796
Total	400	247	647	\$16,408,729	\$10,396,148	\$26,804,877

* Actual salary as reported by System for year ending 12/31/2017.





APPENDIX A: SUMMARY OF MEMBERSHIP DATA

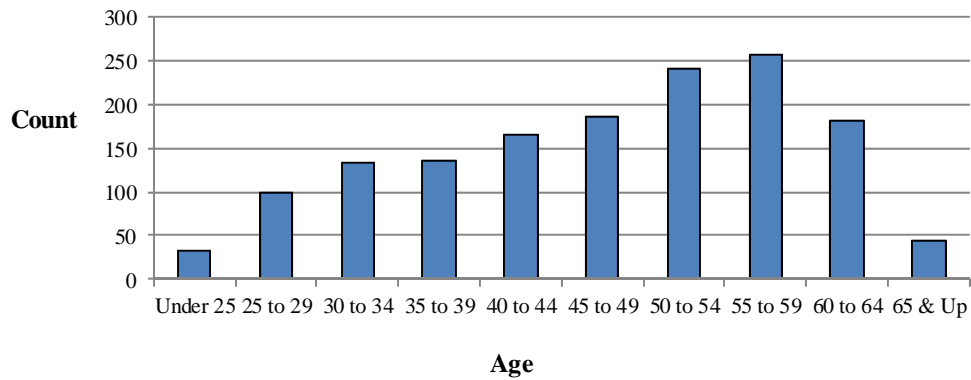
**DISTRIBUTION OF ACTIVE MEMBERS
(Excluding DROP Members)
as of December 31, 2017**

All Plans

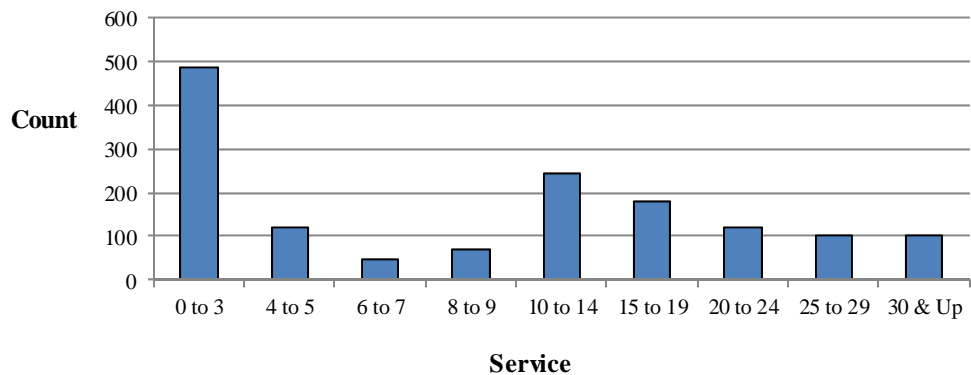
Years of Service

Age	0 to 3	4 to 5	6 to 7	8 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	Total
Under 25	33	0	0	0	0	0	0	0	0	33
25 to 29	80	14	3	0	1	0	0	0	0	98
30 to 34	89	17	7	6	15	0	0	0	0	134
35 to 39	57	22	7	8	29	12	0	0	0	135
40 to 44	64	20	5	10	38	22	7	0	0	166
45 to 49	53	16	5	10	34	36	23	8	0	185
50 to 54	44	8	7	9	45	40	28	42	18	241
55 to 59	40	15	9	9	40	35	34	33	42	257
60 to 64	20	6	4	14	28	31	22	18	38	181
65 & Up	8	3	1	3	14	6	6	1	2	44
Total	488	121	48	69	244	182	120	102	100	1,474

Age Distribution



Service Distribution





APPENDIX A: SUMMARY OF MEMBERSHIP DATA

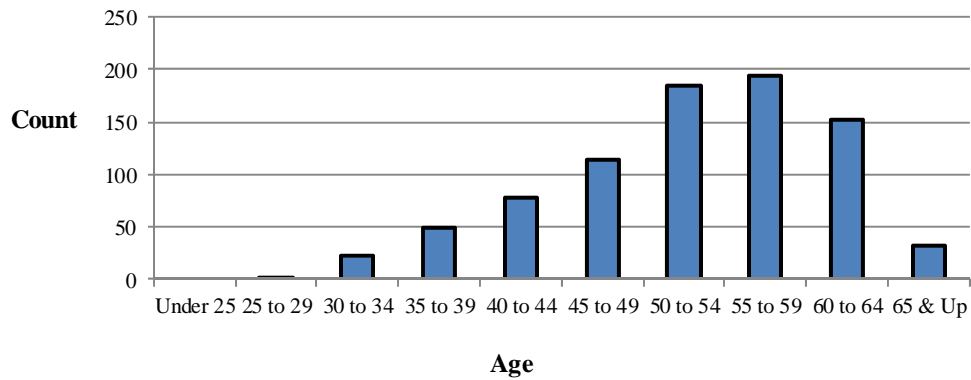
DISTRIBUTION OF ACTIVE MEMBERS
(Excluding DROP Members)
as of December 31, 2017

Plan 2

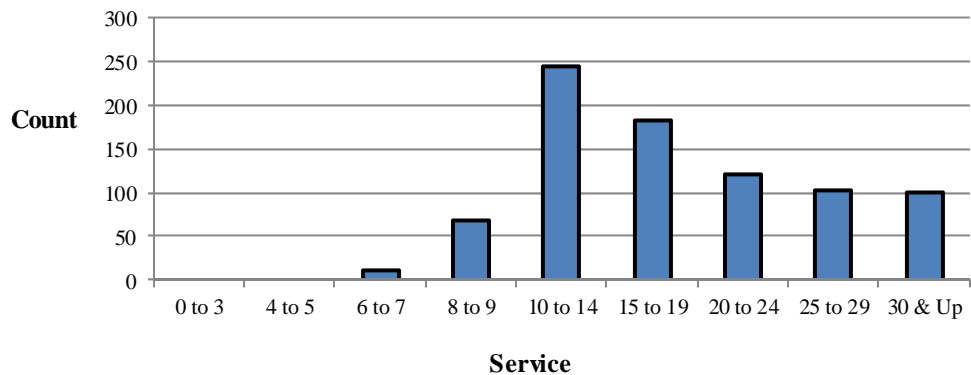
Years of Service

Age	0 to 3	4 to 5	6 to 7	8 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	Total
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	1	0	1	0	0	0	0	2
30 to 34	0	0	2	6	15	0	0	0	0	23
35 to 39	0	0	0	8	29	12	0	0	0	49
40 to 44	0	0	1	10	38	22	7	0	0	78
45 to 49	0	0	2	10	34	36	23	8	0	113
50 to 54	0	0	2	9	45	40	28	42	18	184
55 to 59	0	0	1	9	40	35	34	33	42	194
60 to 64	0	0	1	14	28	31	22	18	38	152
65 & Up	0	0	0	3	14	6	6	1	2	32
Total	0	0	10	69	244	182	120	102	100	827

Age Distribution



Service Distribution





APPENDIX A: SUMMARY OF MEMBERSHIP DATA

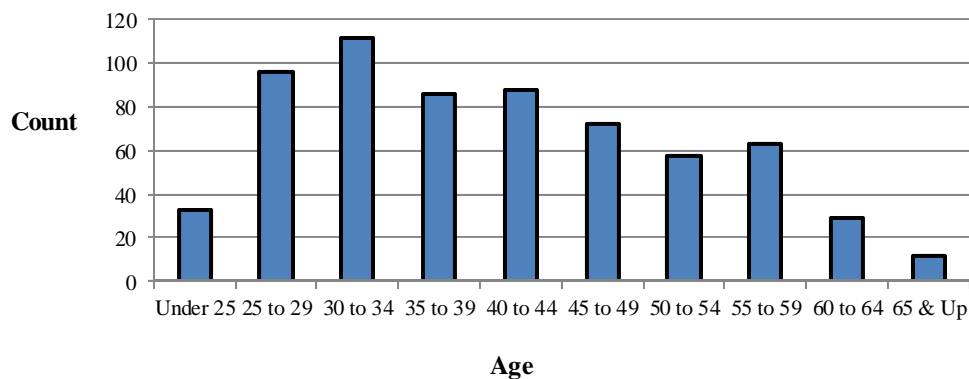
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2017

Plan 3

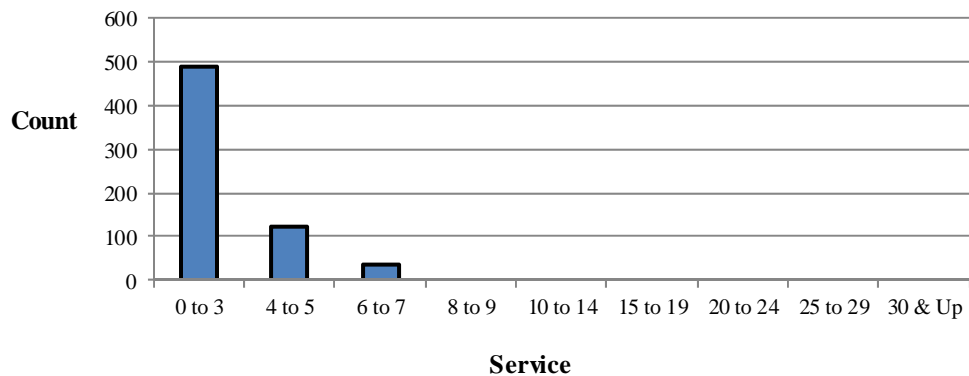
Years of Service

Age	0 to 3	4 to 5	6 to 7	8 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	Total
Under 25	33	0	0	0	0	0	0	0	0	33
25 to 29	80	14	2	0	0	0	0	0	0	96
30 to 34	89	17	5	0	0	0	0	0	0	111
35 to 39	57	22	7	0	0	0	0	0	0	86
40 to 44	64	20	4	0	0	0	0	0	0	88
45 to 49	53	16	3	0	0	0	0	0	0	72
50 to 54	44	8	5	0	0	0	0	0	0	57
55 to 59	40	15	8	0	0	0	0	0	0	63
60 to 64	20	6	3	0	0	0	0	0	0	29
65 & Up	8	3	1	0	0	0	0	0	0	12
Total	488	121	38	0	0	0	0	0	0	647

Age Distribution



Service Distribution





APPENDIX A: SUMMARY OF MEMBERSHIP DATA

DISTRIBUTION OF DROP MEMBERS
as of December 31, 2017

Plan 1

Age	Service					Total
	Under 20	20 to 24	25 to 29	30 to 34	35 & Up	
Under 50	0	0	0	0	0	0
50-54	0	0	0	0	0	0
55-59	0	0	0	0	0	0
60-64	0	0	0	0	0	0
65 & Up	0	0	0	2	1	3
Total	0	0	0	2	1	3

Age	DROP Duration Elected (months)					Total
	1 to 12	13 to 24	25 to 36	37 to 48	49 to 60	
Under 50	0	0	0	0	0	0
50-54	0	0	0	0	0	0
55-59	0	0	0	0	0	0
60-64	0	0	0	0	0	0
65 & Up	0	0	0	0	3	3
Total	0	0	0	0	3	3

Age	Monthly Benefits	Current Balance
Under 50	\$ 0	\$ 0
50-54	0	0
55-59	0	0
60-64	0	0
65 & Up	12,291	636,273
Total	\$ 12,291	\$ 636,273

Covered Payroll \$180,863



APPENDIX A: SUMMARY OF MEMBERSHIP DATA

DISTRIBUTION OF DROP MEMBERS

as of December 31, 2017

Plan 2

Age	Service					Total
	Under 20	20 to 24	25 to 29	30 to 34	35 & Up	
Under 50	0	0	0	0	0	0
50-54	0	0	0	0	0	0
55-59	0	0	0	0	0	0
60-64	10	9	8	6	10	43
65 & Up	6	3	5	6	1	21
Total	16	12	13	12	11	64

Age	DROP Duration Elected (months)					Total
	1 to 12	13 to 24	25 to 36	37 to 48	49 to 60	
Under 50	0	0	0	0	0	0
50-54	0	0	0	0	0	0
55-59	0	0	0	0	0	0
60-64	0	5	8	18	12	43
65 & Up	0	3	3	4	11	21
Total	0	8	11	22	23	64

Age	Monthly Benefits	Current Balance
Under 50	\$ 0	\$ 0
50-54	0	0
55-59	0	0
60-64	120,181	1,973,207
65 & Up	64,306	2,319,501
Total	\$ 184,487	\$ 4,292,708

Covered Payroll \$4,012,032



APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF INACTIVE VESTED MEMBERS
as of December 31, 2017

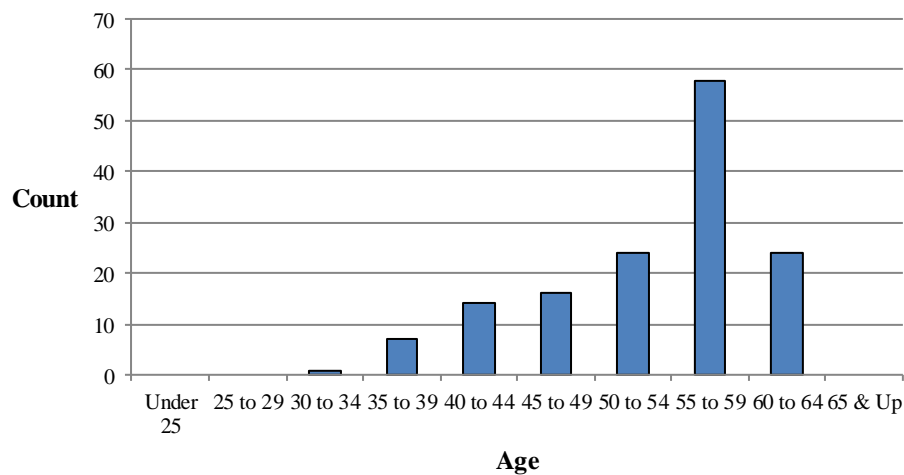
All Plans*

Age	Number**			Current Monthly 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	1	1	0	404	404
35 to 39	6	1	7	4,155	948	5,103
40 to 44	9	5	14	10,358	7,063	17,421
45 to 49	9	7	16	11,093	9,211	20,304
50 to 54	10	14	24	14,133	27,565	41,698
55 to 59	33	25	58	54,456	48,384	102,840
60 to 64	11	13	24	20,517	22,909	43,426
65 & Up	0	0	0	0	0	0
Total	78	66	144	\$ 114,712	\$ 116,484	\$ 231,196

* All Inactive Vested Members are Plan 2 Members.

** Includes 6 Inactive Vested Members who have elected to receive a refund of contributions, but have not been paid yet.

Age Distribution





APPENDIX A: SUMMARY OF MEMBERSHIP DATA

DISTRIBUTION OF IN-PAY MEMBERS

as of December 31, 2017

Amount of Monthly Benefit	Active in DROP	Non-Service Disability	QDRO ¹	Service	Service Disability	Survivor	Total
\$ 0-500	0	2	2	55	0	72	131
500-1,000	1	9	5	147	1	68	231
1,000-1,500	9	3	2	144	0	66	224
1,500-2,000	6	2	0	154	2	41	205
2,000-2,500	13	2	1	115	1	20	152
2,500-3,000	7	0	1	91	0	3	102
3,000-3,500	12	0	0	110	0	4	126
3,500-4,000	8	0	0	87	0	0	95
4,000-4,500	1	0	0	74	0	0	75
4,500-5,000	5	0	0	48	0	0	53
>5,000	5	0	0	83	0	1	89
Total	67	18	11	1,108	4	275	1,483

¹ *Qualified Domestic Relations Order*



APPENDIX A: SUMMARY OF MEMBERSHIP DATA

**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	58	\$1,256,205	40	\$403,572	1,080	\$22,803,853	\$21,115	5.3 %
12/31/2006	63	1,205,241	41	580,114	1,102	24,146,982	21,912	3.8
12/31/2007	77	1,763,901	47	665,077	1,132	25,757,557	22,754	3.8
12/31/2008	79	1,879,045	44	693,343	1,167	27,520,308	23,582	3.6
12/31/2009	66	1,338,875	52	708,830	1,181	28,730,505	24,327	3.2
12/31/2010	71	1,847,020	59	949,872	1,193	29,855,835	25,026	2.9
12/31/2011	164	4,305,336	47	824,103	1,310	32,885,454	25,103	0.3
12/31/2012	50	1,010,373	58	1,036,870	1,302	31,730,663	24,371	(2.9)
12/31/2013	72	1,676,296	47	744,036	1,327	33,294,857	25,090	3.0
12/31/2014	68	1,549,070	54	927,726	1,341	34,427,388	25,673	2.3
12/31/2015	90	1,830,381	51	1,132,754	1,380	35,726,088	25,888	0.8
12/31/2016	78	1,730,868	65	1,194,869	1,393	36,931,056	26,512	2.4
12/31/2017	71	1,678,547	48	1,153,410	1,416	38,125,080	26,924	1.6

¹ Values are estimated based on annualized pension amounts.

Note: Counts exclude DROP participants



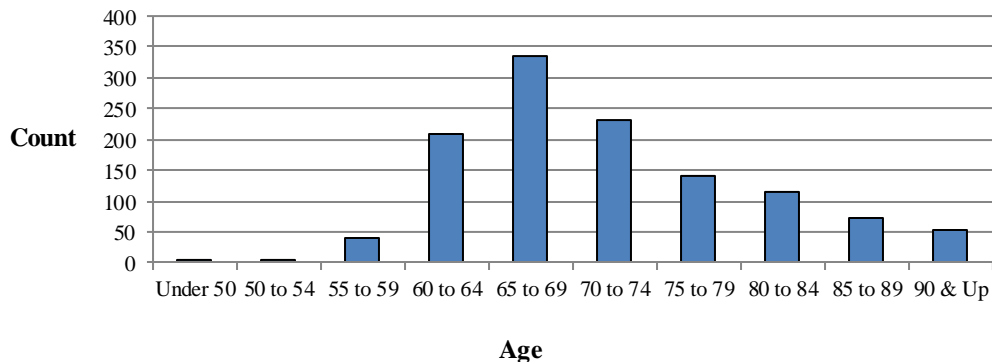
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF RETIRED MEMBERS*
as of December 31, 2017

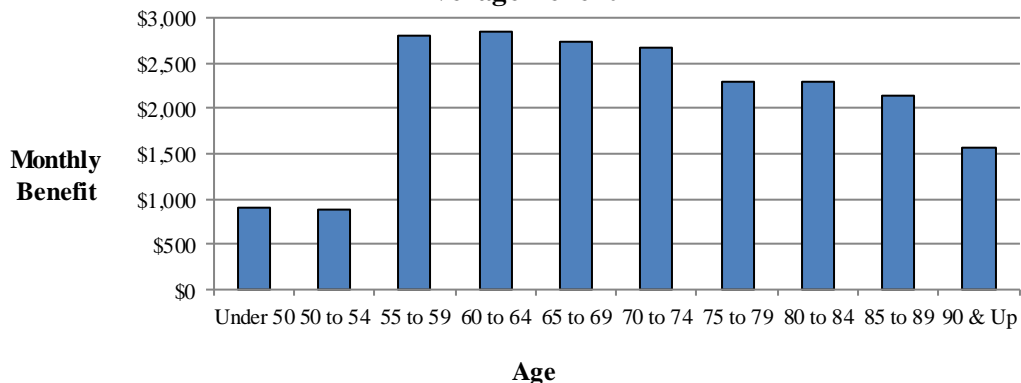
All Plans

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 50	1	0	1	\$ 897	\$ 0	\$ 897
50 to 54	0	1	1	0	893	893
55 to 59	27	13	40	80,904	30,815	111,719
60 to 64	119	90	209	352,353	241,937	594,290
65 to 69	219	115	334	646,467	265,082	911,549
70 to 74	134	97	231	417,144	200,058	617,202
75 to 79	79	61	140	211,297	110,651	321,948
80 to 84	61	55	116	160,544	106,501	267,045
85 to 89	41	32	73	98,628	57,921	156,549
90 & Up	21	31	52	46,676	35,265	81,941
Total	702	495	1,197	\$ 2,014,910	\$ 1,049,123	\$ 3,064,033

Age Distribution



Average Benefit



*Includes DROP members



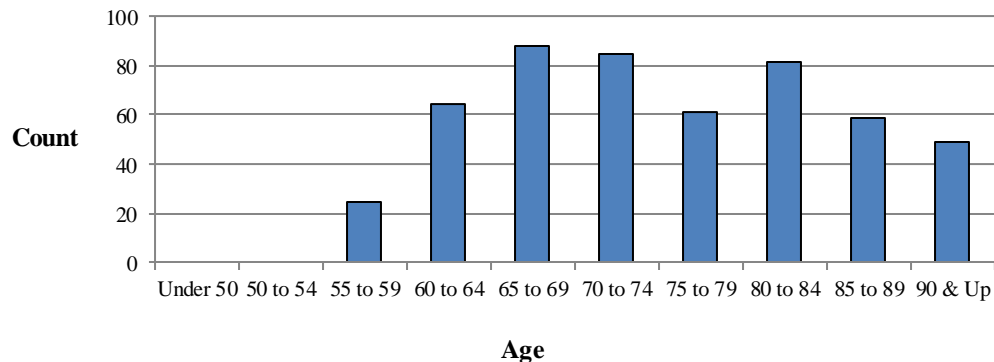
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF RETIRED MEMBERS*
as of December 31, 2017

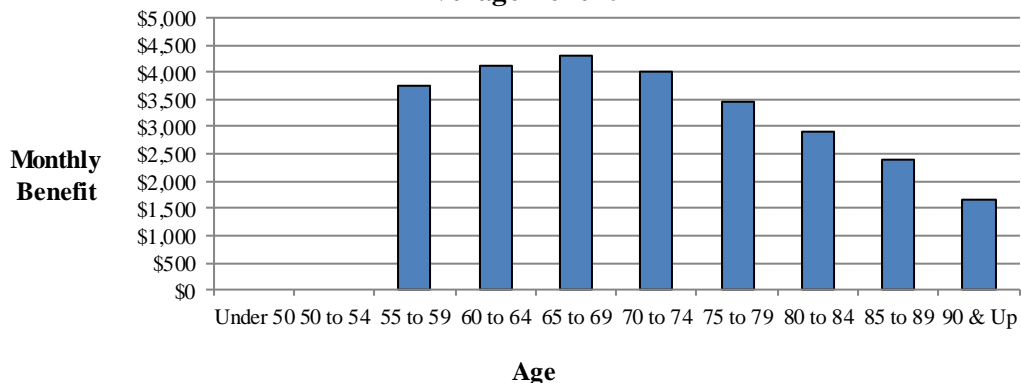
Plan 1

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 50	0	0	0	\$ 0	\$ 0	\$ 0
50 to 54	0	0	0	0	0	0
55 to 59	17	8	25	68,663	25,414	94,077
60 to 64	40	24	64	171,233	93,236	264,469
65 to 69	66	22	88	300,130	79,027	379,157
70 to 74	55	30	85	247,245	92,733	339,978
75 to 79	41	20	61	156,491	53,805	210,296
80 to 84	45	36	81	145,957	88,055	234,012
85 to 89	33	26	59	89,307	52,853	142,160
90 & Up	20	29	49	46,384	34,552	80,936
Total	317	195	512	\$ 1,225,410	\$ 519,675	\$ 1,745,085

Age Distribution



Average Benefit



*Includes DROP members



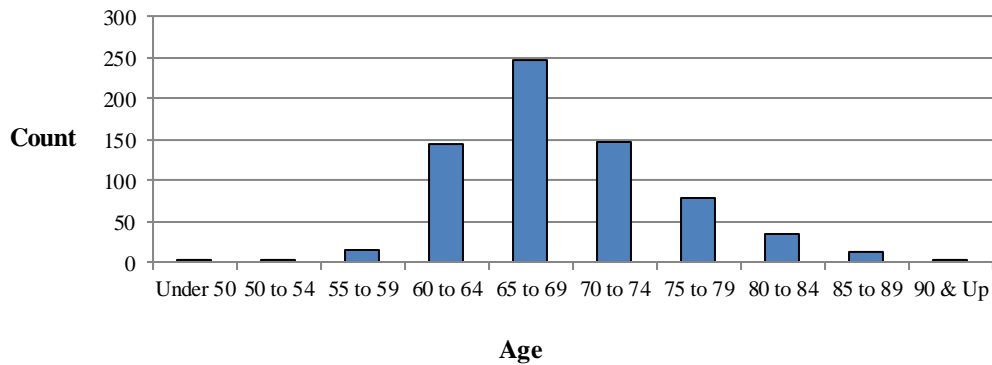
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF RETIRED MEMBERS*
as of December 31, 2017

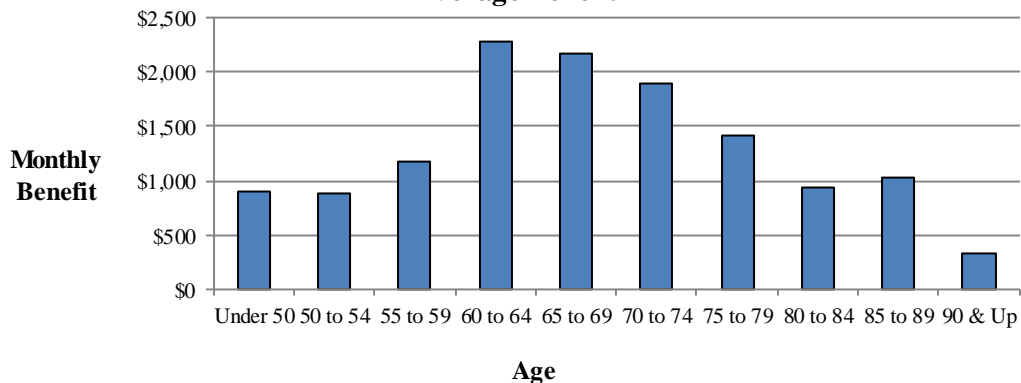
Plan 2

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 50	1	0	1	\$ 897	\$ 0	\$ 897
50 to 54	0	1	1	0	893	893
55 to 59	10	5	15	12,241	5,401	17,642
60 to 64	79	66	145	181,120	148,701	329,821
65 to 69	153	93	246	346,337	186,055	532,392
70 to 74	79	67	146	169,899	107,325	277,224
75 to 79	38	41	79	54,806	56,846	111,652
80 to 84	16	19	35	14,587	18,446	33,033
85 to 89	8	6	14	9,321	5,068	14,389
90 & Up	1	2	3	292	713	1,005
Total	385	300	685	\$ 789,500	\$ 529,448	\$ 1,318,948

Age Distribution



Average Benefit



*Includes DROP members



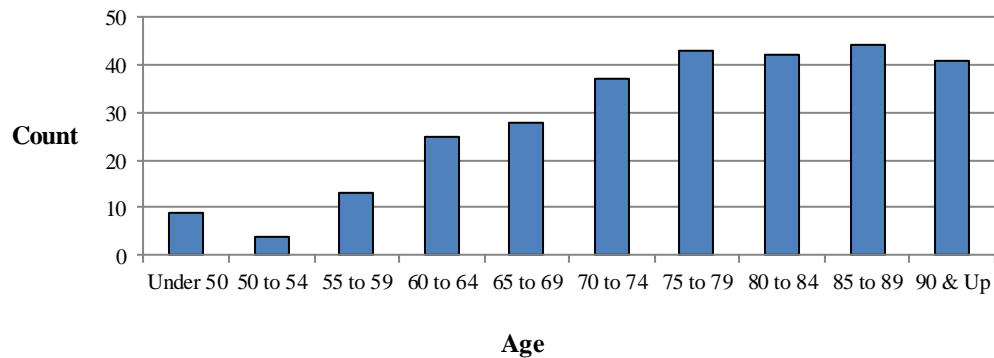
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF BENEFICIARIES
as of December 31, 2017

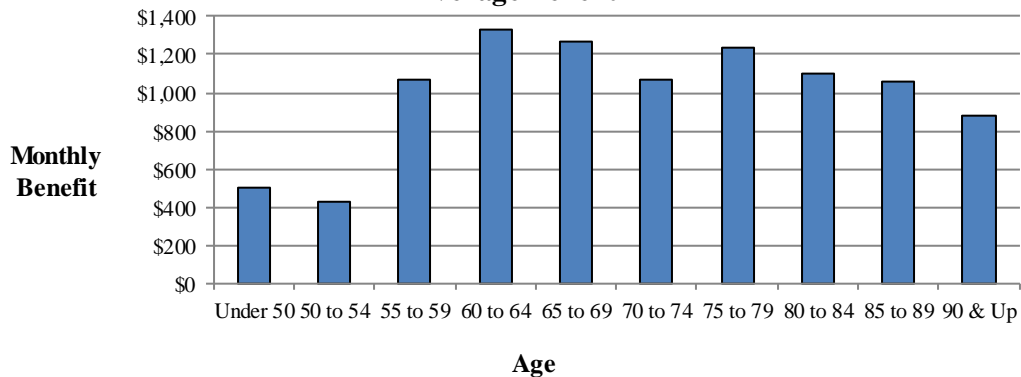
All Plans

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 50	1	8	9	\$ 597	\$ 3,976	\$ 4,573
50 to 54	1	3	4	373	1,337	1,710
55 to 59	3	10	13	3,824	10,022	13,846
60 to 64	1	24	25	1,083	32,040	33,123
65 to 69	6	22	28	6,873	28,472	35,345
70 to 74	6	31	37	4,393	35,094	39,487
75 to 79	6	37	43	3,529	49,716	53,245
80 to 84	4	38	42	3,644	42,355	45,999
85 to 89	9	35	44	5,707	40,625	46,332
90 & Up	5	36	41	2,635	33,540	36,175
Total	42	244	286	\$ 32,658	\$ 277,177	\$ 309,835

Age Distribution



Average Benefit





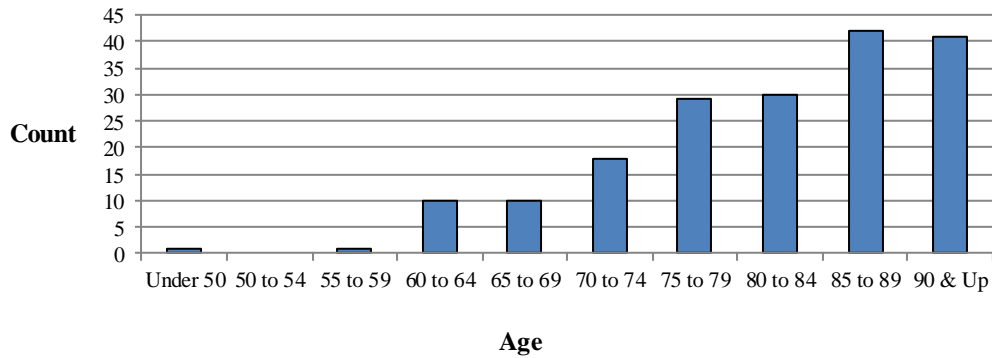
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF BENEFICIARIES
as of December 31, 2017

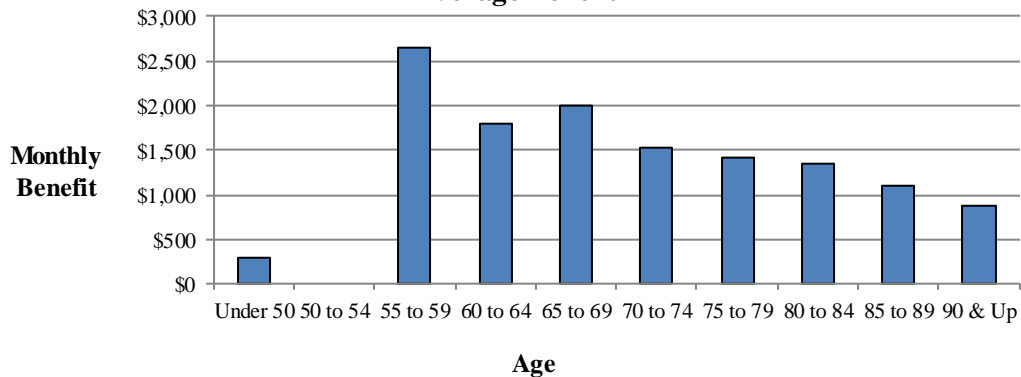
Plan 1

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 50	0	1	1	\$ 0	\$ 292	\$ 292
50 to 54	0	0	0	0	0	0
55 to 59	0	1	1	0	2,640	2,640
60 to 64	0	10	10	0	18,001	18,001
65 to 69	3	7	10	4,242	15,821	20,063
70 to 74	2	16	18	1,588	26,010	27,598
75 to 79	3	26	29	1,585	39,515	41,100
80 to 84	3	27	30	3,280	37,149	40,429
85 to 89	9	33	42	5,707	40,356	46,063
90 & Up	5	36	41	2,635	33,540	36,175
Total	25	157	182	\$ 19,037	\$ 213,324	\$ 232,361

Age Distribution



Average Benefit





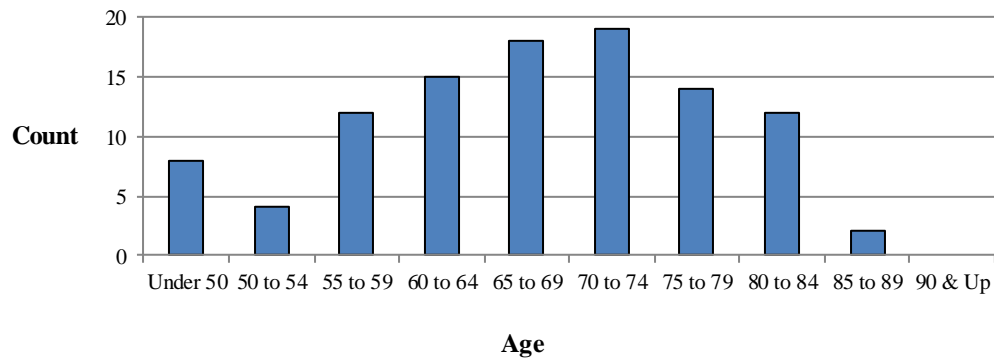
APPENDIX A: SUMMARY OF MEMBERSHIP DATA

SUMMARY OF BENEFICIARIES
as of December 31, 2017

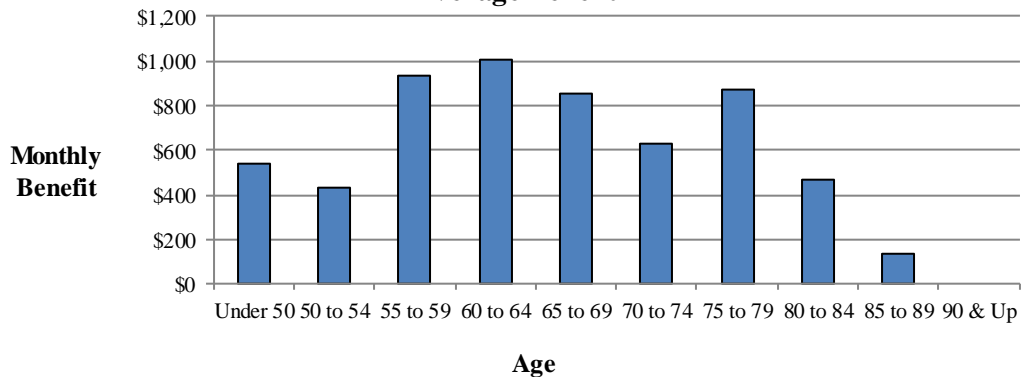
Plan 2

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 50	1	7	8	\$ 597	\$ 3,684	\$ 4,281
50 to 54	1	3	4	373	1,337	1,710
55 to 59	3	9	12	3,824	7,382	11,206
60 to 64	1	14	15	1,083	14,039	15,122
65 to 69	3	15	18	2,631	12,651	15,282
70 to 74	4	15	19	2,805	9,084	11,889
75 to 79	3	11	14	1,944	10,201	12,145
80 to 84	1	11	12	364	5,206	5,570
85 to 89	0	2	2	0	269	269
90 & Up	0	0	0	0	0	0
Total	17	87	104	\$ 13,621	\$ 63,853	\$ 77,474

Age Distribution



Average Benefit





APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Summary of Benefit Provisions

Defined Benefit Plans 1 and 2

Plan 1 is applicable to members employed prior to July 18, 1981 who have not elected to be covered by Plan 2.

Plan 2 is applicable to members employed or re-employed on or after July 18, 1981 and before January 1, 1994 and to other employees who have elected Plan 2 coverage.

Plan 3 is applicable to members employed on or after January 1, 1994 who have not become covered by Plan 2. Plan 3 members are automatically transferred to Plan 2 after they have 7 years of service unless they file an irrevocable election to remain in Plan 3.

NORMAL RETIREMENT (NO REDUCTION FACTOR)

Eligibility – Plan 1: Age 60 with 7 or more years of service, or any age with 30 or more years of service.

Eligibility – Plan 2: Age 62 with 7 or more years of service (effective August 1, 1990).

Amount of Pension – Plan 1: Service times 2.5% of Final Average Salary to a maximum of 75% of Final Average Salary.

Amount of Pension – Plan 2: Service times 2.25% of Final Average Salary to a maximum of 75% of Final Average Salary (effective January 1, 2000).

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.

EARLY RETIREMENT (WITH REDUCTION FACTOR)

Eligibility – all plans: Age 55 with 7 or more years of service.

Amount of Pension – Plan 1: Computed as for normal retirement, but reduced for each month retirement precedes age 60. The reduction is 0.05 of 1% if service is 29 years but less than 30 years, increasing by 0.05 of 1% for each additional year of service less than 30 years, to a maximum of 0.50 of 1% if service is less than 21 years.

Amount of Pension – Plan 2: Computed as for normal retirement, but reduced for each month retirement precedes age 62. The reduction is 0.6% per month for every year of age less than 62 with a maximum reduction of 50.4% at age 55.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

DEFERRED RETIREMENT (VESTED TERMINATION)

Eligibility – all plans: 7 or more years of service. A terminated employee may apply for a reduced pension upon meeting the applicable age requirement for early retirement or an unreduced pension upon meeting the applicable age requirement for normal retirement. A terminated employee may elect a refund of employee contributions, plus applicable interest, in lieu of a deferred retirement benefit.

Amount of Pension – all plans: An amount computed as for normal retirement. Vested deferred pensions are adjusted during the deferral period based on changes in National Average Earnings, up to 5.5% annual adjustments.

DEFERRED RETIREMENT OPTION PLAN (DROP)

Eligibility – all plans: Member must be eligible to retire under early reduced or normal age and/or service requirements and elect to participate in DROP for up to 5 years.

Amount of Benefit – all plans: Benefit computed based on years of service, Final Average Salary as of the DROP election date, and length of DROP period. Benefit is paid into member's notional DROP account during the deferral period. Member and City continue to make required employee and employer contributions during the deferral period. Interest at an annual rate of 5%, compounded monthly, is credited to the notional DROP account. Voluntary termination of employment during the DROP period results in loss of accrued interest. Balance of DROP account is payable within 90 days of actual termination of employment.

SERVICE-CONNECTED DISABILITY

Eligibility – all plans: No age or service requirement. Requires total and permanent disability, as defined in State worker's compensation act, for employment by the City in a position commensurate with the employee's training, experience and education.

Amount of Pension – Plan 1: 60% of final rate of Salary.

Amount of Pension – Plan 2: 50% of final rate of Salary.

NON-SERVICE DISABILITY

Eligibility – all plans: 7 or more years of service. Requires total and permanent disability for employment by the City in a position commensurate with the employee's training, experience and education.

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

Amount of Pension – Plan 2: 25% of final rate of Salary.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

POST-RETIREMENT SURVIVOR BENEFITS

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.

Eligibility – all plans Minor Children: Must be less than 18 years old.

Amount of Pension – all plans Surviving Spouse: 50% of amount that was being paid to retiree.

Amount of Pension – all plans Minor Child with Surviving Spouse: 10% of the member's Final Average Salary for each child under age 18. Maximum, including surviving spouse benefit, is 75% of Final Average Salary.

Amount of Pension – all plans Minor Child without Surviving Spouse: 20% of the member's Final Average Salary for each child under age 18. Maximum benefit is 60% of Final Average Salary.

If no survivor benefits are payable, any accumulated employee contributions with interest in excess of benefit payments made is refunded to the member's beneficiary or estate.

POST-RETIREMENT FUNERAL BENEFITS

Eligibility – Designated Beneficiary: Must have been designated by the retired employee.

Amount of Benefit – Plan 1: \$1,500

Amount of Benefit – Plan 2: None

PRE-RETIREMENT SURVIVOR BENEFITS

Eligibility – Surviving Spouse: Death of employee with 7 or more years of service.

Eligibility – Designated Beneficiary: The beneficiary designated by an unmarried member or by a member who fails to meet the 7 year service requirement for the surviving spouse benefit.

Amount of Pension – Surviving Spouse: 50% of amount that that the deceased employee would have been entitled to had he/she been on an unreduced retirement at time of death.

Amount of Pension – Designated Beneficiary: The deceased employee's contributions, plus applicable interest, plus one month's Salary for each full year of service up to a maximum benefit of 6 months of Salary.

OTHER TERMINATION BENEFITS

Eligibility – all plans: Termination of employment without eligibility for any other benefit.

Amount of Benefit – all plans: Accumulated employee contributions with interest at 5% per year compounded monthly are refunded.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

POST-RETIREMENT ADJUSTMENTS OF PENSIONS

Eligibility – Plan 1: Completion of 12 months of retirement.

Eligibility – Plan 2: If retired on or after January 1, 2000, completion of 12 months of retirement. If retired before January 1, 2000, there is no adjustment (effective February 19, 2000).

Annual Amount – Plan 1: 3% of the original base amount of benefit (simple COLA).

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

EMPLOYEE CONTRIBUTIONS

Plan 1: 6.4% of total compensation

Plan 2: 4.7% of base salary and longevity pay

Plan 3: 4.7% of base salary and longevity pay

CITY CONTRIBUTIONS

Actuarially determined amount which together with employee contributions and investment earnings will fund the obligations of the System in accordance with accepted actuarial principles.

Plan 3: 4.7% of base salary and longevity pay, less forfeitures from non-vested terminations.

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.

VESTING OF CONTRIBUTIONS

Plan 3: Member contributions and investment earnings thereon are 100% vested. City contributions and investment earnings thereon are 25% vested after 3 years of service, 50% vested after 5 years of service, and 100% vested after 7 years of service.

DISTRIBUTION OF VESTED ACCOUNTS

Plan 3: Vested accounts are payable upon termination of City employment or death. Available forms of payment are prescribed by the Board.

DISABILITY RETIREMENT

Plan 3: Service and non-service connected disability benefits are the same as those of Plan 2. Plan 3 members may alternatively elect to receive a refund of their Plan 3 vested account.



APPENDIX C: ACTUARIAL COST METHOD AND ASSUMPTIONS

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 by active members
- (v) The age patterns of actual retirements



APPENDIX C: ACTUARIAL COST METHOD AND ASSUMPTIONS

In making a valuation, the monetary effect of each assumption is calculated for as long as a present covered person 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 2014. The use of updated assumptions was first effective with the December 31, 2014 valuation.

Investment Rate of Return (net of administrative expenses): This assumption is 7.75% a year, compounded annually and consists of 3.25% long-term price inflation and a 4.50% 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, 1981 valuation, although the allocation between inflation and real return has changed periodically, most recently in 2014.

Salary Increase Rates: These rates are used to project current pay amounts to those upon which a benefit will be based. This table was first used in the December 31, 2014 valuation.

Years of Service	Annual Rate of Salary Increase for Sample Service Durations			
	Inflation Component	Productivity Component	Merit and Longevity	Total
1	3.25%	0.75%	3.20%	7.20%
2	3.25	0.75	3.00	7.00
3	3.25	0.75	2.80	6.80
4	3.25	0.75	2.60	6.60
5	3.25	0.75	2.40	6.40
6	3.25	0.75	2.20	6.20
7	3.25	0.75	2.00	6.00
8	3.25	0.75	1.80	5.80
9	3.25	0.75	1.70	5.70
10	3.25	0.75	1.60	5.60
11	3.25	0.75	1.50	5.50
12	3.25	0.75	1.40	5.40
13	3.25	0.75	1.30	5.30
14	3.25	0.75	1.20	5.20
15	3.25	0.75	1.06	5.06
16	3.25	0.75	0.92	4.92
17	3.25	0.75	0.78	4.78
18	3.25	0.75	0.64	4.64
19	3.25	0.75	0.50	4.50
20	3.25	0.75	0.50	4.50
21	3.25	0.75	0.50	4.50
22	3.25	0.75	0.50	4.50
23	3.25	0.75	0.50	4.50
24	3.25	0.75	0.50	4.50
25	3.25	0.75	0.50	4.50
Over 25	3.25	0.75	0.25	4.25



APPENDIX C: ACTUARIAL COST METHOD AND ASSUMPTIONS

The salary increase assumptions will produce 4.00% 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. The real rate of return over assumed wage growth is 3.75% per year.

Changes actually experienced in average pay and total payroll (excluding DROP participants) have been as follows:

	Year Ended					5 Year (Average) Compounded
	12/31/17	12/31/16	12/31/15	12/31/14	12/31/13	Annual Increase
Average Payroll	2.1%	1.5%	2.1%	1.7%	0.8%	1.6%
Total Payroll	0.2%	3.4%	2.9%	3.0%	(0.2%)	1.8%

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 (ages set forward two years for males, zero for females)

Disabled Retirees: RP-2000 Disabled Table for Males and Females

Active Members: RP-2000 Employee Table (ages set forward two years for males, zero for females)

The RP-2000 Tables are used with generational mortality.

Sample Ages ⁽¹⁾	Present Value of \$1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	\$136.27	\$141.98	30.4	34.6
55	128.67	135.41	25.7	29.7
60	118.41	127.04	21.2	25.1
65	150.86	116.91	16.9	20.7
70	91.20	104.80	13.0	16.7
75	75.12	90.90	9.7	13.0
80	58.98	75.76	6.9	9.8
85	44.42	60.20	4.8	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.



APPENDIX C: ACTUARIAL COST METHOD AND ASSUMPTIONS

Rates of Retirement and Deferred Retirement Option Plan (DROP) Elections: These rates are used to measure the probability of eligible members retiring under either the regular retirement provisions or from the Deferred Retirement Option Plan.

Percent Retiring During Year

Retirement Age	Plan 1	Plan 2
55	15%	3%
56	15	3
57	15	3
58	15	3
59	15	3
60	40	3
61	40	20
62	20	40
63	20	25
64	20	25
65	100	50
66	N/A	35
67	N/A	20
68	N/A	20
69	N/A	20
70	N/A	100

In addition, the following assumptions would apply to members in this category:

Plan 2: 70% of members with 33.33 or more years of service and are at least age 62 will elect the DROP with an average DROP period of 36 months.

All members of the retirement system were assumed to retire on or before age 70.

Deferred vested members are assumed to retire at age 62.

This assumption was first used in the December 31, 2014 actuarial valuation.



APPENDIX C: ACTUARIAL COST METHOD AND ASSUMPTIONS

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	Probability of Terminating During Year
0	13.00%
1	13.00
2	11.00
3	9.00
4	8.00
5	7.00
6	6.00
7	5.00
8-12	4.50
13	4.00
14	3.50
15	3.00
16	2.75
17	2.50
18	2.50
19	2.25
20 or more	2.00

These rates were first used for the December 31, 2014 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
Under 15	60%
15-19	40
20-24	20
25 or more	0

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

Rates of Disability: There is no disability assumption. This assumption was first eliminated in the December 31, 2014 valuation.

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 4.0% per year, compounded annually. This assumption was first used for the December 31, 2009 valuation.



APPENDIX C: ACTUARIAL COST METHOD AND ASSUMPTIONS

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Marriage Assumption: 70% 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.

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 turnover decrement does not operate during retirement eligibility.

Miscellaneous Loading Factors: The calculated normal retirement benefits are increased by 2.5% to account for the inclusion of unused sick leave in the calculation of Service. This assumption was changed with the December 31, 2014 valuation.

Plan 3 Transfer Assumption: For purposes of the valuation, Plan 3 members are assumed to transfer to Plan 2 if they acquire 7 years of service.



APPENDIX D: GLOSSARY OF TERMS

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 single 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	<p>The difference between actuarial liability and the valuation assets.</p> <p>Most retirement systems have unfunded actuarial liability. They arise each time new benefits are added and each time an actuarial loss is realized.</p> <p>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.</p>