

City of Kalamazoo
Employees Retirement System
Sixty-Seventh Annual Actuarial Valuation
December 31, 2018



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May 3, 2019

Retirement Investment Committee
Board of Trustees
City of Kalamazoo Employees Retirement System
Kalamazoo, Michigan

**Re: City of Kalamazoo Employees Retirement System Annual Actuarial Valuation
as of December 31, 2018 Actuarial Disclosures**

Ladies and Gentlemen:

The results of the December 31, 2018 Annual Actuarial Valuation of the City of Kalamazoo Employees Retirement System are presented in this report.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are to measure the System's funding progress and to determine the employer contribution rate for the fiscal year ending December 31, 2018. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section D of this report. This report includes risk metrics starting on page A-3, but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

The findings in this report are based on data and other information through December 31, 2018. The valuation was based upon information furnished by the City, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the City.

This report was prepared using assumptions adopted by the Board. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. Additional information about the actuarial assumptions is included in the section of this report entitled Actuarial Cost Methods and Assumptions.

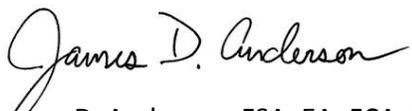
This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the City of Kalamazoo Employees Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

James D. Anderson and Michael D. Kosciuk are Members of the American Academy of Actuaries (MAAA) and meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation and report with the Board and to answer any questions pertaining to the valuation.

Respectfully submitted,



James D. Anderson, FSA, EA, FCA, MAAA



Michael D. Kosciuk, ASA, EA, ACA, MAAA

JDA/MDK:dj

SECTION A

EXECUTIVE SUMMARY

Executive Summary

Computed Employer Contributions - Fiscal Year Beginning January 1, 2019.

As expected, based on last year's results, City contributions will not be required for year beginning 2019.

The pensions provided by the City to its employees through the Retirement System are valuable financial benefits. Every year that City employees earn another year of credit toward their pensions, there is a cost associated with that credit. The cost of benefits accruing during the year, known as the normal cost, totals \$6.7 million for fiscal year beginning January 1, 2019. Refer to page B-2 for additional information. The reason that City contributions are not currently needed to support the Retirement System is that favorable experience over decades, and member contributions, have resulted in assets in excess of the accrued liability as of the valuation date. This overfunded liability is currently supporting the pension costs that would otherwise require City contributions. As employees accrue larger pensions by earning additional service each year, the cost of those larger pensions may use up the overfunded liability.

2018 Funding Position

This year valuation assets represent 134.7% of accrued liabilities; last year the ratio was 136.8%. The decrease in funding position is primarily the result of experience losses outlined on page A-2.

Contribution Requirements Longer Term

The System continues to have an overfunding credit and application of the credit brings the required Employer contribution amount to \$0. Contributions are based on a smoothed (actuarial) value of assets that recognize a given year's asset gain or loss over the current and subsequent four years. Looking forward from December 31, 2018, scheduled recognition of prior gains will help strengthen the overfunding credit. Future investment gains could offer additional support to the overfunding. Conversely, future investment losses would reduce the credit. Any significant losses will hasten the emergence of a City contribution requirement.

We understand that certain groups have an employee contribution rate tied to the funded status of the plan. For example, if the plan is less than 120% funded, additional employee contributions are required. The funded percent as of December 31, 2018 is 134.7%. Please note that it is possible that the funded percent could fall below 120% at the next valuation as of December 31, 2019.

Executive Summary (Continued)

Reasons for Changes

There are three general reasons why contribution requirements change from one valuation to the next. The first is a change in the benefits or eligibility conditions of the System. The second is a change in the valuation assumptions used to predict future occurrences and the methods used to finance the benefits. The third is the difference during the year between the System's actual experience and what the assumptions predicted, or the plan experience.

Changes in Plan Provisions

The following changes in plan provisions were reflected in this valuation:

- The vesting requirement for General Exempt members hired on or after September 1, 2010 was changed from 10 years to 5 years;
- The vesting requirement for AFSCME hired on or after October 2, 2016 was changed from 9 years to 10 years;
- The City Manager is eligible for a 2.7% benefit multiplier and a 2.0% post-retirement adjustment if date of retirement is on or after September 1, 2023; and
- The creation of a Deferred Retirement Option Plan (DROP) for eligible public safety administrators.

Changes in Cost Methods and Actuarial Assumptions

There have been no changes in Cost Methods or Actuarial Assumptions since the 2017 valuation.

An experience study is scheduled for completion before the December 31, 2019 valuation, with expected changes to mortality and other assumptions.

2018 Plan Experience

There was an experience loss of \$(11,950,809) during 2018, primarily due to unfavorable asset experience. This represents 2.59% of the 2017 accrued liabilities. The effect of this loss is a decrease in the overfunding credit.

Causes of the Loss

The market value of assets returned (7.23%) in 2018 and the return on the (smoothed) valuation assets was 6.08%. Net investment income on the smoothed basis was less than the long-term assumption of 7.50%, resulting in a loss of \$8,731,077. The remaining loss of \$3,219,732 represents demographic experience different than assumed (primarily as resulting from pay increases greater than expected).

Investment gain (loss)	\$ (8,731,077)
Remaining gain (loss)	<u>(3,219,732)</u>
Gain (loss) from all causes	\$(11,950,809)

Executive Summary (Continued)

Other Observations

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.5% on the actuarial value of assets for the plan), it is expected that:

- (1) total normal cost amounts as a percentage-of-payroll will remain approximately level year-to-year;
- (2) employer normal cost amount as a percentage-of-payroll will fluctuate as the population make up and funded ratio of the plan changes (employee contributions for certain groups are tied to the plan's funding position);
- (3) the overfunding credit will be used up over a period of years; and
- (4) the funded status of the plan will decrease towards a 100% funded ratio.

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.
- (2) The measurement is inappropriate for assessing the need for or the amount of future employer contributions.

Risk Commentary

Determination of the accrued liability, the employer contribution, and the funded ratio requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability, the actuarially determined contribution and the funded ratio that result from the differences between actual experience and the actuarial assumptions.

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; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Executive Summary (Continued)

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

- **Investment Risk** – actual investment returns may differ from the expected returns;
- **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
- **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
- **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
- **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
- **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution rate shown on page B-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	<u>2018</u>	<u>2017</u>
Ratio of the market value of assets to total payroll	15.9	19.2
Ratio of actuarial accrued liability to payroll	12.7	13.2
Ratio of actives to retirees and beneficiaries	0.6	0.6
Ratio of net cash flow to market value of assets	-4.9%	-4.1%

Executive Summary (Concluded)

RATIO OF MARKET VALUE OF ASSETS TO TOTAL PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 15.0 times the payroll, a return on assets 5% different than assumed would equal 75% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

ADDITIONAL RISK ASSESSMENT

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

Conclusion

For years, the overfunded position enjoyed by the System has generated a funding credit which allowed the City to temporarily reduce (and then temporarily eliminate) annual contributions to the System trust.

SECTION B

VALUATION RESULTS

Computed Contributions to Provide Benefits

The Retirement System is supported by contributions from the City (when required) and active members and by the investment income earned on System assets. Member contribution rates are determined by the benefit provisions of the System and are summarized in Section B of this report. The City provides an actuarially determined contribution, the remainder, if any, needed to meet the financial objective.

Member and City contributions cover both (i) normal cost, and (ii) financing of the unfunded accrued liability over a period of future years. The normal cost is the portion of System costs allocated to the current year by the valuation method described in Section D. The unfunded accrued liability is the portion of System costs not covered by present System assets and future normal costs.

For a plan that is overfunded, contribution income needs to cover the normal cost less an amortization credit on the overfunding. When a plan is extremely overfunded, the amortization credit may completely offset the normal cost, eliminating the need for employer contribution income. This can persist for years as long as investment income is sufficient to maintain the overfunding.

When contributions are once again required, we recommend one of the following procedures for determining City contributions to the Retirement System.

- (1) Contribute dollar amounts for a period which are equal to the City's percent-of-payroll contribution requirements on page B-2 multiplied by the covered active member payroll for the period. Adjustments should be made as necessary to exclude items of pay that are not covered compensation for Retirement System benefits and to include non-payroll payments that are covered compensation.
- (2) Contribute the dollar amounts on page B-2.

Computed Contributions to Provide Benefits Expressed as Percents and Dollars of Active Member Payroll

Contributions for the Year Beginning January 1,	2019	2018
Normal cost of benefits		
Age & service	15.52 %	15.27 %
Disability	1.26	1.26
Pre-retirement survivor	0.39	0.38
Refunds of member contributions	0.19	0.21
Total normal cost	17.36	17.12
Administrative expense allowance	0.65	0.65
Less: Member contributions*	3.21	3.14
Employer normal cost	14.80	14.63
Unfunded actuarial accrued liabilities^	(51.93)	(57.23)
Employer Contribution Requirement@	(37.13)	(42.60)

Contributions for the Year Beginning January 1,	2019	2018
Normal cost of benefits		
Age & service	\$ 6,011,688	\$ 5,531,485
Disability	488,062	456,429
Pre-retirement survivor	151,067	137,653
Refunds of member contributions	73,597	76,072
Total normal cost	6,724,414	6,201,639
Administrative expense allowance	251,778	235,459
Less: Member contributions*	1,243,397	1,137,450
Employer normal cost	5,732,795	5,299,648
Unfunded actuarial accrued liabilities^	(20,115,138)	(20,731,297)
Employer Contribution Requirement@	\$ (14,382,343)	\$ (15,431,649)
Valuation Payroll	\$ 37,425,219	\$ 34,999,543
Recommended Employer Contribution	\$ 0	\$ 0

* Weighted average of various contribution rates.

@ As the System cannot contribute back to the employer, no employer contribution is required. Payroll used to develop the Employer Contribution Requirement is adjusted for pay increases assumed to occur between the valuation date and the fiscal year of contribution.

^ Page B-4 displays the unfunded accrued liabilities (or overfunding) that are amortized by the contribution rates shown above.

History of City's Contribution Rates

Fiscal Year	Valuation Date Dec. 31	Contribution as Percent of		
		Valuation	Payroll	Recommended Actual
2000	*@	1999	0.00 %	\$ 0 \$ 0
2001	*	2000	0.00	0 0
2002	*	2001	0.00	0 0
2003	*@	2002	0.00	0 0
2004	*	2003	0.00	0 0
2005	@	2004	0.00	0 0
2006	*@	2005	0.00	0 0
2007	*	2006	0.00	0 0
2008	*	2007	0.00	0 0
2009	*	2008	0.00	0 0
2010	*@	2009	0.00	0 0
2011	*@	2010	0.00	0 0
2012	*	2011	0.00	0 0
2013	*#	2012	0.00	0 1,811,492
2014	@#	2013	0.00	0 760,912
2015	#	2014	0.00	0 1,602,053
2016		2015	0.00	0 0
2017	&	2016	0.00	0 0
2018		2017	0.00	0 0
2019	*	2018	0.00	0 !

* Retirement System amended.

@ Revised actuarial assumptions and/or methods.

Actual Employer contributions were to cover the cost of lump sum payments in relation to the Early Retirement Initiative.

! Not yet available.

& After spin-off of certain members and plan assets to the CCTA Pension Plan.

Unfunded Accrued Liability

	Year Ending December 31,	
	2018	2017
A. Accrued Liability		
1. For Retirees and Beneficiaries	\$349,992,899	\$346,085,750
2. For Vested Terminated Members	6,715,558	5,120,256
3. For Present Active Members		
a. Value of expected future benefit payments	171,766,358	159,860,494
b. Value of future normal costs	53,762,438	49,769,358
c. Active member liability: (a) - (b)	118,003,920	110,091,136
4. Total	474,712,377	461,297,142
B. Present Assets		
1. Valuation Basis	639,298,190	630,918,080
2. Market Basis	594,371,413	670,927,960
C. Unfunded Accrued Liability (Excess Assets)		
1. Valuation Basis: (A.4) - (B.1)	(164,585,813)	(169,620,938)
2. Market Basis: (A.4) - (B.2)	(119,659,036)	(209,630,818)
D. Funded percent		
1. Valuation Basis: (B.1) / (A.4)	134.7%	136.8%
2. Market Basis: (B.2) / (A.4)	125.2%	145.4%

Schedule of Funding Progress

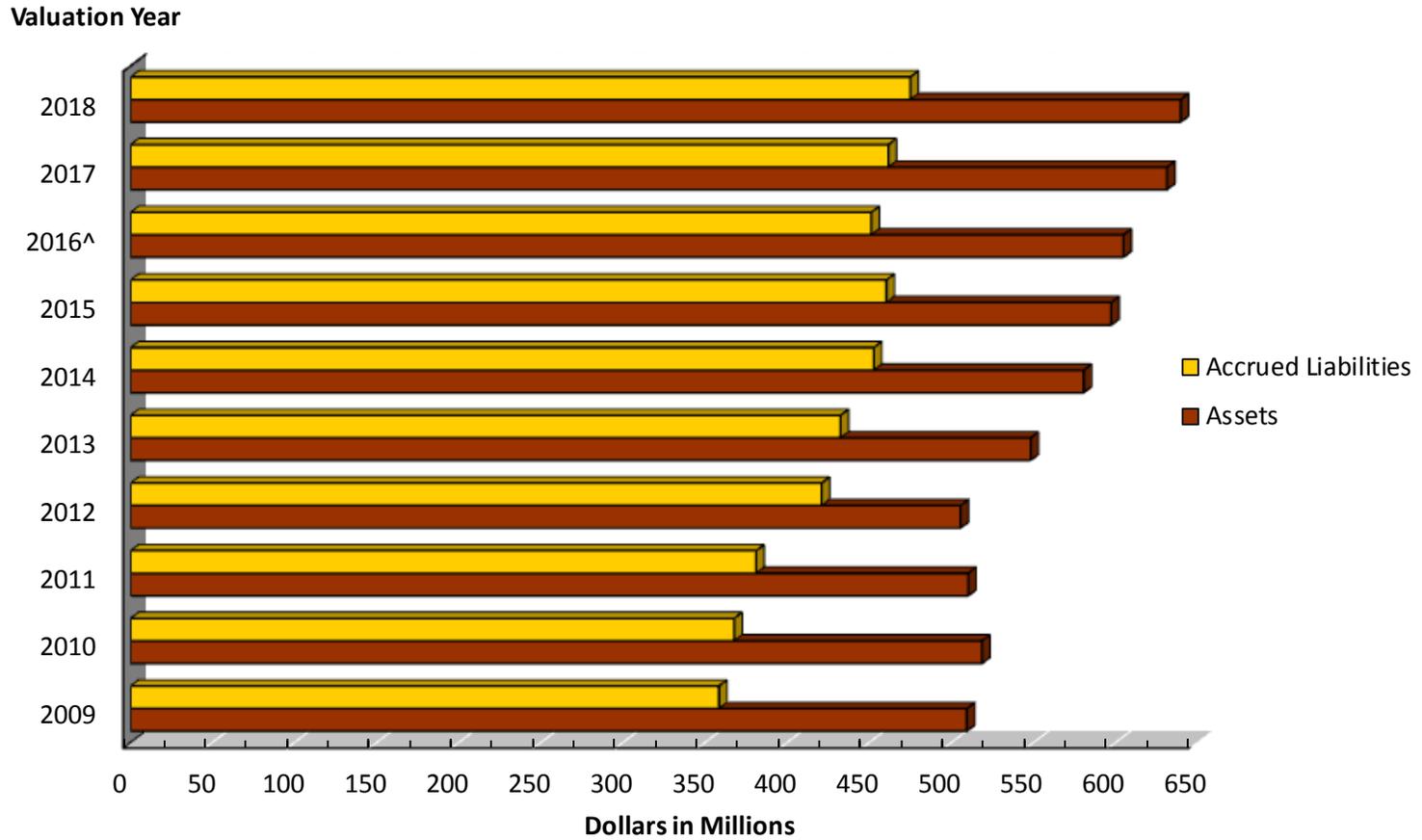
Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry-Age (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c)
12/31/09 @	\$509,060,409	\$358,160,400	\$ (150,900,009)	142.1%	\$44,435,753	(339.6)%
12/31/10 @	518,339,022	367,423,552	(150,915,470)	141.1	43,007,800	(350.9)
12/31/11 @	509,931,421	380,802,126	(129,129,295)	133.9	42,305,663	(305.2)
12/31/12	505,234,953	420,711,365	(84,523,588)	120.1	36,538,969	(231.3)
12/31/13	547,923,629	432,148,526	(115,775,103)	126.8	36,331,892	(318.7)
12/31/14 #	580,220,033	452,381,149	(127,838,884)	128.3	37,198,788	(343.7)
12/31/15	596,998,070	460,133,623	(136,864,447)	129.7	37,291,474	(367.0)
12/31/16 #&	604,411,432	450,930,640	(153,480,792)	134.0	32,780,965	(468.2)
12/31/17	630,918,080	461,297,142	(169,620,938)	136.8	34,999,543	(484.6)
12/31/18 @	639,298,190	474,712,377	(164,585,813)	134.7	37,425,219	(439.8)

@ Plan amended.

Certain assumptions revised.

& After spin-off of certain members and plan assets to the CCTA Pension Plan.

Assets and Accrued Liabilities



2009 assets equaled 142.1% of accrued liabilities.
 2018 assets equaled 134.7% of accrued liabilities.

^ After spin-off of certain members and plan assets to the CCTA Pension Plan.

Development of Experience Gain/(Loss) Year Ended December 31, 2018

Actual experience will never (except by coincidence) exactly match assumed experience. It is hoped that gains and losses will cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the development of the experience gain/(loss) is shown below:

	Year Ending December 31,	
	2018	2017
(1) UAAL* at start of year	\$(169,620,938)	\$(153,480,792)
(2) Normal cost from prior year	6,650,461	6,331,417
(3) Actual contributions	1,209,623	1,086,257
(4) Interest accruals on (1), (2), and (3)	(12,519,998)	(11,316,737)
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	(176,700,098)	(159,552,369)
(6) Change from benefit increases	163,476	0
(7) Change from revised actuarial assumptions and/or methods	0	0
(8) Expected UAAL after changes: (5) + (6) + (7)	(176,536,622)	(159,552,369)
(9) Actual UAAL at end of year	(164,585,813)	(169,620,938)
(10) Gain/(loss): (8) - (9)	(11,950,809)	10,068,569
(11) Gain/(loss) as percent of actuarial accrued liabilities at start of year	(2.59%)	2.23%

* *Unfunded Actuarial Accrued Liabilities.*

2018 Gain/(Loss)		
Totals	Investment	Non-Investment
\$(11,950,809)	\$(8,731,077)	\$(3,219,732)

Development of Valuation Assets

Year Ended December 31:	2016*	2017	2018	2019	2020	2021	2022
A. Valuation Assets Beginning of Year	\$596,998,070	\$604,411,432	\$630,918,080				
B. Market Value End of Year	634,741,566	670,927,960	594,371,413				
C. Market Value Beginning of Year	589,527,061	604,411,432	670,927,960				
D. Non-Investment Net Cash Flow	(27,725,487)	(27,784,751)	(29,115,826)				
E. Investment Income							
E1. Market Total: B - C - D	72,939,992	94,301,279	(47,440,721)				
E2. Amount for Immediate Recognition (7.5%)	43,735,149	44,288,929	46,227,013				
E3. Amount for Phased-In Recognition: E1-E2	29,204,843	50,012,350	(93,667,734)				
F. Phased-In Recognition of Investment Income							
F1. Current Year: 0.2 x E3	5,840,969	10,002,470	(18,733,547)				
F2. First Prior Year	(10,503,425)	0	10,002,470	\$ (18,733,547)			
F3. Second Prior Year	190,784	0	0	10,002,470	\$ (18,733,547)		
F4. Third Prior Year	13,562,349	0	0	0	10,002,470	\$ (18,733,547)	
F5. Fourth Prior Year	6,845,641	0	0	0	0	10,002,470	\$ (18,733,546)
F6. Mark to Market	5,797,516	0	0	0	0	0	0
F7. Total Phased-In Recognition	21,733,834	10,002,470	(8,731,077)	(8,731,077)	(8,731,077)	(8,731,077)	(18,733,546)
G. Valuation Assets End of Year: A + D + E2 + F7	634,741,566	630,918,080	639,298,190				
H. Difference between Market & Valuation Assets: B - G	0	40,009,880	(44,926,777)	(36,195,700)	(27,464,623)	(18,733,546)	0
I. Valuation Asset Recognized Rate of Return	11.23%	9.19%	6.08%				
J. Market Value Recognized Rate of Return	12.67%	15.97%	(7.23)%				

* Represents combined City and CCTA assets, prior to CCTA spin-off.

The Valuation Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased-in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, Valuation Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Valuation Assets will tend to be greater than Market Value. The Valuation Assets are unbiased with respect to Market Value. At any time, it may be either greater or less than Market Value. If assumed rates are exactly realized for 4 consecutive years, it will become equal to Market Value.

Valuation Asset Growth History

Year	Net Contribution Income	Net Investment Return	Benefit Payments and Refunds	Year End Assets*
1999	\$ 1,474,740	\$ 45,017,668	\$ 9,993,770	\$ 303,699,411
2000	1,302,970	36,510,420	10,069,664	331,443,137
2001	1,261,691	27,898,652	11,446,161	349,157,319
2002	1,313,297	9,341,851	11,157,971	348,654,496
2003	1,314,089	23,609,527	12,390,484	361,187,628
Five-Year Period	6,666,787	142,378,118	55,058,050	
2004	1,360,815	41,621,866	13,555,032	390,615,277
2005	1,232,973	44,444,158	13,726,647	422,565,761
2006	1,238,628	53,842,184	14,365,610	463,280,963
2007	1,344,408	52,089,141	15,926,268	500,788,244
2008	1,445,963	20,324,800	15,966,434	506,592,573
Five-Year Period	6,622,787	212,322,149	73,539,991	
2009	1,368,975	17,762,035	16,663,174	509,060,409
2010	1,432,395	24,986,635	17,140,417	518,339,022
2011	1,268,330	8,714,595	18,390,526	509,931,421
2012	951,916	19,419,524	25,067,907 &	505,234,954
2013 \$	2,652,485	67,194,702	27,158,512 &	547,923,629
Five-Year Period	7,674,101	138,077,491	104,420,536	
2014 \$	1,595,508	58,503,025	27,802,129 &	580,220,033
2015 \$	2,386,196	42,748,541	28,356,700	596,998,070
2016	771,383	65,468,983	28,496,870	634,741,566
2016	--	--	--	604,411,432 ^
2017	706,628	54,291,399	28,491,379	630,918,080
2018	815,591	37,495,936	29,931,417	639,298,190
Five-Year Period	6,275,306	258,507,884	143,078,495	

* Does not reflect future contributions to purchase service.

& Includes special distributions under the ERI.

\$ Includes an employer contribution of \$1,811,492 in 2013, \$760,912 in 2014, and \$1,602,053 in 2015 to cover the cost of lump sum payments related to the Early Retirement Initiative.

^ After transfer of \$30,330,134 to CCTA.

Valuation Asset Investment Experience History (\$'000 omitted)

Year	Assumed Net Investment Income		Net Dividends and Interest		Recognized Gains\ (Losses) *		Net Investment Income		Experience Gain\ (Loss)
	Amount	%	Amount	%	Amount	%	Amount	%	
1999	\$ 19,721	7.50 %	\$7,844	2.98 %	\$ 37,173	14.14 %	\$ 45,018	17.12 %	\$ 25,297
2000	22,449	7.50	8,675	2.90	27,836	9.30	36,510	12.20	14,062
2001	24,477	7.50	5,705	1.75	22,171	6.79	27,876	8.54	3,398
2002	25,818	7.50	5,113	1.49	4,229	1.21	9,342	2.70	(16,476)
2003	25,734	7.50	5,790	1.69	17,819	5.21	23,610	6.90	(2,124)
2004	26,632	7.50	7,356	2.07	34,266	9.65	41,622	11.72	14,989
2005	28,828	7.50	15,466	4.02	28,978	7.54	44,444	11.56	15,617
2006	31,200	7.50	21,321	5.13	32,521	7.82	53,842	12.94	22,642
2007	34,199	7.50	24,659	5.41	27,430	6.02	52,089	11.42	17,890
2008	37,015	7.50	14,940	3.03	5,385	1.09	20,325	4.12	(16,690)
2009	37,421	7.50	7,655	1.53	10,107	2.03	17,762	3.56	(19,659)
2010	37,590	7.50	9,773	1.95	15,214	3.04	24,987	4.99	(12,604)
2011	38,233	7.50	9,511	1.87	(796)	(0.16)	8,715	1.71	(29,519)
2012	37,341	7.50	14,063	2.82	5,357	1.08	19,420	3.90	(17,921)
2013	36,974	7.50	13,899	2.82	53,296	10.81	67,195	13.63	30,221
2014	40,112	7.50	13,406	2.51	45,097	8.43	58,503	10.94	18,392
2015	42,543	7.50	14,413	2.54	28,336	5.00	42,749	7.54	206
2016 [^]	43,735	7.50	14,868	2.55	50,601	8.68	65,469	11.23	21,734
2017	44,289	7.50	17,533	2.97	36,758	6.22	54,291	9.19	10,002
2018	46,227	7.50	16,785	2.72	20,711	3.36	37,496	6.08	(8,731)

* In addition to net interest and dividends.

[^] Experience includes impact of Mark-to-Market.

Development of Valuation Investment Gain/(Loss) Year Ended December 31, 2018

The December 31, 2017 valuation assumed an average net return on valuation assets for future years. Net investment return in excess of represents a gain. If net investment return falls short of 7.5%, the difference between an income of 7.5% and the net return represents a loss. For the year ended December 31, 2018, the valuation anticipated investment return of \$46,227,013 (see item E2 on page B-8). Total phased-in recognition amounted to a loss of \$(8,731,077) for the year (see item F7 on page B-8), resulting in a return of 6.08% on a valuation basis (see item I on page B-8).

Please note that this analysis uses asset values and investment income as defined for the actuarial valuation (dollar weighted). It is not, therefore, appropriate as a measure of manager performance.

Rates of Return and Change in Pays and Liabilities

	Year Ended December 31,					5-Year Average*
	2018	2017	2016	2015	2014	
Increase in average salary#	8.7%	3.7%	3.6%	0.7%	2.3%	3.8%
Return on assets^	6.1	9.2	11.2	7.5	10.9	9.0
Liability growth !	2.9	0.0	3.1	1.7	1.9	1.9

* *Compound rate of increase.*

For members employed throughout the most recent two years.

^ *The nominal rate of return was computed using the approximate formula $i = I$ divided by $1/2 (A + B - I)$, where I is actual investment income net of expenses, A is the beginning of year asset value, and B is the end of year asset value.*

! *The liability growth for the year ended December 31, 2014 is before reflecting a change to the assumptions and methods resulting from an experience review dated February 19, 2015. The liability growth for the year ended December 31, 2016 is net of the CCTA transfer liability.*

SECTION C

SUMMARY OF THE INFORMATION SUBMITTED FOR THE VALUATION

Brief Summary of Benefit Provisions*

as Reported for December 31, 2018 Valuation

Eligibility	Amount
REGULAR RETIREMENT (no reduction factor for age)	
<p>General: Age 57 with 25 years of service, or age 62 with 10 years of service. AFSCME members only may also retire at age 60 with 20 years of service. Exempt members only may also retire at age 62 with 5 years of service.</p>	<p>Total service multiplied by:</p> <ul style="list-style-type: none"> 2.1% of FAC – KMEA – effective 1/1/08 2.1% of FAC – AFSCME – effective 10/2/07 2.3% of FAC – Exempt members 2.7% of FAC – City Manager (2.3% if retires before 9/1/2023) 2.1% of FAC – Other General members–CSO – effective 1/1/08 2.7% of FAC – Public Safety members <p>FAC (Final Average Compensation) – Highest 3 consecutive years out of the last 10.</p>
<p>Public Safety: 25 years of service or age 50 with 10 years of service.</p>	<p>Maximum benefit for Public Safety members is equal to 70.2% of FAC.</p>
EARLY RETIREMENT (age reduction factor used)	
<p>General: Age 55 with 15 years of service.</p>	<p>Computed as a regular retirement but reduced by 4/10 of 1% for each month and fraction of a month by which retirement precedes age 62 if less than 25 years of service or age 57 if 25 or more years of service.</p>
<p>Public Safety: 20 years of service.</p>	<p>2% of final average compensation multiplied by years of credited service.</p>
DEFERRED RETIREMENT	
<p>10 years of service for most members, 5 years for Exempt, 9 years for AFSCME hired before 10/2/2016, and 8 years for KMEA hired before 1/1/2009. Benefit begins at age 62 for General employees, and at age 50 for Public Safety employees.</p>	<p>General: Computed as a regular or early retirement but based upon service and final average compensation at termination date.</p> <p>Public Safety: Computed as early retirement.</p>
NON-DUTY DEATH-IN-SERVICE	
<p>10 years of service for most members, 5 years for Exempt, 9 years for AFSCME hired before 10/2/2016, and 8 years for KMEA hired before 1/1/2009.</p>	<p>General: Computed as a regular retirement but actuarially reduced in accordance with a 100% joint and survivor election.</p> <p>Public Safety: A benefit of 33-1/3% of final compensation is paid to the surviving spouse. Unmarried children under 18 years of age receive equal shares of 25% of final compensation.</p>
DUTY DEATH-IN-SERVICE	
<p>Payable to the survivors of a member who died in the line of duty.</p>	<p>A benefit of 33-1/3% of final compensation is paid to the surviving spouse. Unmarried children under 18 years of age receive equal shares of 25% of final compensation. Worker's compensation payments are offset.</p>

* This represents a brief summary of Plan provisions. As always official Plan documents, including the Ordinance and any applicable Collective Bargaining Agreements, will ultimately govern the benefits payable from the Plan.

Brief Summary of Benefit Provisions*

as Reported for December 31, 2018 Valuation (Continued)

Eligibility	Amount
NON-DUTY DISABILITY	
10 years of service for most members, 5 years for General Exempt, 9 years for AFSCME hired before 10/2/2016, and 8 years for KMEA hired before 1/1/2009.	Computed as regular retirement. Reduced on a dollar-for-dollar basis by amount of worker's compensation, if any.
DUTY DISABILITY	
No age or service requirements.	<p>General: Computed as regular retirement with additional service credit granted from day of actual retirement to date of voluntary retirement eligibility.</p> <p>Public Safety: Computed as regular retirement. During worker's compensation period benefit cannot exceed the difference between final compensation and worker's compensation.</p>
DEATH AFTER RETIREMENT	
Spouse of Public Safety member retired on or after July 1, 1972.	50% of the regular retirement benefit the deceased retiree was receiving.
POST-RETIREMENT ADJUSTMENTS (Eligibility for PRAs vary by retirement type)	
AFSCME members who retire on or after 10/25/1999.	1% increases compounded annually, beginning one year after retirement; 2% compounded annually beginning at age 75.
KMEA members.	1.5% increases compounded annually, beginning the latter of the Retirees 64 th birthday and one year after retirement; 2% compounded annually beginning at age 75 (effective in 2002).
Public Safety members who retired on and after 1/1/95 with 25 or more years of service and City Manager.	2% increases compounded annually.
Exempt members.	1.5% increases compounded annually one year after retirement for members who elected to contribute by May 2006.
13TH CHECKS	
Retired by 12/31/1999; retired at least 5 years; have attained age 70 prior to June 1 of the year preceding the periodic payment to be made; had at least 25 years of service with the City; ineligible for post-retirement benefit increases; pension less than \$20,000. Continuation of this program is conditional as described in the ordinance.	The periodic payment described herein shall be made in June every third year, commencing 2001; however, no payment shall be made in any year in which the fund's actuary projects (based upon a valuation of the fund as of December 31 of the prior year) the need for City contributions to the fund (for one or more actuarial grouping) within 10 years of the projection nor if the actuary recommends a contribution by the City (for one or more actuarial grouping) for that year. In the event a periodic payment is not made in a year in which it would otherwise occur (because of the actuary's projection or recommendation), then the payment shall be made in the next year in which no such actuarial projection or recommendation is made. In the event that a periodic payment is so delayed, future periodic payments shall be made every third year thereafter (so long as not prohibited by an actuarial projection or recommendation).

* This represents a brief summary of Plan provisions. As always official Plan documents, including the Ordinance and any applicable Collective Bargaining Agreements, will ultimately govern the benefits payable from the Plan.

Brief Summary of Benefit Provisions*

as Reported for December 31, 2018 Valuation (Concluded)

Eligibility

Amount

MEMBER CONTRIBUTIONS

AFSCME members:	1% - effective 10/2/06. If funding % goes below 120%, contribution rate reverts to 2%.
KMEA members:	1% of AC. If City contributions become necessary, contribution rate increases up to a maximum of 2%.
Exempt members:	1.5% of AC, 3% of AC for Exempt Members hired after 6/1/2006, 3.5% for Exempt Members who signed up for the PRA by May of 2006.
Non-Sworn Public Safety members:	1% of AC.
Sworn Public Safety members:	4.5% of AC. If funding % goes below 120% contribution rate reverts to 6.5%.

CITY CONTRIBUTIONS

Actuarially determined amounts, which, together with member contributions, are sufficient to cover both (i) normal costs of the plan, and (ii) financing of unfunded accrued benefit values over a selected period of future years.

DROP PROGRAM

Effective Date: April 12, 2018

Eligibility: Public safety administrators meeting relevant provisions for an unreduced retirement allowance, authorization by the City Manager, and approval of the City Commission.

Maximum DROP Participation Period: 8 years.

DROP Benefit: Regular monthly benefit frozen at date of DROP election.

DROP Account:

- **Amount credited:** 100% of the DROP Benefit.
- **Interest credit rate:** 2% per annum.

PRA: Election of DROP is the trigger for purposes of determining the date of the first post-retirement increase.

Member Contributions: Cease upon DROP date.

Payout of Vacation/Sick Leave Balance: Not included in the DROP program.

** This represents a brief summary of Plan provisions. As always official Plan documents, including the Ordinance and any applicable Collective Bargaining Agreements, will ultimately govern the benefits payable from the Plan.*

Reported Financial Information Year Ended December 31, 2018 Market Value

Income and Expenses

Revenues:

a. Member contributions	\$ 1,209,623	
b. Employer contributions	0	
c. Interest and dividends	18,988,211	
d. Net Appreciation in Fair Value of Investments	(64,225,595)	
e. Miscellaneous	0	
f. Total		<u>\$(44,027,761)</u>

Expenditures:

a. Benefit payments, including refunds of member contributions	29,931,417	
b. Administrative expenses	394,032	
c. Investment expenses	2,203,337	
Total		<u>32,528,786</u>

Reserve Increase:

Total revenues minus total expenditures		<u><u>(76,556,547)</u></u>
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Reported Financial Information (Valuation Basis)

Year Ended December 31, 2018

Assets on Valuation Basis

Assets:

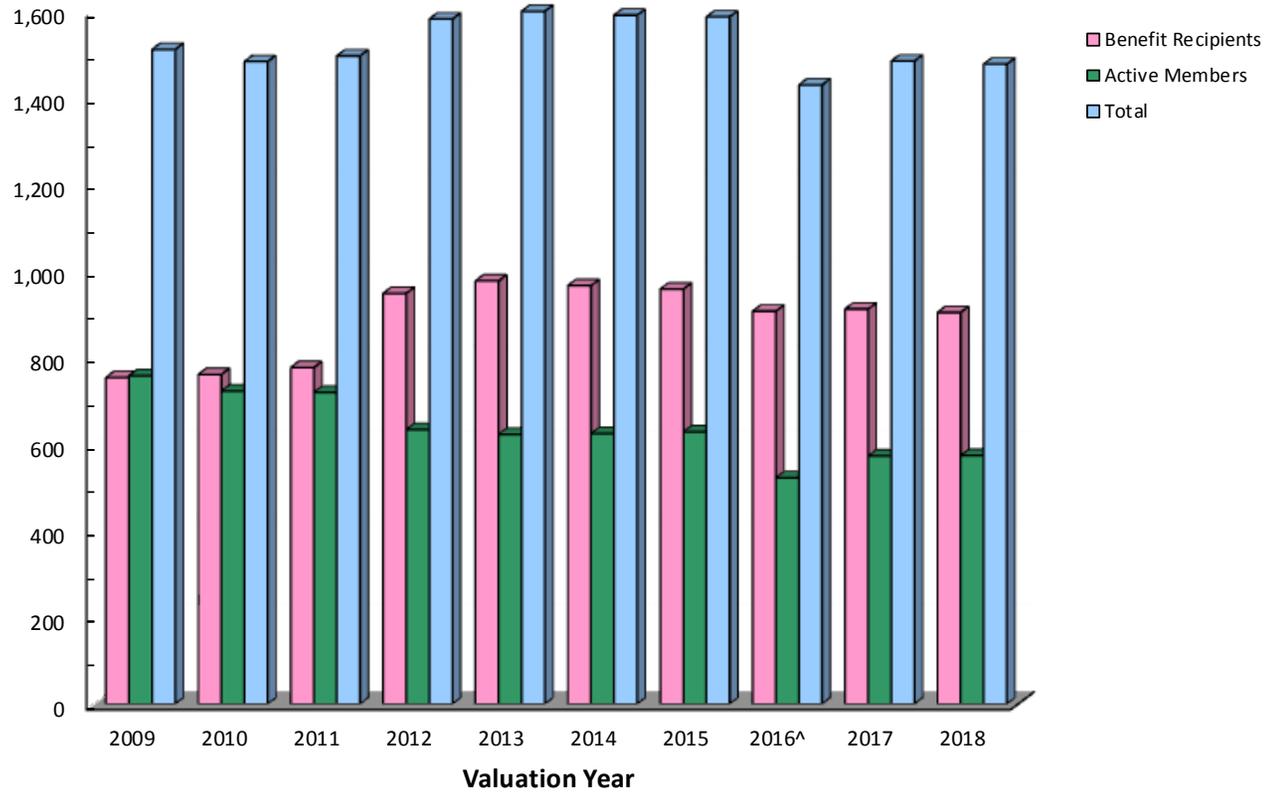
a. Cash or Equivalents	\$ 239,863
b. Receivables Net of Payables	(8,349,020)
c. Stocks	410,847,584
d. Fixed Income	160,122,418
e. Real Estate Investment Fund	31,510,568
f. Funding Value Adjustment	<u>44,926,777</u>
Total	<u>\$639,298,190</u>

Reserve for Retired Benefit Payments

Part of the internal reserve tracking process is to maintain the reserve for retired benefit payments at a level equal to 100% of the value of future benefit payments to retirees and beneficiaries. As of December 31, 2018, the value of future benefit payments to retirees and beneficiaries is \$349,992,899. This valuation assumes any transfer necessary to maintain a 100% funding of the reserve for retired benefit payments has been made as of January 1, 2019.

Active Members & Benefit Recipients

Covered Persons



[^] After spin-off of certain members and plan assets to the CCTA Pension Plan.

Retirements During 2018 Tabulated by Annual Amount of Benefit

Annual Amount	Age and Service	Disability	Survivors	Totals
\$12,000 - 13,999	4			4
18,000 - 19,999	1			1
28,000 - 29,999	1			1
30,000 - 31,999	1			1
32,000 - 33,999	1			1
46,000 - 47,999			1	1
56,000 - 57,999	2			2
58,000 - 59,999	2			2
70,000 - 71,999	1			1
72,000 - 73,999	1			1
Totals	14	0	1	15

This exhibit does not include new alternate payees due to EDRO or new beneficiaries from retirees.

Retirements During 2018 Tabulated by Age Nearest Birthday and Type of Retirement

Ages	Age and Service		Disability		Survivors		Totals	
	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances
48	1	\$ 59,952					1	\$ 59,952
49	1	56,550					1	56,550
50	2	84,461					2	84,461
51	2	128,361			1	\$ 46,028	3	174,389
52	1	13,794					1	13,794
58	1	30,252					1	30,252
60	1	18,761					1	18,761
61	2	45,203					2	45,203
62	3	100,339					3	100,339
Totals	14	\$ 537,673	0	\$ -	1	\$ 46,028	15	\$ 583,701

This exhibit does not include new alternate payees due to EDRO or new beneficiaries from retirees.

Retirees and Beneficiaries as of December 31, 2018 Tabulated by Nearest Age and Type of Retirement*

Attained Age	Age and Service		Disability		Survivors		Totals	
	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances
0 - 39			3	\$ 146,542	2	\$ 30,715	5	\$ 177,257
40 - 44								
45 - 49	9	\$ 462,675	3	172,084			12	634,759
50 - 54	61	3,458,011	4	158,720	1	22,429	66	3,639,160
55 - 59	85	3,614,953	13	440,700	2	78,962	100	4,134,615
60 - 64	133	5,504,967	8	231,282	1	1,132	142	5,737,381
65 - 69	159	5,903,783	9	140,786	2	27,666	170	6,072,235
70 - 74	134	4,772,628	5	94,028	3	32,982	142	4,899,638
75 - 79	107	2,556,726	5	37,120	2	18,878	114	2,612,724
80	12	250,282	1	1,922			13	252,204
81	17	342,930	1	1,827	1	12,827	19	357,584
82	18	273,157					18	273,157
83	7	107,540	1	10,705			8	118,245
84	12	174,700					12	174,700
85	11	113,312					11	113,312
86	9	88,947	2	11,014			11	99,961
87	7	109,528	1	7,943			8	117,471
88	9	120,691					9	120,691
89	9	82,491					9	82,491
90 & Over	32	284,867	2	18,731			34	303,598
Totals	831	\$28,222,188	58	\$ 1,473,404	14	\$ 225,591	903	\$29,921,183

* The retired members with service in more than one group are displayed as if each person were receiving two pensions.

Average Age at Retirement: 53.6 Years.

Average Age Now: 68.7 Years.

Retirees and Beneficiaries - December 31, 2018 Tabulated by Years Retired - Nearest Year

Years Retired	Service Retirement	Disability Retirement	Death-in-Service	Beneficiary of Retiree	Totals	Cumulative Percent
45		2			2	0.2%
44		1		1	2	0.4%
43					0	0.4%
42				2	2	0.7%
41		1	1	1	3	1.0%
40				2	2	1.2%
39	3	1		2	6	1.9%
38	1			1	2	2.1%
37	3	1	1	3	8	3.0%
36	7			7	14	4.5%
35	4			7	11	5.8%
34	7			9	16	7.5%
33	6	1		1	8	8.4%
32	8	1		2	11	9.6%
31	6	1		3	10	10.7%
30	13	1	1	4	19	12.8%
29	9			3	12	14.2%
28	12	1			13	15.6%
27	7			3	10	16.7%
26	5	1		2	8	17.6%
25	17	2	1	2	22	20.0%
24	19		1	7	27	23.0%
23	37	2		7	46	28.1%
22	17	1		4	22	30.6%
21	21		1	1	23	33.1%
20	12	1		1	14	34.7%
19	16			4	20	36.9%
18	16	3	1		20	39.1%
17	11	3		1	15	40.8%
16	44	3	2	6	55	46.8%
15	15	1			16	48.6%
14	19	1		1	21	50.9%
13	14	4	1	1	20	53.2%
12	15	3			18	55.1%
11	20	1		2	23	57.7%
10	17	5		1	23	60.2%
9	17	1			18	62.2%
8	27	3	1	3	34	66.0%
7	92	2		2	96	76.6%
6	97			1	98	87.5%
5	31	1			32	91.0%
4	2	2	1		5	91.6%
3	10	1	1		12	92.9%
2	25	2			27	95.9%
1	24	4			28	99.0%
Less than 1	8		1		9	100.0%
Totals	734	58	14	97	903	

Retiree and Beneficiary Comparative Schedule[@]

Year Ended Dec. 31	Added to Rolls#		Removed from Rolls		Rolls End of Year		% Incr. in Annual Allowances	Average Allowances	Discounted Value of Allowances	
	No.	Annual Allowances*	No.	Annual Allowances	No.	Annual Allowances			Totals	Average
1999	31	\$ 800,436	21	\$ 110,375	632	\$ 9,576,818	7.8 %	\$ 15,153	\$ 109,572,407	\$ 173,374
2000	33	791,069	19	149,304	646	10,218,583	6.7	15,818	120,319,918	186,254
2001	24	530,225	18	147,375	652	10,601,433	3.7	16,260	124,502,845	190,955
2002	47	1,227,293	20	191,684	679	11,637,042	9.8	17,139	136,218,282	200,616
2003	40	929,269	24	208,928	695	12,357,383	6.2	17,780	145,275,896	209,030
2004	32	841,492	18	191,402	709	13,007,473	5.3	18,346	153,594,898	216,636
2005	31	1,367,707	25	268,275	715	14,106,905	8.5	19,730	168,715,852	235,966
2006	24	697,001	19	54,017	720	14,749,889	4.6	20,486	175,276,935	243,440
2007	31	863,128	17	134,800	734	15,478,217	4.9	21,087	181,074,645	246,696
2008	35	1,051,335	19	185,258	750	16,344,294	5.6	21,792	188,654,437	251,539
2009	25	1,554,246	22	247,330	753	17,651,210	8.0	23,441	191,338,855	254,102
2010	47	458,377	40	364,571	760	17,745,016	0.5	23,349	202,420,395	266,343
2011	46	1,104,498	30	132,052	776	18,717,462	5.5	24,120	212,102,413	273,328
2012	191	7,069,939	20	139,920	947	25,647,481	37.0	27,083	300,896,407	317,736
2013	51	2,374,598	22	345,230	976	27,676,849	7.9	28,357	325,233,541	333,231
2014	21	623,969	32	466,386	965	27,834,432	0.6	28,844	334,310,975	346,436
2015	15	621,680	23	370,675	957	28,085,437	0.9	29,347	333,147,365	348,116
2016 [^]	35	1,675,602	86	1,548,816	906	28,212,223	0.5	31,139	334,517,262	369,224
2017	34	1,470,169	29	401,633	911	29,280,759	3.8	32,141	346,085,750	379,897
2018	21	1,050,823	29	410,399	903	29,921,183	2.2	33,135	349,992,899	387,589

[@] The retired members with service in more than one group are displayed as if each person were receiving two pensions.

* Includes post-retirement adjustments.

Includes survivors of newly deceased retirees and alternate payees under EDRO.

[^] Includes impact of CCTA spin-off.

Retirees and Beneficiaries December 31, 2018 Tabulated by Type of Allowances Being Paid*

Option Elected	Age & Service	Disability		Death		Totals
		Non-Duty	Duty	Non-Duty	Duty	
Regular	281	4	9			294
Regular - 50% J & S	235		9			244
A-Cash refund	2					2
B-100% J & S	120	5	12			137
C-50% J & S	90	1	4			95
D-10 Year Certain	4					4
E-15 Year Certain	2		2			4
Survivor	97	8	4	11	3	123
Totals	831	18	40	11	3	903

* The retired members with service in more than one group are displayed as if each person were receiving two pensions.

**Terminated Members with a Deferred Vested Benefit
December 31, 2018
Tabulated by Nearest Age and Estimated Allowance**

Attained Age	No.	Deferred Allowances
30	2	\$ 26,316
33	1	27,716
34	1	19,377
35	2	13,982
37	1	39,219
40	1	24,146
41	2	35,606
43	3	44,559
44	1	19,223
45	2	43,096
46	2	19,825
47	5	76,351
48	4	88,527
49	4	66,999
50	1	24,768
51	4	42,003
52	4	37,913
53	1	10,483
54	3	38,465
55	3	35,666
56	4	40,633
57	2	25,139
58	4	68,065
59	3	52,472
60	2	20,319
61	1	36,201
64	2	14,193
71	1	8,420
Totals	66	\$999,682

Active Members as of December 31, 2018 by Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	20							20	\$ 830,318
25-29	43	10						53	2,605,998
30-34	34	36	9					79	5,046,648
35-39	34	25	30	5				94	6,354,299
40-44	18	18	10	15	12			73	5,169,862
45-49	16	6	6	19	39	6		92	6,790,526
50-54	13	7	5	11	19	8	2	65	4,550,881
55-59	8	4	2	10	14	6	6	50	3,239,014
60	1		2	2	1	1		7	397,710
61	2	4		3	1			10	598,127
62	1	3		3	2	2	1	12	749,665
63				1	2	2		5	359,836
64					1		1	2	109,567
65	1		1		1			3	216,752
66	1			2				3	225,261
67	1							1	16,110
69	1							1	16,210
70	1	1						2	95,257
72		1						1	53,178
Totals	195	115	65	71	92	25	10	573	\$37,425,219

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 42.7 years.

Service: 11.0 years.

Annual Pay: \$65,315.

SECTION D

ACTUARIAL COST METHODS AND ASSUMPTIONS

Valuation Methods

In accordance with Subsection 2-252.2c (10) of the Retirement System Ordinance, the actuarial assumptions are recommended to the City Commission by the Retirement Investment Committee (RIC). The actuarial assumptions used for this report were based upon the results of an Experience Study for the City of Kalamazoo Employees Retirement System covering the period January 1, 2009 through December 31, 2013. A report dated February 19, 2015 presented the results of this experience study. Unless otherwise noted, the assumptions were first used with the actuarial valuation date of December 31, 2014. The actuarial assumptions represent estimates of future experience.

The normal cost was computed as follows:

The series of contributions necessary to accumulate the present value at time of retirement of the portion of a member's pension attributable to service likely to be rendered after the valuation date was computed so that each contribution in the series was a constant percentage of the member's year-by-year projected covered compensation. This is the individual entry age normal actuarial cost method.

The accrued liability was computed and financed as follows:

Retirees and Beneficiaries: The discounted value of pensions likely to be paid retirees and beneficiaries was computed using the investment return and mortality assumptions. This amount was financed by applicable accrued assets.

Active and Inactive members: The discounted value of benefits likely to be paid active and inactive members on account of service rendered prior to the valuation date was computed using the assumptions outlined on the following pages. The computed amount was reduced by applicable valuation assets and the remainder (or overfunding) was financed as a level percent-of-payroll over a rolling period of 10 years.

Asset valuation method: Last year's valuation assets are increased by contributions and expected investment income on last year's valuation assets and non-investment net cash flow and reduced by refunds, benefit payments and expenses. To this amount is added the phased-in recognition of investment income. The phased-in recognition is the sum over the five years ending on the valuation date of 20% of the difference between each year's expected return and actual market return.

Actuarial Assumptions Used for the Valuation

Investment Return. The rate of investment return is compounded annually net of investment expenses.

Investment Return	7.50%
Wage Inflation	3.50%
Price Inflation	2.50%
Spread Between Investment Return and Wage Inflation	4.00%
Spread Between Investment Return and Price Inflation	5.00%

These assumptions are used to equate the value of payments due at different points in time. Approximate net rates of investment return, for the purpose of comparisons with assumed rates, are shown below. Actual increases in active member pays are also shown for comparative purposes.

	Year Ended December 31					5-Year Average*
	2018	2017	2016	2015	2014	
Rate of Investment Return [^]	6.1%	9.2%	11.2%	7.5%	10.9%	9.0%
Increase in Average Pay [#]	8.7	3.7	3.6	0.7	2.3	3.8
Real Rate of Return	(2.6)	5.5	7.6	6.8	8.6	5.2

* Compound rate of increase.

For members employed throughout the most recent two years.

[^] The nominal rate of return was computed using the approximate formula $i = I$ divided by $1/2 (A + B - I)$, where I is actual investment income net of expenses, A is the beginning of year asset value, and B is the end of year asset value.

These rates of return should not be used for measurement of an investment advisor's performance or for comparisons with other systems.

Investment Expenses. 0.50% of average valuation assets.

Administrative Expenses. 0.65% of covered member payroll was added to the Normal Cost in anticipation of administrative expenses expected to be paid during the fiscal year.

Actuarial Assumptions Used for the Valuation (Continued)

Pay Projections. These assumptions are used to project current pays to those upon which benefits will be based.

The annual rate of pay increases consists of two parts:

- (i) a long-term rate of pay inflation equal to 3.5%; and
- (ii) merit and longevity increases which vary according to age or length of service. These rates are illustrated below.

Years of Service	KMEA	AFSCME	Exempt	Non-Sworn Public Safety	Public Safety
1	6.0%	8.0%	6.0%	8.0%	12.0%
2	5.0	3.0	6.0	7.0	12.0
3	4.0	3.0	0.5	6.0	5.5
4	2.0	2.0	0.5	4.0	4.5
5	1.0	2.0	0.5	3.0	4.5
6	1.0	1.0	0.3	1.5	4.0
7	1.0	0.0	0.3	1.5	4.0
8	1.0	0.0	0.3	1.5	4.0
9	0.0	0.0	0.3	1.5	1.5
10	0.0	0.0	0.3	1.5	1.3
11	0.0	0.0	0.3	0.5	1.0
12	0.0	0.0	0.3	0.3	1.0
13	0.0	0.0	0.3	0.3	0.5
14	0.0	0.0	0.3	0.3	0.5
thereafter	0.0	0.0	0.3	0.3	0.5

If the number and distribution of active members remain constant, then the total active member payroll is expected to increase 3.5% annually for the base portion of the salary increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities.

Actuarial Assumptions Used for the Valuation (Continued)

The mortality table used was the RP-2000 Mortality Combined Healthy Tables, projected 20 years with U.S. Projection Scale BB.

Ages	Value at Retirement of \$1 Monthly for Life*		Future Life Expectancy (years)	
	Men	Women	Men	Women
50	\$144.67	\$147.85	32.99	35.59
55	137.49	141.58	28.37	30.90
60	128.51	133.44	23.94	26.34
65	117.58	123.33	19.74	21.98
70	104.59	111.45	15.83	17.93
75	89.73	97.95	12.26	14.25
80	73.73	83.02	9.13	10.95

* Values are before post-retirement increases are reflected.

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. Rates for disabled members were set-forward 7 years.

Actuarial Assumptions Used for the Valuation (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

Retirement Ages	KMEA	AFSCME	Exempt	Non-Sworn Public Safety
55	2%	6%	10%	10%
56	2	7	10	10
57	5	10	25	25
58	5	7	25	25
59	7	6	20	20
60	15	30	25	25
61	15	20	30	30
62	50	60	30	30
63	15	25	15	15
64	10	25	15	15
65	100	100	100	100

Years of Service	Public Safety
20	2%
21	4
22	4
23	2
24	2
25	70
26	30
27	45
28	25
29	25
30	100

Retirement probabilities were applied for General members after both attaining age 55 and completing 15 years of service, or age 62 with 10 years of service (5 years for Exempt, 9 years for AFSCME hired before 10/2/2016 and 8 years for KMEA hired before 1/1/2009). AFSCME members are also considered eligible for retirement at age 60 with 20 or more years of service. Retirement probabilities were applied for Public Safety members upon completion of 20 years of service with 100% retirement probability assumed at age 60 with 10 years of service. The assumptions above were first used for the December 31, 2009 valuation.

Actuarial Assumptions Used for the Valuation (Concluded)

Rates of disability were as follows:

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Public Safety AFSCME	KMEA Exempt CSO
20	0.23%	0.04%
25	0.27	0.04
30	0.32	0.04
35	0.40	0.04
40	0.55	0.10
45	0.76	0.13
50	1.45	0.25
55	2.84	0.45
60	0.00	0.71

Rates of separation from active membership were as shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	% of Active Members Separating within Next Year				
		KMEA	AFSCME	All Exempt	Non-Sworn Public Safety	Public Safety
	0	15.0%	15.0%	15.0%	15.0%	6.0%
	1	14.0	14.0	14.0	14.0	4.0
	2	9.0	9.0	9.0	9.0	3.0
	3	8.0	8.0	8.0	8.0	2.5
	4	7.0	7.0	7.0	7.0	2.5
25	5 or Over	7.4	7.4	7.4	7.4	2.2
30		5.8	5.8	5.8	5.8	2.0
35		5.0	5.0	5.0	5.0	1.4
40		4.0	4.0	4.0	4.0	1.1
45		3.3	3.3	3.3	3.3	0.8
50		2.5	2.5	2.5	2.5	0.6
55		2.0	2.0	2.0	2.0	0.4
60		2.0	2.0	2.0	2.0	0.4

The assumptions above were first used for the December 31, 2009 valuation.

Miscellaneous and Technical Assumptions

Active Member Group Size	The number of active members was assumed to remain constant.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing	Was assumed to occur in the middle of the year. This means that the pays reported for the valuation are assumed to be rates of pay on the valuation date.
Decrement Timing	Decrements are assumed to occur at the middle of the fiscal year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service	Exact fractional service is used to determine the amount of benefit payable.
Decrement Relativity	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation	Death-in-service decrement does not operate until member becomes vested. Withdrawal does not operate during retirement eligibility.
Normal Form of Benefit	The assumed normal form of benefit is straight life form. For public safety members, the assumed normal form of benefit is an automatic 50% Joint and Survivor form. 90% of public safety members were assumed to be married for the purposes of this benefit.
Incidence of Contributions	Contributions are assumed to be received continuously throughout the year based upon the computed percent-of-payroll shown in this report, and the actual payroll payable at the time contributions are made. New entrant normal cost contributions are applied to the funding of new entrant benefits.
Actuarial Equivalence Basis for Optional Forms of Payment	7.5% interest with an 85%/15% unisex blend of the RP-2000 Mortality Combined Healthy Tables, projected 20 years with U.S. Projection Scale BB, effective January 1, 2016.

**Post-Retirement Adjustment
Timing**

Post-retirement adjustments (PRAs) were assumed to be paid on January 1 of each year for Public Safety and Exempt retirees (beginning the year immediately following retirement for Public Safety retirees and the second year following retirement for Exempt retirees). PRAs were assumed to be paid on the first of the month immediately following the retiree’s birthday for all other groups.

Active Member Pay Adjustments

New hire pays were annualized. Pays were adjusted for members on Worker’s Compensation or Leave of Absence for part of the valuation year.

Glossary

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.” Under the actuarial cost method used the “AAL” differs somewhat from the value of future payments based on benefits earned as of the valuation date.

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, retirement, investment income and salary increases. Decrement assumptions (rates of mortality, separation, 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 appropriate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the normal costs to be paid in the future and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

Actuarial Equivalent. Benefits whose actuarial present values are equal.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Amortization. Payment of an interest-bearing liability by means of periodic contributions of interest and principal, as opposed to a lump sum payment.

Experience Gain (Loss). A measure of the difference between actual experience and experience anticipated by a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” An amortization payment toward the unfunded actuarial accrued liability is in addition to the normal cost.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”

Valuation Assets. The value of current plan assets recognized for valuation purposes.

APPENDIX

10-Year Contribution Projection

This Appendix shows estimated projected contribution requirements for the coming 10 fiscal years, based on the data, methods and assumptions used for this report and assuming a stable population. The ability to make a periodic payment, to certain retirees, as described in Article X: Sub-section 2-246.5 of the Retirement System Ordinance is in part contingent on the level of projected employer contributions for the coming 10 fiscal years. The purpose of the projection is to determine estimated employer contribution rates for the next 10 fiscal years. If the projected employer contribution is 0% for 10 years, the City of Kalamazoo Board may review the remaining requirements in order to determine if a periodic payment may be made. If the projected employer contribution is not 0% for 10 years, a periodic payment may not be made.

The last periodic payment was made during November 2015.

Please note: 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; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

Date	Employer NC%	UAL Payment %	Employer Contribution %
January 1, 2019	14.80%	-51.93%	0.00%
January 1, 2020	14.80%	-47.58%	0.00%
January 1, 2021	14.80%	-43.59%	0.00%
January 1, 2022	14.80%	-39.94%	0.00%
January 1, 2023	14.80%	-36.59%	0.00%
January 1, 2024	14.80%	-33.52%	0.00%
January 1, 2025	14.80%	-30.71%	0.00%
January 1, 2026	14.80%	-28.14%	0.00%
January 1, 2027	14.80%	-25.78%	0.00%
January 1, 2028	14.80%	-23.62%	0.00%



May 3, 2019

Mr. Steve Vicenzi
Director of Management Services/CFO
City of Kalamazoo
241 West South Street
Kalamazoo, Michigan 49007-4796

Dear Mr. Vicenzi:

Please find enclosed five copies of the Sixty-Seventh Annual Actuarial Valuation of the City of Kalamazoo Employees Retirement System.

Based on the projection shown on the last page of the report (Appendix-1), a periodic payment may be made, pending the City of Kalamazoo Pension Board review of any remaining requirements.

Sincerely,

A handwritten signature in black ink that reads "James D. Anderson". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

James D. Anderson, FSA, EA, FCA, MAAA

JDA:dj
Enclosures

cc: Maner Costerisan
Attn: Mr. Aaron Stevens

Electronic Copies:
Steve Vicenzi, City of Kalamazoo
Melissa Fuller, City of Kalamazoo
Lora Ross, City of Kalamazoo
Jennifer Clark, City of Kalamazoo
Aaron Stevens, Maner Costerisan