City of North Kansas City Policemen's and Firemen's Retirement Fund

Actuarial Valuation as of October 1, 2019

McCloud
CONSULTING GROUP

200 W. Mill Street | Liberty, MO 64068 | 816.792.3838 | www.mcgkc.com

November 12, 2019

Board of Trustees
City of North Kansas City
Policemen's and Fireman's Retirement Fund
City Hall, 2010 Howell Street
North Kansas City, MO 64116

Dear Board Members:

This is a report on the actuarial valuation for the City of North Kansas City Policemen's and Firemen's Retirement Fund (The Plan), which was performed as of October 1, 2019. The purpose of the valuation is to:

- Compare the current value of Trust assets with accrued liabilities to assess the funded condition of the Pension Plan,
- Compute the City's recommended contribution rate for the Fiscal Year beginning October 1, 2019.
- Provide accounting disclosure information for the Plan under applicable Governmental Accounting Standards for the Fiscal Year ended September 30, 2019.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices. The employee data was provided by the plan administrator and the Plan asset data was provided by the City administrator. This data has been reviewed for reasonableness, but no attempt has been made to audit such information. Employee data is snapshot data as of the valuation date.

The valuation was based on the provisions of the Plan as amended through the beginning of the Plan Year. Each actuarial assumption used in this valuation is reasonably related to the past experience of the Plan and represents reasonable expectations of future experience under the Plan. The Plan trustees with advice and approval of the actuary set the assumptions and methods for the valuation.

Neither the signing actuary nor the firm of McCloud Consulting Group has a conflict of interest that would impair the objectivity of our work. This report is intended for use by the Plan trustees and should not be used for any purpose other than as stated herein. This report is only valid when presented in its entirety. It must not be reproduced without permission.

The undersigned meets the Qualification Standards for Prescribed Statements of Actuarial Opinion promulgated by the American Academy of Actuaries.

Respectfully submitted,

Traci Miller Christian, EA, MAAA, FCA, MSPA
Enrollment Number 17-06694

John J. Naylor IV, ASA, MAAA

RETIREMENT PLAN ACTUARIES | Traci Miller Christian, EA, MAAA, FCA, MSPA
200 W. Mill Street | Liberty, MO 64068 | P: (816) 792-3838 | F: (816) 792-8350

Table of Contents

Section One: Valuation Summary

Section Two: Actuarial Calculations – Funding

Section Three: Retirement Plan Benefit Provisions

Section Four: Actuarial Assumptions and Methods

Section Five: Valuation Data

Section Six: Accounting Disclosures

Section Seven: Glossary of Terms

Section One:

Valuation Summary

Liabilities and Funded Condition of Pension Plan

	October 1, 2018	October 1, 2019
Actuarial Accrued Liability	$52,460,114	$55,825,371
Actuarial Value of Assets	$53,789,162	$56,426,497
Funded Status of the Plan	102.5%	101.1%

City Computed Contribution Rate

The City's recommended contribution rate was computed as a percentage of active member payroll and assumed to be payable mid-year.

	October 1, 2018	October 1, 2019
Normal Cost *	8.83%	9.33%
Amortization of Unfunded Liability	(1.39)%	(0.58)%
Interest	0.24%	0.28%
Total Computed Contribution	7.69%	9.03%
Anticipated tax-based portion	12.93%	12.39%
City's Net Computed Contribution Rate	0.00%	0.00%

*The Normal Cost is calculated NET of the anticipated percentages of payroll contributions, which are 6.9% of pay from the city and 3.1% of pay from participants.

Pension Fund Experience

The plan measured liabilities $363,757 higher than expected by our assumptions. The Plan experienced an investment loss of $632,649 on market value returns which were 5.37%, and an investment gain of $338,761 on an actuarial (five-year smoothing) basis, where returns were 7.46%. The smoothed asset gain mostly offset a small liability loss and created a net loss of $24,996.

Benefit Provision Changes

There were no changes to the plan provisions from the prior valuation.

Assumption and Method Changes

The valuation implements new Public Safety 2010 (Bottom Quartile) mortality tables for employees and annuitants, projected with generational improvements using scale MP-2018. Previously, the valuation used the RP-2014 at 2006 Blue Collar base tables, projected using the same MP-2018 scale. This change resulted in an increase in plan liabilities of about 1%.

Participant Data

	October 1, 2018	October 1, 2019
Active Members	93	95
Active Member Payroll	$5,491,347	$5,861,423
Average Member's Pay	59,047	61,699
Retirees and Beneficiaries*	80	81
Annual Pensions	$2,623,652	$2,776,792
Vested Terminated	8	8
Deferred Payments	$166,402	$166,402

* Includes DROP Participants

Financial Data

Actuarial Value of Assets*	$53,789,162	$56,426,497
Market Value of Assets	$56,616,911	$58,295,652

*Accumulation of DROP balances as of the valuation date are removed from this value.

Section Two:

Actuarial Calculations – Funding

Actuarial Accrued Liability and Funded Status

	October 1, 2018	October 1, 2019
Active Member Contributions	1,905,611	1,959,127
Retirees and Beneficiaries	25,135,020	26,651,356
Disabled Members	5,135,721	5,318,110
Terminated Vested Members	1,285,735	1,413,526
Active Members (employer-financed portion)	18,998,027	20,483,252
Actuarial Accrued Liability	$52,460,114	55,825,371
Actuarial Value of Assets	53,789,162	56,426,497
Unfunded Actuarial Accrued liability	(1,329,048)	(601,126)
Funded Status of the Plan	102.5%	101.1%

Computed Contribution Rates

The contribution rates shown below are expressed as a percent of active member payroll (under Normal Retirement Age.).

The normal cost can be viewed as the long-term ongoing cost of the Pension Plan.

Accrued liabilities exceeded accrued assets as of October 1, 2015. The excess was amortized as a level percent of payroll over 20 years. This amortization charge was applied to the recommended contribution. Each year since then, increases and decreases in the actuarial liability due to assumption changes and actuarial gains and losses are similarly amortized over 20 years and added to or subtracted from the recommended contribution.

Contribution Recommendation for Fiscal Year Beginning October 1, 2019:

	Dollar Amount	As a Percent Of Current Payroll
Net Normal Cost (excludes % of pay contributions)	$540,748	9.33%
Amortization of Unfunded Liability	(33,870)	(0.58)%
Interest for one half year	16,474	0.28%
Total Computed Contribution	523,352	9.03%
Anticipated Pension Funds Collections from Property Tax Billing	$(718,000)	(12.39)%
Additional Recommended Contribution	**$0**	0.00%

Projection of Funded Status and Recommended Contributions
Assumes the Actuarial Recommended Contribution is Made Each Year

Year	Net Normal Cost	Amortization	Recommended Contribution	Expected Tax Contribution	Additional Recommended	Payroll	Contribution as a % of Payroll	Benefit Payments	Actuarial Value of Assets	Accrued Liability	Unfunded Liability	Funded Ratio
2019	540,748	(33,870)	523,351	718,000	-	5,795,366	9.0%	2,819,396	56,426,497	55,825,371	(601,126)	101.1%
2020	562,378	(99,240)	478,190	725,000	-	6,027,181	7.9%	2,987,712	59,371,503	57,736,097	(1,635,406)	102.8%
2021	584,873	(273,391)	321,606	732,000	-	6,268,268	5.1%	3,199,967	64,022,571	59,644,959	(4,377,612)	107.3%
2022	608,268	(432,870)	181,099	739,000	-	6,518,999	2.8%	3,453,013	68,272,379	61,508,376	(6,764,003)	111.0%
2023	632,599	(614,917)	18,257	746,000	-	6,779,759	0.3%	3,593,181	72,679,741	63,283,263	(9,396,478)	114.8%
2024	657,903	(663,003)	-	753,000	-	7,050,949	0.0%	3,799,299	74,813,254	65,082,479	(9,730,776)	115.0%
2025	684,219	(714,751)	-	761,000	-	7,332,987	0.0%	3,899,326	76,905,238	66,841,656	(10,063,582)	115.1%
2026	711,588	(770,513)	-	769,000	-	7,626,306	0.0%	3,981,442	79,064,220	68,669,967	(10,394,254)	115.1%
2027	740,052	(830,648)	-	777,000	-	7,931,359	0.0%	4,079,495	81,314,250	70,592,718	(10,721,531)	115.2%
2028	769,654	(895,546)	-	785,000	-	8,248,613	0.0%	4,177,989	83,646,040	72,602,011	(11,044,029)	115.2%
2029	800,440	(965,638)	-	793,000	-	8,578,557	0.0%	4,251,742	86,065,748	74,705,526	(11,360,222)	115.2%
2030	832,457	(1,041,397)	-	801,000	-	8,921,700	0.0%	4,334,325	88,605,987	76,937,547	(11,668,441)	115.2%
2031	865,756	(1,123,342)	-	809,000	-	9,278,568	0.0%	4,449,345	91,266,879	79,300,025	(11,966,855)	115.1%
2032	900,386	(1,212,045)	-	817,000	-	9,649,710	0.0%	4,528,666	94,024,238	81,770,775	(12,253,463)	115.0%
2033	936,401	(1,308,136)	-	825,000	-	10,035,699	0.0%	4,591,301	96,922,712	84,396,633	(12,526,080)	114.8%
2034	973,857	(1,412,306)	-	833,000	-	10,437,127	0.0%	4,690,993	99,990,285	87,207,965	(12,782,320)	114.7%
2035	1,012,812	(1,641,013)	-	841,000	-	10,854,612	0.0%	4,771,999	103,201,329	90,181,744	(13,019,585)	114.4%
2036	1,053,324	(1,981,494)	-	849,000	-	11,288,796	0.0%	4,834,521	106,586,175	93,351,129	(13,235,046)	114.2%
2037	1,095,457	(1,662,433)	-	857,000	-	11,740,348	0.0%	4,930,432	110,176,983	96,751,356	(13,425,627)	113.9%
2038	1,139,275	(1,782,345)	-	866,000	-	12,209,962	0.0%	5,016,775	113,954,516	100,366,532	(13,587,983)	113.5%
2039	1,184,846	(2,024,476)	-	875,000	-	12,698,361	0.0%	5,093,351	117,943,245	104,224,226	(13,719,019)	113.2%
2040	1,232,240	(2,049,619)	-	884,000	-	13,206,295	0.0%	5,110,738	122,168,984	108,354,153	(13,814,831)	112.7%
2041	1,281,530	(1,841,972)	-	893,000	-	13,734,547	0.0%	5,132,852	126,710,331	112,839,142	(13,871,190)	112.3%
2042	1,332,791	(1,656,742)	-	902,000	-	14,283,929	0.0%	5,138,071	131,585,085	117,701,575	(13,883,510)	111.8%
2043	1,386,103	(1,413,293)	-	911,000	-	14,855,286	0.0%	5,153,913	136,834,610	122,987,780	(13,846,831)	111.3%

Uses 6.5% assumed rate of return and discount rate. Assumes recommended contribution is made.

The results presented here are ESTIMATES. They are based on the data, assumptions, methods and plan provisions outlined in this report.
These results are for **discussion purposes only** and should not be relied upon for purposes of making cash contributions to the Plan nor for any other purposes.

Schedule of Amortization of Unfunded Liability

Twenty-year Amortization of Historical Components of the Unfunded Actuarial Liability

Description	Initial Amount	Remaining Period	Outstanding Balance*	Payment This Year
10/1/15 UAL	$850,634	16	$832,018	$61,771
10/1/16 Change Mortality	2,034,904	17	2,010,981	142,086
10/1/16 Actuarial Gain	(523,917)	17	(517,757)	(36,582)
10/1/17 Change Mortality	(1,040,818)	18	(1,035,683)	(69,879)
10/1/17 Actuarial Gain	(2,545,234)	18	(2,532,678)	(170,885)
10/1/18 Change Withdrawal	649,332	19	648,613	41,919
10/1/18 Actuarial Gain	(740,469)	19	(739,648)	(47,802)
10/1/19 Change Mortality	708,032	20	708,032	43,950
10/1/19 Actuarial Loss	24,996	20	24,966	1,552
Total			$(601,126)	$(33,870)

*The total of the outstanding balances equals the current Unfunded Actuarial Liability.

Amounts are amortized as a level percent of pay, so will increase each year by the base salary scale, currently 4.0%.

Recommended City Contributions

These recommended contributions are in addition to anticipated percentage of payroll contributions: 6.9% from the city and 3.1% of pay from participants.

Valuation Date: October 1	Computed City Dollar Contributions	Percent of Payroll
2008	1,192,596	22.4
2009	1,432,875	24.8
2010	1,413,105	25.5
2011	1,546,257	27.8
2012	1,382,311	27.4
2013	890,916	17.8
2014	710,503	13.6
2015	658,361	12.9
2016	846,280*	16.6*
2017	595,057	11.9
2018	422,048	7.7
2019	**523,352**	**9.0%**

*Generational mortality tables were first used in the 2016 valuation

Comments and Conclusion

The valuation employs a new base mortality table, which increased measured liability by $708 thousand. Since the expected tax revenues earmarked for the plan exceed the recommended contribution, this change has no impact on additional contributions to be made by the City.

The Plan experienced an investment loss of over $632,649 on a market value basis, reflecting a return of 5.4%. Twenty percent of those losses are recognized in the actuarial (smoothed) asset value, and the remainder will be recognized over the next four years. Prior year gains and losses are also being phased in to the smoothed asset value, which is currently 97.5% of the market value.

Maintaining current funding practices will keep the plan well funded.

History of Assets and Accrued Liabilities

Valuation Date October 1:	Valuation Assets	Actuarial Accrued Liabilities	Funded Ratio	Unfunded Actuarial Accrued Liabilities
2008	33,999,722	38,836,397	87.5	4,836,675
2009	34,040,208	40,953,104	83.1	6,912,896
2010	34,635,613	42,049,757	82.4	7,414,144
2011	34,604,534	44,441,255	77.9	9,836,721
2012	39,322,148	45,859,772	85.7	6,537,624
2013	42,131,291	45,675,222	92.2	3,543,931
2014	46,376,930	46,677,818	99.4	300,888
2015	46,574,127	47,424,761	98.2	850,634
2016	48,471,548	50,832,226*	95.4	2,360,678*
2017	51,220,665	49,990,363	102.5	(1,230,302)
2018	53,789,162	52,460,114	102.5	(1,329,048)
2019	**56,426,497**	**55,825,371**	**101.1**	**(601,126)**

*Generational mortality was first used in the 2016 valuation.

History of Market Value Asset Returns

Year Ended Sept. 30	Rate of Investment Return
2008	(14.7%)
2009	3.8%
2010	9.9%
2011	0.8%
2012	18.8%
2013	11.6%
2014	8.8%
2015	(0.9%)
2016	10.1%
2017	13.3%
2018	7.6%
2019	**5.4%**

Valuation History

2019
The mortality table was updated to the Public Safety 2010 (Bottom Quartile) tables for employees and annuitants, projected with generational improvements using scale MP-2018. This change increased the measurement of actuarial liability by $708 thousand. As a result, the funded status is 101.1%, whereas it would have been 102.4% using the previous mortality tables.

2018
A new withdrawal table was implemented based on an experience study that was preformed in May 2018. This change increased the actuarial liability by almost $650 thousand. Without this change, the plan's funded status would have been 103.8%, rather than 102.5% with the new turnover assumption.

2017
The mortality projection scale was updated to MP-2017. Downward adjustments in the new mortality projection scale caused the change in mortality to decrease plan liabilities by roughly $1 million. The funded status would have been 100.4% under the previous mortality projection scale. Favorable demographic experience and asset returns produced $2.55 million of actuarial gains.

2016
The mortality tables were updated to RP-2014 Blue Collar tables at 2006, with generational improvements using the most recently available projection scale (MP-2015), reflecting the most recently published research. This was the first year that generational mortality tables were used, and added $2 million to the Actuarial Liability, resulting in a drop in the funded status to 95.4%. The funded status would have been 99.3% under the previous mortality assumption.

2015
The mortality table was updated to the RP-2014 Blue Collar table, without generational projection. The asset smoothing method was revised slightly in this valuation to base the five-year smoothing on gradual recognition of asset gains and losses, rather than adding the five-year average gain to expected assets.

2013
City Contributions were increased from 3.9% to 6.9 of payroll. Employee Contributions increased from 1.1% to 3.1% of payroll. Employees are now required to continue making employee contributions until actual separation of employment (including time in the DROP).

Section Three:

Retirement Plan Benefit Provisions

Benefit Provision Summary

Effective Date
November 6, 1956

Eligibility
All policemen and firemen of the City of North Kansas City are eligible to Participate in the Plan on their employment date unless otherwise excluded by contract.

Average Monthly Salary
Highest 36 consecutive month average out of the last 60 months prior to termination or retirement.

Normal Retirement Date
Normal Retirement is the first of the month coincident with or immediately following the attainment of age 55 and 10 years of Service. Early Retirement is age 45 with 25 Years of Service.

Benefit Formula
2.5% times Average Monthly Salary at actual retirement or termination, times Years of Service up to 20, plus 1% times Average Monthly Salary times Years of Service in excess of 20 but not exceeding 30.

Normal Form
The retirement benefit shall be payable for the Member's lifetime only with an actuarial Equivalent 50% Joint and Survivor Benefit for married participants.

Vesting
A Member who has ten or more years of service is entitled to a benefit at his Normal Retirement Date and shall be considered 100% vested. The Member's benefit at Normal Retirement Date is his accrued benefit unless the terminated Member elects to withdraw his Member contributions with interest in lieu of any other Plan benefits.

Pre-Retirement Death Benefit
A Participant's spouse is entitled to 50% of the Accrued Benefit, reduced for joint life expectancy, payable when the participant would have otherwise reached eligibility for benefits.

Duty Disability Benefit
The greater of a or b, or for Active Members who were Active Members on August 22, 1994 the greatest of a, b, and c:

a) 50% of Average Monthly Salary for the 12 months preceding the date of retirement.
b) Projected Normal Retirement Benefit at age 55 assuming continued employment and Average Monthly Salary at the time of disability.
c) 60% of Average Monthly Salary calculated as of August 22, 1994 and paid until the earlier of death, recovery or Normal Retirement.

Cost of Living Adjustment (COLA)

Monthly Benefits of Members retiring or becoming disabled on or after August 23, 1994 will be increased on each January 1 thereafter. Such increase will be the lesser of the Social Security COLA as of the immediately preceding December 1 or 3%, but not less than 1%. The COLA will be prorated for benefits commencing other than on January 1.

Member Contributions

3.1% of Base Pay Upon non-vested termination, the Member's contributions may be returned with interest at the Federal Mid-Term Rate compounded annually in effect as of each October 1.

City % of Pay Contributions

6.9% of Base Pay

Section Four:

Actuarial Assumptions And Methods

Actuarial Assumptions

Economic Assumptions

(i) Interest Rate

6.5% (net of all expenses)

(ii) Salary Increases

Salary scale consists of a 4% inflation component and an age-based merit scale that uses 2.5% increases up to age 35, 2.0% increases from age 36 to 40, 1.0% increases from age 41 to 45, and 0.0% increases after age 45.

Demographic Assumptions

(i) Mortality

Public Safety 2010 (Bottom Quartile) tables for employees and annuitants, projected with generational improvements using the scale MP-2018 for this valuation. (previously the base table was RP 2014 at 2006 for Blue Collar employees and annuitants)
For disabled mortality, the Healthy Annuitant Mortality Table is set forward five years.

(ii) Sample Rates of Termination

Termination rates are based on age. Sample rates are as follows:

Age	Annual Rates of Termination
20	19.5%
28	13.0%
36	6.9%
44	4.5%
52+	0.0%

(iii) Disability

Sample annual rates of disability are as follows:

Age	Rate
25	0.15%
30	0.20%
40	0.50%
50	0.80%

(iv) Retirement

Age	Percent Retiring
45-49	5%
50-54	10%
Age 55	30%
56-64	20%
Age 65	100%

(v) Marital Status — 75% of participants are assumed to be married with males 3 years older than their female spouses.

(vi) Cost of Living Increases — 2.0%

(vii) Expenses — Administrative expenses will be paid by the Plan

Assumptions for Actuarial Projections

(i) Normal Cost Growth	4.0% per year
(ii) Tax Contribution Increases	1.5%
(iii) Annual Payroll Growth	4.0%
(iv) Annual Investment Return	6.5%

Experience Study and Assumption Review

Demographic and economic experience studies and assumption reviews are recommended about every 5 years. Periodic studies and reviews help to insure that the assumptions used in the valuation are based on the best information we have available to us.

The last assumption review for this plan was done in May of 2018.

Actuarial Method Used for the Valuation

Normal Cost

Normal cost and the allocation of actuarial present values between service rendered before and after the valuation date were determined using an individual entry age actuarial cost method having the following characteristics:

- ❖ The annual normal costs for each individual active member, payable from date of hire to date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement;
- ❖ Each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.
- ❖ In calculating the Normal Cost for purposes of the City's recommended contribution rate, it is assumed that the employees will contribute at a rate of 3.1% of eligible payroll and the City is contributing at a rate of 6.9% of eligible payroll.

Financing of Unfunded Actuarial Accrued Liability

New components of unfunded actuarial liability arise when assumptions or methods change, when the plan is amended, or due to annually-measured actuarial gains or losses. Each new component of unfunded liability is amortized over a fixed period, and as a level percent of pay.

Active member payroll is assumed to increase at the base salary increase rate for the purpose of determining the level percent-of-payroll full funding credit.

Actuarial Value of Assets.

Asset gains and losses are recognized over five years. Actuarial Value is not allowed to be less than 80% nor more than 120% of the current year's Market Value. Inasmuch as accumulated DROP balances are not valued as plan liabilities, they are removed from the Actuarial Value so contribution calculations will not be understated.

Assessment and Disclosure of Risk

The Actuarial Standards of Practice require the plan's actuary to assess certain risks to the plan. Specifically, the impact of future events that may differ significantly from the assumptions used to produce the current actuarial valuation. The purpose of this information is to make the plan sponsor aware of such risks. For a more detailed analysis of any of these items, please contact our office.

Assumptions: Actuarial assumptions such as interest rates, rates of retirement and withdrawal as well as mortality tables used for calculating the actuarially recommended contribution are important factors. Each actuarial assumption used in this valuation is reasonably related to the past experience of the Plan and represents reasonable expectations of future experience under the Plan. With advice from the actuary, the trustees approve the assumptions for the valuation. When actual plan experience deviates from what is expected, the resulting gain or loss is amortized over future years and becomes part of the recommended contribution. If there is a decrease in the assumed future return on plan investments, the overall funding requirement, barring other mitigating circumstances, will increase. Updates to mortality tables often extend life expectancies, which also results in an increase to plan liabilities.

Contribution Risk: Funding less than the actuarially recommended contribution will not typically fully fund the Plan on a long term basis. If the Plan is underfunded, additional contributions may be required.

Investment Risk: Plan assets include contributions and asset earnings. The Plan's investment portfolio should take into consideration the funded status of the Plan, anticipated future contribution levels, and the expected future years of the Plan. Investment performance may have a significant impact on future required contributions to fully fund the Plan on a long-term basis.

Demographic Risk: Demographic changes from year to year can have a significant impact on valuation results.

Section Five:

Valuation Data

Summary of Asset Information Submitted for the Valuation

Statement of Assets

As of October 1, 2019, the market value of Pension Plan assets was reported to be $58,295,652.

Market Value of Assets as of October 1, 2018	$56,616,911
a. Revenues	
(i) Employer Contributions (Tax levy + City)	730,000
(ii) Employer Contributions (6.9% of payroll)	396,830
(iii) Employee Contributions (3.1% of payroll)	178,117
(iv) Investment Income (Net of plan expenses)	3,004,367
b. Disbursement to Members	
(i) Benefits Paid	(2,630,573)
c. Market Value as of October 1, 2019	58,295,652

The plan's Deferred Retirement Option Program (DROP) has four current participants with accumulated DROP balances of $400,799 as of the current valuation date. The computation of the plan's Actuarial Value of Assets, shown on the following page, is reduced by the amount of the accumulated balances so that recommended contribution amounts are not understated.

Actuarial Value of Assets

(1) Market Value of Assets at end of prior year	56,616,911
(2) Contributions for the year – Employer	1,126,830
Contributions for the year – Employee	178,117
(3) Benefit Payments	(2,630,573)
(4) Expected Investment Return	
On Beginning Value	3,680,099
On Contributions	42,411
On Benefit Payments	(85,494)
Total	3,637,016
(5) Expected Assets at Year-end	58,928,300
(6) Market Value of Assets at Year-end	58,295,652
(7) Excess of Market over Expected Assets	(632,649)
(8) Unrecognized gains / (losses)	
(a) 80% of the year just ended (80% x (7))	(506,119)
(b) 60% of two years prior	339,171
(c) 40% of three years prior	1,310,713
(d) 20% of four years prior	324,591
(e) Total unrec. gains / (losses) (sum of (a)–(d))	1,468,356
(9) Smoothed Asset Value (6) - (8e), 80-120% of (6)	56,827,296
(10) DROP Account Balances	400,799
(11) Actuarial Value of Assets (9) - (10)	56,426,497

Rate of Return – Actuarial Value, net of expenses	7.46%
Rate of Return – Market Value, net of expenses	5.37%

Participant Summary

Retirees and Beneficiaries Included in the Valuation

There were 81 retirees and beneficiaries (including 4 DROP participants) included in the valuation, with annual pensions totaling $2,776,792. The breakdown by age division is as follows:

Attained Ages	Number	Average Annual Pensions
40-44		
45-49	1	$39,801
50-54	1	37,750
55-59	14	32,989
60-64	10	44,590
65-69	18	34,162
70-74	16	39,411
75-79	7	34,553
Over 80	14	21,724
Total	81	$34,281

Pensions Being Paid

Valuation Date October 1	No.	Annual Pensions	% of Active Payroll	Average Pension	Discounted Value of Pensions	
					Total	Average
2011	74	1,939,476	34.8	26,209	23,133,378	312,613
2012	76	2,119,575	42.0	27,979	26,339,864	346,577
2013	77	2,230,123	44.5	28,963	26,395,308	342,796
2014	77	2,241,599	43.0	29,112	26,200,434	340,265
2015	77	2,365,178	46.3	30,717	26,427,421	343,213
2016	81	2,552,718	49.9	31,515	30,693,382	378,931
2017	80	2,539,650	50.7	31,746	29,813,856	372,673
2018	80	2,623,652	47.8	32,796	30,270,741	378,384
2019	81	2,776,792	47.4	34,281	31,969,466	394,685

Vested Terminated Members Included in the Valuation

There were 8 vested terminated members included in the valuation, with annual pensions totaling $166,402. The breakdown is as follows:

Attained Ages	Number	Average Annual Pensions
35-39	1	$21,225
40-44	3	22,557
45-49	1	20,709
50-54	3	18,933
55-59		
Total	8	$20,800

Active Members – Age and Service Distribution

	Service							
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**Over 30**	**Total**
20 - 24	6							6
25 - 29	13							13
30 - 34	11							11
35 - 39	6	3	12	2				23
40 - 44	1		4	3				8
45 - 49			1	2	2	1		6
50 - 54	1		1	5	4	6		17
55 - 59		1			1	4	1	7
60 - 64					1	2	1	4
65+								
Total	38	4	18	12	8	13	2	95

Total Active Participant Information

	2019	2018	2017
Active Members	95	93	85
Valuation Payroll	5,861,423	5,491,347	5,007,936
Average Compensation	61,699	59,047	58,917
Average Age (yrs.)	40.9	40.9	41.7
Average Service (yrs.)	12.1	12.2	13.2

Reconciliation With Prior Year

	Actives	Retirees & Beneficiaries	Disabled	Vested Terminations
October 1, 2018 Participants	93	66	14	8
Corrections				
New Participants	11			
Returned to Active				
Retirements	(2)	2		
Deaths		(1)		
New Beneficiaries				
Benefits Expire				
Terminations				
- Vested				
- Non-vested*	(7)			
October 1, 2019 Participants	95	67	14	8

*Participants who terminate without vested benefits receive a return of their contributions, accumulated with interest.

Participants who have stopped accruing benefits under the DROP are counted as retirees in this presentation.

Section Six:

Accounting Disclosures

The information presented in these schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation Date:	October 1, 2019
Actuarial Cost Method:	Entry Age Normal
Amortization method:	Level percent of payroll, fixed bases are created each year
Amortization period:	20 years
Actuarial assumptions:	
Investment rate of return	6.5%*
Projected salary increases	4.0% base

*The long-term expected rate of return on investments was determined using a building block method in which best-estimate ranges of expected future real rates of return (expected returns, net of investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rate of return by the target asset allocation percentage and by adding expected inflation, 2.5%. Estimates of arithmetic real rates of return for each major asset class included in the Fund's target asset allocation as of September 30, 2019 are summarized below:

Asset Class	Target Asset Allocation	Long-Term Expected Real Rate of Return
Fixed Income	25%	2.0%
Equity Securities	65%	5.5%
Real Estate	10%	3.5%

Membership data is detailed in Section Five of this report.

Funding Progress

Actuarial Valuation as of Oct. 1,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (b)-(a)	Percent Funded (a)/(b)	Annual Covered Payroll (c)	Unfunded AAL as a Percentage of Covered Payroll ((b-a)/c)
2008	34.000	38.836	4.837	87.5	5.318	91.0
2009	34.040	40.953	6.913	83.1	5.859	118.0
2010	34.636	42.050	7.414	82.4	5.669	131.0
2011	34.605	44.441	9.837	77.9	5.571	177.0
2012	39.322	45.860	6.538	85.7	5.049	129.5
2013	42.131	45.675	3.544	92.2	5.015	70.7
2014	46.377	46.678	0.301	99.4	5.213	5.8
2015	46.574	47.425	0.851	98.2	5.112	16.6
2016	48.471	50.832	2.360	95.4	5.112	46.2
2017	51.220	49.990	(1.230)	102.5	5.008	(24.6)
2018	53.789	52.460	(1.329)	102.5	5.491	(24.2)
2019	56.426	55.825	(0.601)	101.1	5.861	(10.3)

Dollar amounts in millions.

Schedule of Contributions

Year Ended	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution	Contribution Deficiency (Excess)	Covered Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
9/30/2015	1,070,230	1,043,030	27,200	5,213,425	20.01%
9/30/2016	1,011,064	1,047,105	(36,041)	5,111,644	20.48%
9/30/2017	1,199,032	1,195,815	3,217	5,112,351	23.39%
9/30/2018	940,605	1,093,914	(153,309)	5,007,936	21.84%
9/30/2019	800,951	1,126,830	(325,878)	5,491,347	20.52%

Pension Expense for Year Ended September 30, 2019

Service cost	$ 1,034,219
Interest on the total pension liability	3,391,638
Employee contributions	(178,117)
Projected earnings on pension plan investments	(3,637,016)
Pension plan administrative expense	193,174
Outflows / (inflows) of resources recognized in the current year due to	
Difference between expected and actual experience	(177,218)
Changes of assumptions	297,998
Difference between projected and actual earnings on plan investments	(275,081)
Pension expense	$ 649,597

Changes in the Net Pension Liability

	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) – (b)
Balances at 9/30/18	$ 52,460,114	$ 56,616,911	$ (4,156,797)
Changes for the year			
Service cost	1,034,219		1,034,219
Interest	3,391,638		3,391,638
Difference between expected and actual experience	861,941		861,941
Contributions - employer		1,126,830	(1,126,830)
Contributions - employee		178,117	(178,117)
Net investment income		3,197,541	(3,197,541)
Benefit payments, including refunds	(2,630,573)	(2,630,573)	
Administrative expense		(193,174)	193,174
Changes of Assumptions	708,032		708,032
Other changes	--	--	--
Net changes	$ 3,365,257	$ 1,678,741	$ 1,686,516
Balances at 9/30/19	$ 55,825,371	$ 58,295,652	$ (2,470,281)

Statement of Outflows and Inflows Arising During the Current Period

1. Difference between expected and actual experience of the TPL (gains) / losses	$ 861,941
2. Assumption Changes	708,032
3. Recognition period: Average of the expected remaining service lives of all plan participants (in years)	4.733
4. Difference between expected and actual return on plan investments	632,649
5. Outflow (Inflow) of Resources to be recognized in the current pension expense:	
a. for the difference between expected and actual experience of the TPL, (1) / (3)	182,113
b. for assumption changes, (2) / (3)	149,595
c. for the difference between expected and actual return on plan investments, (4) / 5	126,530

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

	1% Decrease 5.5%	Current Single Discount Rate Assumption 6.5%	1% Increase 7.5%
Total Pension Liability	$62,183,060	$55,825,371	$50,531,933
Plan Fiduciary Net Position	58,295,652	58,295,652	58,295,652
Net Pension Liability / (Asset)	$ 3,887,408	$ (2,470,281)	$ (7,763,719)

Deferred Outflows and Deferred Inflows of Resources to be Recognized in Future Years

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 772,417	$ 1,287,592
Changes in Assumptions	1,843,719	769,390
Net difference between projected and actual earnings on pension plan investments		1,468,355
Total	$ 2,616,136	$ 3,525,337

Year	Net Deferred Outflows of Resources
2020	$ (845,693)
2021	(468,075)
2022	280,038
2023	67,139
2024	57,390
Thereafter	-
Total	$ (909,201)

Section Seven:

Glossary of Terms

Glossary of Terms

Accrued Benefit
The benefit earned by a participant payable in the form of a monthly benefit commencing at normal retirement age.

Actuarial Accrued Liability
The actuarial present value of benefits earned as of the valuation date.

Actuarial Gain or Loss
The difference between the plan's actual experience and expected experience based on the actuarial assumptions used in the valuation.

Actuarial Value of Assets
The value of assets as determined by the actuary for the purpose of the valuation. This may or may not include a method of smoothing investment gains and losses over time.

Amortization
The spreading of liabilities or costs over a period of years. A plan's unfunded actuarial accrued liability is amortized over a period of years.

Entry Age Normal Actuarial Cost Method
An actuarial method for determining the annual normal cost and the actuarial accrued liability of a pension plan. Under this method, the annual normal cost is the level amount that would have to be contributed each year from the time each employee entered employment so that his pension will be fully funded by his assumed retirement age.

Normal Cost
That portion of the actuarial present value of plan benefits and expenses allocated to the valuation year.

Present Value
The value of a benefit payment or series of benefit payments determined as of the valuation date by the application of a particular set of actuarial assumptions. It is the single sum which reflects the time value of money (through discounts for investment yield) and the probabilities of payment (taking into account death, disability, withdrawal and age at retirement).

Unfunded Actuarial Accrued Liability
The excess of the actuarial accrued liability over the actuarial value of assets.

Vested Benefit
A benefit that is not forfeited if the participant leaves employment.