

CITY OF EVANSTON
FIREFIGHTERS' PENSION FUND
ACTUARIAL VALUATION
AS OF JANUARY 1, 2020
CONTRIBUTIONS APPLICABLE TO THE
PLAN/FISCAL YEAR ENDING DECEMBER 31, 2021



FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

July 30, 2020

Board of Trustees
City of Evanston
Firefighters' Pension Fund
2100 Ridge Avenue
Evanston, IL 60201

Re: Actuarial Valuation Report – City of Evanston Firefighters' Pension Fund

Dear Board:

We are pleased to present to the Board this report of the annual actuarial valuation of the City of Evanston Firefighters' Pension Fund. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and to develop the appropriate funding requirements for the applicable plan year. Please note that this valuation may not be applicable for any other purposes.

The valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board, and reflects laws and regulations issued to date pursuant to the provisions of Article 4, Illinois Pension Code, as well as applicable federal laws and regulations. In our opinion, the assumptions used in this valuation, as adopted by the Board of Trustees, represent reasonable expectations of anticipated plan experience. Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including: changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations. Due to the limited scope of the valuation, we did not perform an analysis of the potential range of such future measurements.

In conducting the valuation, we have relied on personnel, plan design, and asset information supplied by the Board, financial reports prepared by the custodian bank and the actuarial assumptions and methods described in the Actuarial Assumptions section of this report. While we cannot verify the accuracy of all this information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy of the information and believe that it has produced appropriate results. This information, along with any adjustments or modifications, is summarized in various sections of this report.

The undersigned is familiar with the immediate and long-term aspects of pension valuations and meets the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All of the sections of this report are considered an integral part of the actuarial opinions.

To our knowledge, no associate of Foster & Foster, Inc. working on valuations of the program has any direct financial interest or indirect material interest in the City of Evanston, nor does anyone at Foster & Foster, Inc. act as a member of the Board of Trustees of the City of Evanston Firefighters' Pension Fund. Thus, there is no relationship existing that might affect our capacity to prepare and certify this actuarial report.

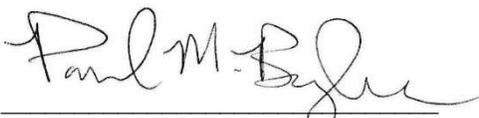
If there are any questions, concerns, or comments about any of the items contained in this report, please contact us at 630-620-0200.

Respectfully submitted,

Foster & Foster, Inc.

By: 
Jason L. Franken, FSA, EA, MAAA

By: 
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Enclosures

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SUMMARY OF REPORT

The regular annual actuarial valuation of the City of Evanston Firefighters' Pension Fund, performed as of January 1, 2020, has been completed and the results are presented in this Report. The contribution amounts set forth herein are applicable to the plan/fiscal year ended December 31, 2021.

The contribution requirements, compared with those set forth in the January 1, 2019 actuarial report, are as follows:

Valuation Date Applicable to Fiscal Year Ending	1/1/2020 <u>12/31/2021</u>	1/1/2019 <u>12/31/2020</u>
Total Recommended Contribution	\$11,148,400	\$10,696,741
% of Projected Annual Payroll	105.0%	104.4%
Member Contributions (Est.)	1,004,135	968,898
% of Projected Annual Payroll	9.5%	9.5%
City Recommended Contribution	10,144,265	9,727,843
% of Projected Annual Payroll	95.5%	94.9%

As you can see, the Total Recommended Contribution shows an increase when compared to the results determined in the January 1, 2019 actuarial valuation report. The increase is primarily attributable to Tier 2 benefit changes.

Plan experience was unfavorable overall on the basis of the plan's actuarial assumptions. Sources of unfavorable experience included the disablement of 1 active employee, lower than expected inactive mortality, and an investment return of 5.91% (Actuarial Asset Basis) which fell short of the 6.25% assumption. These losses were offset in part by gains associated with an average salary increase of 2.57% which fell short of the 4.21% assumption and fewer retirements than expected.

CHANGES SINCE PRIOR VALUATION

Plan Changes Since Prior Valuation

As a result of Public Act 101-0610, signed into law on December 18, 2019, the following updates were made to the Tier 2 benefits:

- The surviving spouse benefit for non-line of duty death was updated to mirror Tier 1 benefits, whereby Tier 2 surviving spouses will now receive 54% of final average salary, even prior to achieving vesting at 10 years of service.
- The pensionable salary cap increased retroactive to 2011 to alleviate safe harbor concerns, updating the annual adjustment to be CPI-U instead of 50% of CPI-U. The 3% annual growth cap remains in place.
- The final average salary was increased from averaging the highest consecutive 96 of the last 120 months of salary to averaging the highest consecutive 48 of the last 60 months of salary.

Actuarial Assumption/Method Changes Since Prior Valuation

There were no assumption or method changes since the prior valuation.

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	New Benefits <u>1/1/2020</u>	Old Benefits <u>1/1/2020</u>	<u>1/1/2019</u>
A. Participant Data			
Number Included			
Actives	102	102	99
Service Retirees	81	81	83
Beneficiaries	42	42	39
Disability Retirees	23	23	22
Terminated Vested	<u>2</u>	<u>2</u>	<u>2</u>
Total	250	250	245
Total Annual Payroll	\$10,620,145	\$10,620,145	\$10,247,468
Payroll Under Assumed Ret. Age	10,620,145	10,620,145	10,247,468
Annual Rate of Payments to:			
Service Retirees	6,389,074	6,389,074	6,344,105
Beneficiaries	1,754,694	1,754,694	1,595,604
Disability Retirees	1,530,265	1,530,265	1,442,796
Terminated Vested	0	0	0
B. Assets			
Actuarial Value	85,683,402	85,683,402	81,390,583
Market Value	89,807,041	89,807,041	75,776,118
C. Liabilities			
Present Value of Benefits			
Actives			
Retirement Benefits	79,414,860	76,448,302	72,671,668
Disability Benefits	8,892,391	8,545,837	8,442,996
Death Benefits	1,182,771	1,008,248	952,215
Vested Benefits	3,045,010	2,953,484	2,897,715
Service Retirees	93,168,268	93,168,268	95,188,771
Beneficiaries	16,219,512	16,219,512	14,906,949
Disability Retirees	23,282,274	23,282,274	22,474,714
Terminated Vested	<u>66,799</u>	<u>66,799</u>	<u>66,799</u>
Total	225,271,885	221,692,724	217,601,827

C. Liabilities - (Continued)	New Benefits <u>1/1/2020</u>	Old Benefits <u>1/1/2020</u>	<u>1/1/2019</u>
Present Value of Future Salaries	116,390,061	112,068,465	115,238,425
Present Value of Future Member Contributions	11,004,680	10,596,073	10,895,793
Normal Cost (Retirement)	2,395,645	2,285,684	2,267,212
Normal Cost (Disability)	483,698	474,691	460,268
Normal Cost (Death)	81,708	71,701	65,012
Normal Cost (Vesting)	<u>166,737</u>	<u>163,605</u>	<u>165,517</u>
Total Normal Cost	3,127,788	2,995,681	2,958,009
Present Value of Future Normal Costs	31,227,874	28,542,122	29,802,091
Accrued Liability (Retirement)	55,203,270	54,394,292	49,566,538
Accrued Liability (Disability)	4,036,929	3,970,469	3,679,324
Accrued Liability (Death)	298,588	303,569	280,236
Accrued Liability (Vesting)	1,768,371	1,745,419	1,636,405
Accrued Liability (Inactives)	<u>132,736,853</u>	<u>132,736,853</u>	<u>132,637,233</u>
Total Actuarial Accrued Liability	194,044,011	193,150,602	187,799,736
Unfunded Actuarial Accrued Liability (UAAL)	108,360,609	107,467,200	106,409,153
Funded Ratio (AVA / AL)	44.2%	44.4%	43.3%

	New Benefits <u>1/1/2020</u>	Old Benefits <u>1/1/2020</u>	<u>1/1/2019</u>
D. Actuarial Present Value of Accrued Benefits			
Vested Accrued Benefits			
Inactives	132,736,853	132,736,853	132,637,233
Actives	21,515,012	21,433,211	18,521,475
Member Contributions	<u>10,540,469</u>	<u>10,540,469</u>	<u>9,841,269</u>
Total	164,792,334	164,710,533	160,999,977
Non-vested Accrued Benefits	<u>4,346,388</u>	<u>4,326,848</u>	<u>4,319,079</u>
Total Present Value Accrued Benefits	169,138,722	169,037,381	165,319,056
Funded Ratio (MVA / PVAB)	53.1%	53.1%	45.8%
Increase (Decrease) in Present Value of Accrued Benefits Attributable to:			
Plan Amendments	101,341	0	
Assumption Changes	0	0	
New Accrued Benefits	0	3,311,424	
Benefits Paid	0	(9,624,766)	
Interest	0	10,031,667	
Other	<u>0</u>	<u>0</u>	
Total	101,341	3,718,325	

Valuation Date	New Benefits	Old Benefits	
Applicable to Fiscal Year Ending	<u>1/1/2020</u>	<u>1/1/2020</u>	<u>1/1/2019</u>
	<u>12/31/2021</u>	<u>12/31/2021</u>	<u>12/31/2020</u>
E. Pension Cost			
Normal Cost ¹	\$3,323,275	\$3,182,911	\$3,142,885
% of Total Annual Payroll ¹	31.3	30.0	30.7
Administrative Expenses ¹	103,687	103,687	117,677
% of Total Annual Payroll ¹	1.0	1.0	1.1
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 21 years (as of 1/1/2020) ¹	7,721,438	7,651,645	7,436,179
% of Total Annual Payroll ¹	72.7	72.0	72.6
Total Recommended Contribution	11,148,400	10,938,243	10,696,741
% of Total Annual Payroll ¹	105.0	103.0	104.4
Expected Member Contributions ¹	1,004,135	1,004,135	968,898
% of Total Annual Payroll ¹	9.5	9.5	9.5
Expected City Contribution	10,144,265	9,934,108	9,727,843
% of Total Annual Payroll ¹	95.5	93.5	94.9
F. Past Contributions			
Plan Years Ending:	<u>12/31/2019</u>		
Total Recommended Contribution	9,665,299		
City	8,711,187		
Actual Contributions Made:			
Members (excluding buyback)	954,112		
City	<u>8,266,584</u>		
Total	9,220,696		
G. Net Actuarial (Gain)/Loss	704,743		

¹ Contributions developed as of 1/1/2020 displayed above have been adjusted to account for assumed interest.

H. Schedule Illustrating the Amortization of the Total Unfunded Actuarial Accrued Liability as of:

<u>Year</u>	<u>Projected Unfunded Accrued Liability ¹</u>
2020	88,956,208
2021	86,794,533
2022	84,497,753
2027	70,672,563
2032	51,952,134
2036	32,305,497
2041	0

¹ Target funded percentage is less than 100% so not all of the Unfunded Actuarial Accrued Liability is amortized.

I. (i) 3 Year Comparison of Actual and Assumed Salary Increases

		<u>Actual</u>	<u>Assumed</u>
Year Ended	12/31/2019	2.57%	4.21%
Year Ended	12/31/2018	7.51%	4.27%
Year Ended	12/31/2017	2.02%	4.36%

(ii) 3 Year Comparison of Investment Return on Actuarial Value

		<u>Actual</u>	<u>Assumed</u>
Year Ended	12/31/2019	5.91%	6.25%
Year Ended	12/31/2018	3.73%	6.25%
Year Ended	12/31/2017	6.36%	6.25%

DEVELOPMENT OF JANUARY 1, 2020 AMORTIZATION PAYMENT

(1) Unfunded Actuarial Accrued Liability as of January 1, 2019	\$106,409,153
(2) Sponsor Normal Cost developed as of January 1, 2019	1,989,111
(3) Expected administrative expenses for the year ended December 31, 2019	110,755
(4) Expected interest on (1), (2) and (3)	6,778,353
(5) Sponsor contributions to the System during the year ended December 31, 2019	8,266,584
(6) Expected interest on (5)	258,331
(7) Expected Unfunded Actuarial Accrued Liability as of December 31, 2019, (1)+(2)+(3)+(4)-(5)-(6)	106,762,457
(8) Change to UAAL due to Benefits Change	893,409
(9) Change to UAAL due to Actuarial (Gain)/Loss	704,743
(10) Unfunded Accrued Liability as of January 1, 2020	108,360,609
(11) UAAL Subject to Amortization (90% AAL less Actuarial Assets)	88,956,208

<u>Date</u> <u>Established</u>	<u>Years</u> <u>Remaining</u>	<u>1/1/2020</u> <u>Amount</u>	<u>Amortization</u> <u>Amount</u>
1/1/2020	21	88,956,208	7,267,236

DETAILED ACTUARIAL (GAIN)/LOSS ANALYSIS

(1) Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2019	\$106,409,153
(2) Expected UAAL as of January 1, 2020	106,762,457
(3) Summary of Actuarial (Gain)/Loss, by component:	
Investment Return (Actuarial Asset Basis)	276,758
Salary Increases	(929,025)
Active Decrements	197,415
Inactive Mortality	594,053
Other	<u>565,542</u>
Change in UAAL due to (Gain)/Loss	704,743
Change to UAAL due to Benefits Change	<u>893,409</u>
(4) Actual UAAL as of January 1, 2020	\$108,360,609

RECONCILIATION OF CHANGES IN CONTRIBUTION REQUIREMENT

(1) Contribution Determined as of January 1, 2019	\$ 9,727,843
(2) Summary of Contribution Impact by component:	
Change in Normal Cost	40,026
Change in Assumed Administrative Expense	(13,990)
Investment Return (Actuarial Asset Basis)	19,721
Salary Increases	(66,199)
New Entrants	-
Active Decrements	14,067
Inactive Mortality	42,330
Contributions (More) or Less than Recommended	40,901
Increase in Amortization Payment Due to Payroll Growth Assumption	-
Change in Expected Member Contributions	(35,237)
Benefits Change	210,157
Other	<u>164,646</u>
Total Change in Contribution	416,422
(3) Contribution Determined as of January 1, 2020	\$10,144,265

STATUTORY MINIMUM REQUIRED CONTRIBUTION

Contribution requirements shown on this page are calculated according to statutory minimum funding requirements of the Illinois Pension Code. We do not believe this method is sufficient to fund future benefits; as such, we recommend funding according to the contributions developed in Section E of this report.

Valuation Date	New Benefits 1/1/2020	Old Benefits 1/1/2020	1/1/2019
Applicable to Fiscal Year Ending	<u>12/31/2021</u>	<u>12/31/2021</u>	<u>12/31/2020</u>
Actuarial Accrued Liability (PUC)	189,732,574	188,954,525	184,624,372
Actuarial Value of Assets	<u>85,683,402</u>	<u>85,683,402</u>	<u>81,390,583</u>
Unfunded Actuarial Accrued Liability (UAAL)	104,049,172	103,271,123	103,233,789
UAAL Subject to Amortization	85,075,915	84,375,671	84,771,352
Normal Cost ¹	\$3,578,806	\$3,436,844	\$3,321,387
% of Total Annual Payroll ¹	33.7	32.4	32.4
Administrative Expenses ¹	103,687	103,687	117,677
% of Total Annual Payroll ¹	1.0	1.0	1.1
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 21 years (as of 1/1/2020) ¹	5,525,108	5,479,632	5,317,922
% of Total Annual Payroll ¹	52.0	51.5	52.0
Total Required Contribution	9,207,601	9,020,163	8,756,986
% of Total Annual Payroll ¹	86.7	84.9	85.5
Expected Member Contributions ¹	1,004,135	1,004,135	968,898
% of Total Annual Payroll ¹	9.5	9.5	9.5
Expected City Contribution	8,203,466	8,016,028	7,788,088
% of Total Annual Payroll ¹	77.2	75.4	76.0
Assumptions and Methods:			
Actuarial Cost Method	Projected Unit Credit		
Amortization Method	90% Funding by 2040		
Payroll Growth Assumption	3.50%		

All other assumptions and methods are as described in the Actuarial Assumptions and Methods section.

¹ Contributions developed as of 1/1/2020 displayed above have been adjusted to account for assumed interest.

PROJECTION OF BENEFIT PAYMENTS

Year	Payments for Current Actives	Payments for Current Inactives	Total Payments
2020	290,734	9,628,767	9,919,501
2021	553,375	9,661,611	10,214,986
2022	829,132	9,744,301	10,573,433
2023	1,127,501	9,839,374	10,966,875
2024	1,453,712	9,902,587	11,356,299
2025	1,808,047	9,954,885	11,762,932
2026	2,172,516	9,995,505	12,168,021
2027	2,557,712	10,023,520	12,581,232
2028	2,989,422	10,058,381	13,047,803
2029	3,404,797	10,059,094	13,463,891
2030	3,826,790	10,063,615	13,890,405
2031	4,272,441	10,027,619	14,300,060
2032	4,748,538	9,968,133	14,716,671
2033	5,251,972	9,882,671	15,134,643
2034	5,784,439	9,768,560	15,552,999
2035	6,342,125	9,661,318	16,003,443
2036	6,918,977	9,485,302	16,404,279
2037	7,503,006	9,273,758	16,776,764
2038	8,140,892	9,026,009	17,166,901
2039	8,760,990	8,741,405	17,502,395
2040	9,402,373	8,447,898	17,850,271
2041	9,976,348	8,094,000	18,070,348
2042	10,583,595	7,708,033	18,291,628
2043	11,158,040	7,293,652	18,451,692
2044	11,772,015	6,855,453	18,627,468
2045	12,367,614	6,399,775	18,767,389
2046	12,850,928	5,932,251	18,783,179
2047	13,260,958	5,459,617	18,720,575
2048	13,643,460	4,988,535	18,631,995
2049	14,042,059	4,525,517	18,567,576
2050	14,421,582	4,076,626	18,498,208
2051	14,688,991	3,647,262	18,336,253
2052	14,903,440	3,242,039	18,145,479
2053	15,068,032	2,864,429	17,932,461
2054	15,185,642	2,516,645	17,702,287
2055	15,257,856	2,199,823	17,457,679
2056	15,280,174	1,914,077	17,194,251
2057	15,255,094	1,658,730	16,913,824
2058	15,183,663	1,432,447	16,616,110
2059	15,064,674	1,233,423	16,298,097

ACTUARIAL ASSUMPTIONS AND METHODS

Interest Rate	6.25% per year compounded annually, net of investment related expenses. This is supported by the target asset allocation of the trust and the expected long-term return by asset class.
Mortality Rate	<p><i>Active Lives:</i> PubS.H-2010 Employee mortality, projected 5 years past the valuation date with Scale MP-2019. 20% of active deaths are assumed to be in the line of duty.</p> <p><i>Inactive Lives:</i> PubS.H-2010 Healthy Retiree mortality, projected 5 years past the valuation date with Scale MP-2019.</p> <p><i>Beneficiaries:</i> PubS.H-2010 Survivor mortality, projected 5 years past the valuation date with Scale MP-2019.</p> <p><i>Disabled Lives:</i> PubS.H-2010 Disabled mortality, projected 5 years past the valuation date with Scale MP-2019.</p> <p>The mortality assumptions sufficiently accommodate anticipated future mortality improvements.</p>
Retirement Age	See table later in this section. This is based on a 2017 experience study performed for the State of Illinois Department of Insurance.
Disability Rate	See table later in this section. 80% of the disabilities are assumed to be in the line of duty. This is based on a 2017 experience study performed for the State of Illinois Department of Insurance.
Termination Rate	See table later in this section. This is based on a 2017 experience study performed for the State of Illinois Department of Insurance.
Inflation	2.50%.
Cost-of-Living Adjustment	<p><u>Tier 1:</u> 3.00% per year after age 55. Those that retire prior to age 55 receive an increase of 1/12 of 3.00% for each full month since benefit commencement upon reaching age 55.</p> <p><u>Tier 2:</u> 1.25% per year after the later of attainment of age 60 or first anniversary of retirement.</p>

Salary Increases

See table below. This is based on an experience study performed in 2017.

Age	Increase
25	7.36%
30	5.48%
35	4.53%
40	4.02%
45	3.81%
50	3.68%
55+	3.62%

Marital Status

80% of Members are assumed to be married.

Spouse's Age

Males are assumed to be three years older than females.

Funding Method

Entry Age Normal Cost Method.

Actuarial Asset Method

Investment gains and losses are smoothed over a 5-year period.

Funding Policy Amortization Method

The UAAL is amortized according to a Level Dollar method over a period ending in 2040. The initial amortization amount is 90% of the Accrued Liability less the Actuarial Value of Assets.

Payroll Growth

None.

Administrative Expenses

Expenses paid out of the fund other than investment-related expenses are assumed to be equal to those paid in the previous year.

Decrement Tables

% Terminating During the Year		% Becoming Disabled During the Year		% Retiring During the Year (Tier 1)		% Retiring During the Year (Tier 2)	
Age	Rate	Age	Rate	Age	Rate	Age	Rate
20	7.00%	20	0.010%	50-51	10%	50-54	3%
25	5.80%	25	0.016%	52-53	12%	55	30%
30	3.50%	30	0.068%	54-55	15%	56-59	20%
35	1.75%	35	0.220%	56-59	20%	60-62	25%
40	1.10%	40	0.420%	60-62	25%	63-64	33%
45	1.00%	45	0.650%	63-64	33%	65-69	50%
50	1.00%	50	0.900%	65-69	50%	70+	100%
55+	0.00%	55	1.240%	70+	100%		
		60	1.580%				

GLOSSARY

Total Annual Payroll is the projected annual rate of pay for the fiscal year following the valuation date of all covered members.

Present Value of Benefits is the single sum value on the valuation date of all future benefits to be paid to current Members, Retirees, Beneficiaries, Disability Retirees and Vested Terminations.

Normal (Current Year's) Cost is the current year's cost for benefits yet to be funded.

Unfunded Accrued Liability is a liability which arises when a pension plan is initially established or improved and such establishment or improvement is applicable to all years of past service.

Total Recommended Contribution is equal to the Normal Cost plus an amount sufficient to amortize the Unfunded Accrued Liability over a period ending in 2040. The recommended amount is adjusted for interest according to the timing of contributions during the year.

Entry Age Normal Cost Method - Under this method, the normal cost is the sum of the individual normal costs for all active participants. For an active participant, the normal cost is the participant's normal cost accrual rate, multiplied by the participant's current compensation.

- (a) The normal cost accrual rate equals:
 - (i) the present value of future benefits for the participant, determined as of the participant's entry age, divided by
 - (ii) the present value of the compensation expected to be paid to the participant for each year of the participant's anticipated future service, determined as of the participant's entry age.
- (b) In calculating the present value of future compensation, the salary scale is applied both retrospectively and prospectively to estimate compensation in years prior to and subsequent to the valuation year based on the compensation used for the valuation.
- (c) The accrued liability is the sum of the individual accrued liabilities for all participants and beneficiaries. A participant's accrued liability equals the present value, at the participant's attained age, of future benefits less the present value at the participant's attained age of the individual normal costs payable in the future. A beneficiary's accrued liability equals the present value, at the beneficiary's attained age, of future benefits. The unfunded accrued liability equals the total accrued liability less the actuarial value of assets.
- (d) Under this method, the entry age used for each active participant is the participant's age at the time he or she would have commenced participation if the plan had always been in existence under current terms, or the age as of which he or she first earns service credits for purposes of benefit accrual under the current terms of the plan.

DISCUSSION OF RISK

ASOP No. 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions, states that the actuary should identify risks that, in the actuary's professional judgment, may reasonably be anticipated to significantly affect the plan's future financial condition.

Throughout this report, actuarial results are determined under various assumption scenarios. These results are based on the premise that all future plan experience will align with the plan's actuarial assumptions; however, there is no guarantee that actual plan experience will align with the plan's assumptions. It is possible that actual plan experience will differ from anticipated experience in an unfavorable manner that will negatively impact the plan's funded position.

Below are examples of ways in which plan experience can deviate from assumptions and the potential impact of that deviation. Typically, this results in an actuarial gain or loss representing the current-year financial impact on the plan's unfunded liability of the experience differing from assumptions; this gain or loss is amortized over a period of time determined by the plan's amortization method. When assumptions are selected that adequately reflect plan experience, gains and losses typically offset one another in the long term, resulting in a relatively low impact on the plan's contribution requirements associated with plan experience. When assumptions are too optimistic, losses can accumulate over time and the plan's amortization payment could potentially grow to an unmanageable level.

- Investment Return: When the rate of return on the Actuarial Value of Assets falls short of the assumption, this produces a loss representing assumed investment earnings that were not realized. Further, it is unlikely that the plan will experience a scenario that matches the assumed return in each year as capital markets can be volatile from year to year. Therefore, contribution amounts can vary in the future.
- Salary Increases: When a plan participant experiences a salary increase that was greater than assumed, this produces a loss representing the cost of an increase in anticipated plan benefits for the participant as compared to the previous year. The total gain or loss associated with salary increases for the plan is the sum of salary gains and losses for all active participants.
- Demographic Assumptions: Actuarial results take into account various potential events that could happen to a plan participant, such as retirement, termination, disability, and death. Each of these potential events is assigned a liability based on the likelihood of the event and the financial consequence of the event for the plan. Accordingly, actuarial liabilities reflect a blend of financial consequences associated with various possible outcomes (such as retirement at one of various possible ages). Once the outcome is known (e.g. the participant retires) the liability is adjusted to reflect the known outcome. This adjustment produces a gain or loss depending on whether the outcome was more or less favorable than other outcomes that could have occurred.
- Contribution Risk: This risk results from the potential that actual employer contributions may deviate from actuarially determined contributions, which are determined in accordance with the Board's funding policy. The funding policy is intended to result in contribution requirements that if paid when due, will result in a reasonable expectation that assets will accumulate to be sufficient to pay plan benefits when due. Contribution deficits, particularly large deficits and those that occur repeatedly, increase future contribution requirements and put the plan at risk for not being able to pay plan benefits when due.

Impact of Plan Maturity on Risk

For newer pension plans, most of the participants and associated liabilities are related to active members who have not yet reached retirement age. As pension plans continue in operation and active members reach retirement ages, liabilities begin to shift from being primarily related to active members to being shared amongst active and retired members. Plan maturity is a measure of the extent to which this shift has occurred. It is important to understand that plan maturity can have an impact on risk tolerance and the overall risk characteristics of the plan. For example, plans with a large amount of retired liability do not have as long of a time horizon to recover from losses (such as losses on investments due to lower than expected investment returns) as plans where the majority of the liability is attributable to active members. For this reason, less tolerance for investment risk may be warranted for highly mature plans with a substantial inactive liability. Similarly, mature plans paying substantial retirement benefits resulting in a small positive or net negative cash flow can be more sensitive to near term investment volatility, particularly if the size of the fund is shrinking, which can result in less assets being available for investment in the market.

To assist with determining the maturity of the plan, we have provided some relevant metrics in the table following titled “Plan Maturity Measures and Other Risk Metrics”. Highlights of this information are discussed below:

- The Support Ratio, determined as the ratio of active to inactive members, has decreased from 73.6% on January 1, 2017 to 68.9% on January 1, 2020, indicating that the plan has been maturing.
- The Accrued Liability Ratio, determined as the ratio of the Inactive Accrued Liability, which is the liability associated with members who are no longer employed but are due a benefit from the plan, to the Total Accrued Liability, is 68.4%. With a plan of this maturity, losses due to lower than expected investment returns or demographic factors will need to be made up for over a shorter time horizon than would be needed for a less mature plan.
- The Funded Ratio, determined as the ratio of the Actuarial Value of Assets to the Total Accrued Liability, has stayed approximately the same from January 1, 2017 to January 1, 2020.
- The Net Cash Flow Ratio, determined as the ratio of the Net Cash Flow (contributions minus benefit payments and administrative expenses) to the Market Value of Assets, stayed approximately the same from January 1, 2017 to January 1, 2020. The current Net Cash Flow Ratio of -0.6% indicates that contributions are not currently covering the plan's benefit payments and administrative expenses.

It is important to note that the actuary has identified the risks above as the most significant risks based on the characteristics of the plan and the nature of the project, however, it is not an exhaustive list of potential risks that could be considered. Additional advanced modeling, as well as the identification of additional risks, can be provided at the request of the audience addressed on page 2 of this report.

PLAN MATURITY MEASURES AND OTHER RISK METRICS

	<u>1/1/2017</u>	<u>1/1/2018</u>	<u>1/1/2019</u>	<u>1/1/2020</u>
<u>Support Ratio</u>				
Total Actives	103	104	99	102
Total Inactives	140	139	146	148
Actives / Inactives	73.6%	74.8%	67.8%	68.9%
 <u>Asset Volatility Ratio</u>				
Market Value of Assets (MVA)	70,599,997	79,073,077	75,776,118	89,807,041
Total Annual Payroll	10,035,610	10,149,326	10,247,468	10,620,145
MVA / Total Annual Payroll	703.5%	779.1%	739.5%	845.6%
 <u>Accrued Liability (AL) Ratio</u>				
Inactive Accrued Liability	117,262,739	120,919,020	132,637,233	132,736,853
Total Accrued Liability	169,320,673	173,983,568	187,799,736	194,044,011
Inactive AL / Total AL	69.3%	69.5%	70.6%	68.4%
 <u>Funded Ratio</u>				
Actuarial Value of Assets (AVA)	73,120,605	78,282,857	81,390,583	85,683,402
Total Accrued Liability	169,320,673	173,983,568	187,799,736	194,044,011
AVA / Total Accrued Liability	43.2%	45.0%	43.3%	44.2%
 <u>Net Cash Flow Ratio</u>				
Net Cash Flow ¹	(35,856)	498,783	181,868	(501,658)
Market Value of Assets (MVA)	70,599,997	79,073,077	75,776,118	89,807,041
Ratio	-0.1%	0.6%	0.2%	-0.6%

¹ Determined as total contributions minus benefit payments and administrative expenses.

STATEMENT OF FIDUCIARY NET POSITION
December 31, 2019

<u>ASSETS</u>	MARKET VALUE
Cash and Cash Equivalents:	
Cash Equivalents	3,544,896
Total Cash and Equivalents	3,544,896
Receivables:	
From City	14,095
Accrued Past Due Interest	116,211
Total Receivable	130,306
Investments:	
Corporate Bonds	11,222,463
U.S. Gov't and Agency Obligations	18,758,990
Mutual Funds	56,150,386
Total Investments	86,131,839
Total Assets	89,807,041
 <u>LIABILITIES</u>	
Total Liabilities	0
Net Assets:	
Active and Retired Members' Equity	89,807,041
NET POSITION RESTRICTED FOR PENSIONS	89,807,041
TOTAL LIABILITIES AND NET ASSETS	89,807,041

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
 FOR THE YEAR ENDED December 31, 2019
 Market Value Basis

ADDITIONS

Contributions:

Member	954,112	
City	8,266,584	

Total Contributions 9,220,696

Investment Income:

Net Realized Gain (Loss)	789,671	
Unrealized Gain (Loss)	11,890,692	
Net Increase in Fair Value of Investments		12,680,363
Interest & Dividends		2,050,406
Less Investment Expense ¹		(203,188)

Net Investment Income 14,527,581

Total Additions 23,748,277

DEDUCTIONS

Distributions to Members:

Benefit Payments	9,624,766	
Refund of Contributions/Transfers	0	

Total Distributions 9,624,766

Administrative Expenses 97,588

Total Deductions 9,722,354

Net Increase in Net Position 14,025,923

NET POSITION RESTRICTED FOR PENSIONS

Beginning of the Year 75,781,118

End of the Year 89,807,041

¹ Investment Related expenses include investment advisory, custodial and performance monitoring fees.

ACTUARIAL ASSET VALUATION

December 31, 2019

Actuarial Assets for funding purposes are developed by recognizing the total actuarial investment gain or loss for each Plan Year over a five year period. In the first year, 20% of the gain or loss is recognized. In the second year 40%, in the third year 60%, in the fourth year 80%, and in the fifth year 100% of the gain or loss is recognized. The actuarial investment gain or loss is defined as the actual return on investments minus the actuarial assumed investment return. Actuarial Assets shall not be less than 80% nor greater than 120% of the Market Value of Assets.

Plan Year Ending	Gain/(Loss)	Gains/(Losses) Not Yet Recognized				
		Amounts Not Yet Recognized by Valuation Year				
		2020	2021	2022	2023	2024
12/31/2016	(422,241)	(84,448)	0	0	0	0
12/31/2017	3,546,209	1,418,484	709,242	0	0	0
12/31/2018	(8,426,578)	(5,055,947)	(3,370,631)	(1,685,316)	0	0
12/31/2019	9,806,938	7,845,550	5,884,163	3,922,775	1,961,388	0
Total		4,123,639	3,222,774	2,237,459	1,961,388	0

Development of Investment Gain/Loss

Market Value of Assets, 12/31/2018	75,781,118
Contributions Less Benefit Payments & Administrative Expenses	(501,658)
Expected Investment Earnings ¹	4,720,643
Actual Net Investment Earnings	<u>14,527,581</u>
2019 Actuarial Investment Gain/(Loss)	9,806,938

¹ Expected Investment Earnings = 6.25% x (75,781,118 + 0.5 x -501,658)

Development of Actuarial Value of Assets

Market Value of Assets, 12/31/2019	89,807,041
(Gains)/Losses Not Yet Recognized	<u>(4,123,639)</u>
Actuarial Value of Assets, 12/31/2019	85,683,402
(A) 12/31/2018 Actuarial Assets:	81,390,583
(I) Net Investment Income:	
1. Interest and Dividends	2,050,406
2. Realized Gains (Losses)	789,671
3. Change in Actuarial Value	2,157,588
4. Investment Expenses	<u>(203,188)</u>
Total	4,794,477
(B) 12/31/2019 Actuarial Assets:	85,683,402
Actuarial Asset Rate of Return = (2 x I) / (A + B - I):	5.91%
Market Value of Assets Rate of Return:	19.23%
12/31/2019 Limited Actuarial Assets:	85,683,402
Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis)	(276,758)

CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS
December 31, 2019
Actuarial Asset Basis

INCOME		
Contributions:		
Member	954,112	
City	8,266,584	
Total Contributions		9,220,696
Earnings from Investments		
Interest & Dividends	2,050,406	
Net Realized Gain (Loss)	789,671	
Change in Actuarial Value	2,157,588	
Total Earnings and Investment Gains		4,997,665
EXPENSES		
Administrative Expenses:		
Investment Related ¹	203,188	
Other	97,588	
Total Administrative Expenses		300,776
Distributions to Members:		
Benefit Payments	9,624,766	
Refund of Contributions/Transfers	0	
Total Distributions		9,624,766
Change in Net Assets for the Year		4,292,819
Net Assets Beginning of the Year		81,390,583
Net Assets End of the Year ²		85,683,402

¹ Investment Related expenses include investment advisory, custodial and performance monitoring fees.

² Net Assets may be limited for actuarial consideration.

STATISTICAL DATA

	<u>1/1/2017</u>	<u>1/1/2018</u>	<u>1/1/2019</u>	<u>1/1/2020</u>
<u>Actives - Tier 1</u>				
Number	76	73	68	67
Average Current Age	44.0	44.5	45.1	46.0
Average Age at Employment	28.2	28.1	28.2	28.0
Average Past Service	15.8	16.4	16.9	18.0
Average Annual Salary	\$103,029	\$104,249	\$109,606	\$112,126
<u>Actives - Tier 2</u>				
Number	27	31	31	35
Average Current Age	31.8	32.2	33.2	32.9
Average Age at Employment	28.1	27.6	27.6	27.1
Average Past Service	3.7	4.6	5.6	5.8
Average Annual Salary	\$81,683	\$81,909	\$90,138	\$88,791
<u>Service Retirees</u>				
Number	86	82	83	81
Average Current Age	69.4	69.4	69.2	69.9
Average Annual Benefit	\$70,671	\$73,049	\$76,435	\$78,877
<u>Beneficiaries</u>				
Number	30	32	39	42
Average Current Age	68.3	70.6	62.3	61.7
Average Annual Benefit	\$34,748	\$43,134	\$40,913	\$41,778
<u>Disability Retirees</u>				
Number	21	22	22	23
Average Current Age	62.8	63.1	61.3	61.2
Average Annual Benefit	\$60,835	\$62,620	\$65,582	\$66,533
<u>Terminated Vested</u>				
Number	3	3	2	2
Average Current Age	39.4	40.4	36.8	37.8
Average Annual Benefit ¹	\$46,357	\$46,357	N/A	N/A

¹ Average Annual Benefit for Terminated Vested members reflects the benefit for members entitled to a future annual benefit from the plan.

AGE AND SERVICE DISTRIBUTION

PAST SERVICE

AGE	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30+	Total
15 - 19	0	0	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0	0	0
25 - 29	5	0	2	0	0	1	0	0	0	0	0	8
30 - 34	0	0	1	0	1	11	0	0	0	0	0	13
35 - 39	0	0	1	1	0	10	16	0	0	0	0	28
40 - 44	0	0	0	0	0	2	6	7	0	0	0	15
45 - 49	0	0	0	0	0	1	3	11	3	0	0	18
50 - 54	0	0	0	0	0	0	1	4	5	1	0	11
55 - 59	0	0	0	0	0	0	0	0	0	3	4	7
60 - 64	0	0	0	0	0	0	0	0	1	0	1	2
65+	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	0	4	1	1	25	26	22	9	4	5	102

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a.	Number in prior valuation 1/1/2019	99
b.	Terminations	
i.	Vested (partial or full) with deferred benefits	0
ii.	Non-vested or full lump sum distribution received	0
iii.	Transferred service to other fund	0
c.	Deaths	
i.	Beneficiary receiving benefits	0
ii.	No future benefits payable	0
d.	Disabled	(1)
e.	Retired	<u>(1)</u>
f.	Continuing participants	97
g.	New entrants	<u>5</u>
h.	Total active life participants in valuation	102

2. Non-Active lives (including beneficiaries receiving benefits)

	Service Retirees, Vested Receiving <u>Benefits</u>	Receiving Death <u>Benefits</u>	Receiving Disability <u>Benefits</u>	Vested <u>Deferred</u>	<u>Total</u>
a. Number prior valuation	83	39	22	2	146
Retired	1	0	0	0	1
Vested Deferred	0	0	0	0	0
Death, With Survivor	(3)	3	0	0	0
Death, No Survivor	0	(2)	0	0	(2)
Disabled	0	0	1	0	1
Refund of Contributions	0	0	0	0	0
Rehires	0	0	0	0	0
Expired Annuities	0	0	0	0	0
Data Corrections	0	2	0	0	2
Hired/Termed in Same Year	0	0	0	0	0
b. Number current valuation	81	42	23	2	148

SUMMARY OF CURRENT PLAN

Article 4 Pension Fund

The Plan is established and administered as prescribed by “Article 4. Firefighters’ Pension Fund – Municipalities 500,000 and Under” of the Illinois Pension Code.

Plan Administration

The Plan is a single employer defined benefit pension plan administered by a Board of Trustees comprised of:

- a.) Two members appointed by the Municipality,
- b.) Two active Members of the Fire Department elected by the Membership, and
- c.) One retired Member of the Fire Department elected by the Membership.

Credited Service

Years and fractional parts of years of service (except as noted below) as a sworn Firefighter employed by the Municipality.

Salary

Annual salary, including longevity, attached to firefighter’s rank, as established by the municipality appropriation ordinance, excluding overtime pay, bonus pay and holiday pay except for the base 8 hours of the 10 pensionable holidays which is included.

For Tier 2 participants, the salary is capped at a rate of \$106,800 as of 2011, indexed annually at a rate of CPI-U, but not to exceed 3.00%.

Normal Retirement

Date

Tier 1: Age 50 and 20 years of Credited Service.

Tier 2: Age 55 and 10 years of Credited Service.

Benefit

Tier 1: 50% of annual salary attached to rank on last day of service plus 2.50% of annual salary for each year of service over 20 years, up to a maximum of 75% of salary. The minimum monthly benefit is \$1,159.27 per month.

Tier 2: 2.50% per year of service times the average salary for the 48 consecutive months of service within the last 60 months of service in which the total salary was the highest prior to retirement times the number of years of service, up to a maximum of 75% of average salary. The minimum monthly benefit is \$1,159.27 per month.

Form of Benefit

Tier 1: For married retirees, an annuity payable for the life of the Member; upon the death of the member, 100% of the Member’s benefit payable to the spouse until death. For unmarried retirees, the normal form is a Single Life Annuity.

Tier 2: Same as above, but with 66 2/3% of benefit continued to spouse.

Early Retirement

Date	Tier 1: Age 60 and 10 years of Credited Service. Tier 2: Age 50 and 10 years of Credited Service.
Benefit	Tier 1: 1.50% plus 0.10% for each year of service in excess of 10 years, times salary x service (complete years). Tier 2: Normal Retirement Benefit, reduced 6.00% for each year before age 55, with no minimum benefit.
Form of Benefit	Same as Normal Retirement.

Disability Benefit

Eligibility	Total and permanent as determined by the Board of Trustees. Seven years of service required for non-service connected disability.
Benefit Amount	A maximum of:

- a.) 65% of salary attached to the rank held by Member on last day of service, and;
- b.) The monthly retirement pension that the Member is entitled to receive if he or she retired immediately.

For non-service connected disabilities, a benefit of 50% of salary attached to rank held by Member on last day of service.

Cost-of-Living Adjustment

Tier 1:

Retirees: An annual increase equal to 3.00% per year after age 55. Those that retire prior to age 55 receive an increase of 1/12 of 3.00% for each full month since benefit commencement upon reaching age 55.

Disabled Retirees: An annual increase equal to 3.00% per year of the original benefit amount beginning at age 60. Those that become disabled prior to age 60 receive an increase of 3.00% of the original benefit amount for each year since benefit commencement upon reaching age 60.

Tier 2: An annual increase each January 1 equal to 3.00% per year or one-half of the annual unadjusted percentage increase in the consumer price index-u for the 12 months ending with the September preceding each November 1, whichever is less, of the original pension after the attainment of age 60 or first anniversary of pension start date whichever is later.

Pre-Retirement Death Benefit

Service Incurred	100% of salary attached to rank held by Member on last day of service.
Non-Service Incurred	A maximum of: a.) 54% of salary attached to the rank held by Member on last day of service, and; b.) The monthly retirement pension earned by the deceased Member at the time of death, regardless of whether death occurs before or after age 50.

Vesting (Termination)

Vesting Service Requirement	10 years.
Non-Vested Benefit	Refund of Member Contributions.
Vested Benefit	Either the termination benefit, payable upon reaching age 60 (55 for Tier 2), provided contributions are not withdrawn, or a refund of member contributions.
Termination Benefit	Based on the monthly salary attached to the Member's rank at separation from service and equals: Tier 1: 1.50% plus 0.10% for each year of service in excess of 10 years, times salary x service (based on complete years). Tier 2: 2.50% of 8-year final average salary times creditable service.

Contributions

Employee	9.455% of Salary.
Municipality	Remaining amount necessary for payment of Normal (current year's) Cost and amortization of the accrued past service liability.