

CITY OF EVANSTON  
FIREFIGHTERS' PENSION FUND  
ACTUARIAL VALUATION  
AS OF JANUARY 1, 2021  
CONTRIBUTIONS APPLICABLE TO THE  
PLAN/FISCAL YEAR ENDING DECEMBER 31, 2022



**FOSTER & FOSTER**  
ACTUARIES AND CONSULTANTS



August 11, 2021

Board of Trustees  
City of Evanston Firefighters' Pension Fund

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 funding 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. Use of the results for other purposes may not be applicable and could produce significantly different results.

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.

The funding percentages and unfunded accrued liability as measured based on the actuarial value of assets will differ from similar measures based on the market value of assets. These measures, as provided, are appropriate for determining the adequacy of future contributions, but may not be appropriate for the purpose of settling a portion or all of its liabilities.

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.

In performing the analysis, we used third-party software to model (calculate) the underlying liabilities and costs. These results are reviewed in the aggregate and for individual sample lives. The output from the software is either used directly or input into internally developed models to generate the costs. All internally developed models are reviewed as part of the process. As a result of this review, we believe that the models have produced reasonable results. We do not believe there are any material inconsistencies among assumptions or unreasonable output produced due to the aggregation of assumptions.

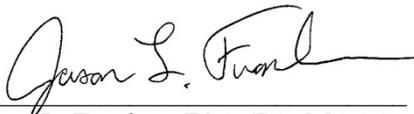
The undersigned are familiar with the immediate and long-term aspects of pension valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All of the sections of this report are considered an integral part of the 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:   
Heidi E. Andorfer, FSA, EA, MAAA

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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, 2021, 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, 2022.

The contribution requirements, compared with those set forth in the January 1, 2020 actuarial report, are as follows:

Valuation Date	1/1/2021	1/1/2020
Applicable to Fiscal Year Ending	<u>12/31/2022</u>	<u>12/31/2021</u>
Total Recommended Contribution	\$10,997,986	\$11,148,400
% of Projected Annual Payroll	110.5%	105.0%
Member Contributions (Est.)	(941,110)	(1,004,135)
% of Projected Annual Payroll	(9.5%)	(9.5%)
City Recommended Contribution	10,056,876	10,144,265
% of Projected Annual Payroll	101.0%	95.5%

As you can see, the Total Recommended Contribution shows a decrease when compared to the results determined in the January 1, 2020 actuarial valuation report. The decrease is primarily attributable to the change in active membership.

Plan experience was favorable overall on the basis of the plan's actuarial assumptions. Sources of favorable experience included an investment return of 8.94% (Actuarial Asset Basis) which exceeded the 6.25% assumption and an average salary increase of 3.44% which fell short of the 4.32% assumption. These gains were offset in part by a loss associated with more retirements than expected.

## CHANGES SINCE PRIOR VALUATION

### Plan Changes Since Prior Valuation

There were no plan changes since the prior valuation.

### Actuarial Assumption/Method Changes Since Prior Valuation

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

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	<u>1/1/2021</u>	<u>1/1/2020</u>
A. Participant Data		
Number Included		
Actives	95	102
Service Retirees	87	81
Beneficiaries	39	42
Disability Retirees	23	23
Terminated Vested	<u>2</u>	<u>2</u>
Total	246	250
Total Annual Payroll	\$9,953,574	\$10,620,145
Payroll Under Assumed Ret. Age	9,953,574	10,620,145
Annual Rate of Payments to:		
Service Retirees	7,199,098	6,389,074
Beneficiaries	1,668,576	1,754,694
Disability Retirees	1,625,981	1,530,265
Terminated Vested	0	0
B. Assets		
Actuarial Value	93,223,249	85,683,402
Market Value	101,034,113	89,807,041
C. Liabilities		
Present Value of Benefits		
Actives		
Retirement Benefits	71,252,508	79,414,860
Disability Benefits	8,566,313	8,892,391
Death Benefits	1,129,811	1,182,771
Vested Benefits	3,000,240	3,045,010
Service Retirees	106,395,594	93,168,268
Beneficiaries	15,538,126	16,219,512
Disability Retirees	24,767,831	23,282,274
Terminated Vested	<u>66,799</u>	<u>66,799</u>
Total	230,717,222	225,271,885

C. Liabilities - (Continued)	<u>1/1/2021</u>	<u>1/1/2020</u>
Present Value of Future Salaries	112,517,426	116,390,061
Present Value of Future Member Contributions	10,638,523	11,004,680
Normal Cost (Retirement)	2,224,478	2,395,645
Normal Cost (Disability)	454,840	483,698
Normal Cost (Death)	77,570	81,708
Normal Cost (Vesting)	<u>161,944</u>	<u>166,737</u>
Total Normal Cost	2,918,832	3,127,788
Present Value of Future Normal Costs	29,910,974	31,227,874
Accrued Liability (Retirement)	48,161,127	55,203,270
Accrued Liability (Disability)	3,838,234	4,036,929
Accrued Liability (Death)	264,532	298,588
Accrued Liability (Vesting)	1,774,005	1,768,371
Accrued Liability (Inactives)	<u>146,768,350</u>	<u>132,736,853</u>
Total Actuarial Accrued Liability	200,806,248	194,044,011
Unfunded Actuarial Accrued Liability (UAAL)	107,582,999	108,360,609
Funded Ratio (AVA / AL)	46.4%	44.2%

	<u>1/1/2021</u>	<u>1/1/2020</u>
D. Actuarial Present Value of Accrued Benefits		
Vested Accrued Benefits		
Inactives	146,768,350	132,736,853
Actives	16,305,004	21,515,012
Member Contributions	<u>9,726,986</u>	<u>10,540,469</u>
Total	172,800,340	164,792,334
Non-vested Accrued Benefits	<u>3,894,355</u>	<u>4,346,388</u>
Total Present Value Accrued Benefits	176,694,695	169,138,722
Funded Ratio (MVA / PVAB)	57.2%	53.1%
Increase (Decrease) in Present Value of Accrued Benefits Attributable to:		
Plan Amendments	0	
Assumption Changes	0	
Plan Experience	7,560,437	
Benefits Paid	(10,255,160)	
Interest	10,250,696	
Other	<u>0</u>	
Total	7,555,973	

Valuation Date	1/1/2021	1/1/2020
Applicable to Fiscal Year Ending	<u>12/31/2022</u>	<u>12/31/2021</u>

E. Pension Cost

Normal Cost <sup>1</sup>	\$3,101,259	\$3,323,275
% of Total Annual Payroll <sup>1</sup>	31.2	31.3
Administrative Expenses <sup>1</sup>	112,318	103,687
% of Total Annual Payroll <sup>1</sup>	1.1	1.0
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 20 years (as of 1/1/2021) <sup>1</sup>	7,784,409	7,721,438
% of Total Annual Payroll <sup>1</sup>	78.2	72.7
Total Recommended Contribution	10,997,986	11,148,400
% of Total Annual Payroll <sup>1</sup>	110.5	105.0
Expected Member Contributions <sup>1</sup>	(941,110)	(1,004,135)
% of Total Annual Payroll <sup>1</sup>	(9.5)	(9.5)
Expected City Contribution	10,056,876	10,144,265
% of Total Annual Payroll <sup>1</sup>	101.0	95.5

F. Past Contributions

Plan Years Ending:	<u>12/31/2020</u>
Total Recommended Contribution	10,713,884
City	9,727,843
Actual Contributions Made:	
Members (excluding buyback)	986,041
City	<u>9,257,515</u>
Total	10,243,556

G. Net Actuarial (Gain)/Loss (360,355)

<sup>1</sup> Contributions developed as of 1/1/2021 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</u> <sup>1</sup>
2021	87,502,374
2022	85,186,863
2023	82,726,633
2028	67,917,571
2032	52,375,821
2037	26,820,110
2041	0

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

I. (i) 5 Year Comparison of Actual and Assumed Salary Increases

		<u>Actual</u>	<u>Assumed</u>
Year Ended	12/31/2020	3.44%	4.32%
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%
Year Ended	12/31/2016	4.47%	4.34%

(ii) 5 Year Comparison of Investment Return on Actuarial Value

		<u>Actual MVA</u>	<u>Actual AVA</u>	<u>Assumed</u>
Year Ended	12/31/2020	12.64%	8.94%	6.25%
Year Ended	12/31/2019	19.23%	5.91%	6.25%
Year Ended	12/31/2018	-4.39%	3.73%	6.25%
Year Ended	12/31/2017	11.26%	6.36%	6.25%
Year Ended	12/31/2016	5.84%	5.55%	6.50%

DEVELOPMENT OF JANUARY 1, 2021 AMORTIZATION PAYMENT

(1)	Unfunded Actuarial Accrued Liability as of January 1, 2020	\$108,360,609
(2)	Sponsor Normal Cost developed as of January 1, 2020	2,123,653
(3)	Expected administrative expenses for the year ended December 31, 2020	97,588
(4)	Expected interest on (1), (2) and (3)	6,908,316
(5)	Sponsor contributions to the System during the year ended December 31, 2020	9,257,515
(6)	Expected interest on (5)	289,297
(7)	Expected Unfunded Actuarial Accrued Liability as of December 31, 2020, (1)+(2)+(3)+(4)-(5)-(6)	107,943,354
(8)	Change to UAAL due to Benefits/Assumption Change	0
(9)	Change to UAAL due to Actuarial (Gain)/Loss	(360,355)
(10)	Unfunded Accrued Liability as of January 1, 2021	107,582,999
(11)	UAAL Subject to Amortization (90% AAL less Actuarial Assets)	87,502,374

<u>Date</u> <u>Established</u>	<u>Years</u> <u>Remaining</u>	<u>1/1/2021</u> <u>Amount</u>	<u>Amortization</u> <u>Amount</u>
1/1/2021	20	87,502,374	7,326,503

## DETAILED ACTUARIAL (GAIN)/LOSS ANALYSIS

(1) Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2020	\$108,360,609
(2) Expected UAAL as of January 1, 2021	107,943,354
(3) Summary of Actuarial (Gain)/Loss, by component:	
Investment Return (Actuarial Asset Basis)	(2,305,615)
Salary Increases	(669,614)
Active Decrements	1,983,037
Inactive Mortality	477,185
Other	<u>154,652</u>
Change in UAAL due to (Gain)/Loss	(360,355)
Change to UAAL due to Benefits/Assumption Change	<u>0</u>
(4) Actual UAAL as of January 1, 2021	\$107,582,999

RECONCILIATION OF CHANGES IN CONTRIBUTION REQUIREMENT

(1) Contribution Determined as of January 1, 2020	\$ 10,144,265
(2) Summary of Contribution Impact by component:	
Change in Normal Cost	(222,016)
Change in Assumed Administrative Expense	8,631
Investment Return (Actuarial Asset Basis)	(166,828)
Salary Increases	(48,451)
New Entrants	4,608
Active Decrements	143,487
Inactive Mortality	34,528
Contributions (More) or Less than Recommended	41,717
Increase in Amortization Payment Due to Payroll Growth Assumption	-
Change in Expected Member Contributions	63,025
Benefits/Assumption Change	-
Other	53,910
Total Change in Contribution	(87,389)
(3) Contribution Determined as of January 1, 2021	\$10,056,876

## 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	1/1/2021	1/1/2020
Applicable to Fiscal Year Ending	<u>12/31/2022</u>	<u>12/31/2021</u>
Actuarial Accrued Liability (PUC)	196,510,889	189,732,574
Actuarial Value of Assets	<u>93,223,249</u>	<u>85,683,402</u>
Unfunded Actuarial Accrued Liability (UAAL)	103,287,640	104,049,172
<b>UAAL Subject to Amortization</b>	<b>83,636,551</b>	<b>85,075,915</b>
Normal Cost <sup>1</sup>	\$3,370,965	\$3,578,806
% of Total Annual Payroll <sup>1</sup>	33.9	33.7
Administrative Expenses <sup>1</sup>	112,318	103,687
% of Total Annual Payroll <sup>1</sup>	1.1	1.0
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 20 years (as of 1/1/2021) <sup>1</sup>	5,635,508	5,525,108
% of Total Annual Payroll <sup>1</sup>	56.6	52.0
Total Required Contribution	9,118,791	9,207,601
% of Total Annual Payroll <sup>1</sup>	91.6	86.7
Expected Member Contributions <sup>1</sup>	(941,110)	(1,004,135)
% of Total Annual Payroll <sup>1</sup>	(9.5)	(9.5)
Expected City Contribution	8,177,681	8,203,466
% of Total Annual Payroll <sup>1</sup>	82.1	77.2
 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.

<sup>1</sup> Contributions developed as of 1/1/2021 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
2021	195,743	10,448,735	10,644,478
2022	376,794	10,500,839	10,877,633
2023	595,227	10,632,190	11,227,417
2024	834,538	10,737,105	11,571,643
2025	1,102,379	10,835,393	11,937,772
2026	1,396,052	10,914,443	12,310,495
2027	1,713,047	10,979,521	12,692,568
2028	2,088,614	11,049,980	13,138,594
2029	2,449,139	11,084,313	13,533,452
2030	2,821,559	11,120,988	13,942,547
2031	3,223,246	11,115,090	14,338,336
2032	3,658,513	11,083,811	14,742,324
2033	4,127,764	11,024,856	15,152,620
2034	4,625,121	10,963,668	15,588,789
2035	5,152,623	10,881,333	16,033,956
2036	5,700,889	10,728,078	16,428,967
2037	6,259,227	10,537,122	16,796,349
2038	6,871,710	10,307,402	17,179,112
2039	7,470,073	10,037,970	17,508,043
2040	8,089,196	9,756,493	17,845,689
2041	8,654,021	9,410,886	18,064,907
2042	9,255,132	9,029,101	18,284,233
2043	9,824,542	8,614,379	18,438,921
2044	10,441,160	8,170,952	18,612,112
2045	11,008,523	7,704,838	18,713,361
2046	11,510,504	7,221,355	18,731,859
2047	11,933,149	6,727,005	18,660,154
2048	12,335,603	6,228,298	18,563,901
2049	12,767,458	5,731,607	18,499,065
2050	13,209,955	5,242,928	18,452,883
2051	13,522,622	4,767,692	18,290,314
2052	13,785,614	4,310,620	18,096,234
2053	14,001,976	3,875,582	17,877,558
2054	14,177,921	3,465,444	17,643,365
2055	14,313,564	3,082,229	17,395,793
2056	14,406,032	2,727,157	17,133,189
2057	14,454,983	2,400,709	16,855,692
2058	14,461,905	2,102,730	16,564,635
2059	14,423,356	1,832,585	16,255,941
2060	14,338,399	1,589,296	15,927,695

## 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><b><i>Active Lives:</i></b> PubS.H-2010 Employee mortality, projected 5 years past the valuation date with Scale MP-2020. 20% of active deaths are assumed to be in the line of duty.</p> <p><b><i>Inactive Lives:</i></b> PubS.H-2010 Healthy Retiree mortality, projected 5 years past the valuation date with Scale MP-2020.</p> <p><b><i>Beneficiaries:</i></b> PubS.H-2010 Survivor mortality, projected 5 years past the valuation date with Scale MP-2020.</p> <p><b><i>Disabled Lives:</i></b> PubS.H-2010 Disabled mortality, projected 5 years past the valuation date with Scale MP-2020.</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. 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.

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

<u>% Terminating During the Year</u>		<u>% Becoming Disabled During the Year</u>		<u>% Retiring During the Year (Tier 1)</u>		<u>% Retiring During the Year (Tier 2)</u>	
<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
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.
- Payroll Growth: The plan's payroll growth assumption, if one is used, causes a predictable annual increase in the plan's amortization payment in order to produce an amortization payment that remains constant as a percentage of payroll if all assumptions are realized. If payroll does not increase according to the plan's payroll growth assumption, the plan's amortization payment can increase significantly as a percentage of payroll even if all assumptions other than the payroll growth assumption are realized.
- 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 74.8% on January 1, 2018 to 62.9% on January 1, 2021, indicating that the plan has been rapidly 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 73.1%. 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 increased from 45.0% on January 1, 2018 to 46.4% on January 1, 2021, due mainly to plan experience.
- 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, 2018 to January 1, 2021. The current Net Cash Flow Ratio of -0.1% 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>1/1/2021</u>	<u>1/1/2020</u>	<u>1/1/2019</u>	<u>1/1/2018</u>
<u>Support Ratio</u>				
Total Actives	95	102	99	104
Total Inactives	151	148	146	139
Actives / Inactives	62.9%	68.9%	67.8%	74.8%

Asset Volatility Ratio

Market Value of Assets (MVA)	101,034,113	89,807,041	75,776,118	79,073,077
Total Annual Payroll	9,953,574	10,620,145	10,247,468	10,149,326
MVA / Total Annual Payroll	1,015.1%	845.6%	739.5%	779.1%

Accrued Liability (AL) Ratio

Inactive Accrued Liability	146,768,350	132,736,853	132,637,233	120,919,020
Total Accrued Liability	200,806,248	194,044,011	187,799,736	173,983,568
Inactive AL / Total AL	73.1%	68.4%	70.6%	69.5%

Funded Ratio

Actuarial Value of Assets (AVA)	93,223,249	85,683,402	81,390,583	78,282,857
Total Accrued Liability	200,806,248	194,044,011	187,799,736	173,983,568
AVA / Total Accrued Liability	46.4%	44.2%	43.3%	45.0%

Net Cash Flow Ratio

Net Cash Flow <sup>1</sup>	(117,315)	(501,658)	181,868	498,783
Market Value of Assets (MVA)	101,034,113	89,807,041	75,776,118	79,073,077
Ratio	-0.1%	-0.6%	0.2%	0.6%

<sup>1</sup> Determined as total contributions minus benefit payments and administrative expenses.

STATEMENT OF FIDUCIARY NET POSITION  
December 31, 2020

<u>ASSETS</u>	MARKET VALUE
Cash and Cash Equivalents:	
Checking Account	4,438
Money Market	4,540,034
Total Cash and Equivalents	4,544,472
Receivables:	
From City	16,105
Prepays	8,966
Accrued Past Due Interest	104,349
Total Receivable	129,420
Investments:	
Municipal Obligations	461,734
Corporate Bonds	10,282,510
U.S. Gov't and Agency Obligations	10,770,117
Pooled/Common/Commingled Funds	10,472,277
Mutual Funds	64,399,722
Total Investments	96,386,360
Total Assets	101,060,252
 <u>LIABILITIES</u>	
Liabilities:	
Payable:	
Accounts Payable	26,139
Total Liabilities	26,139
Net Assets:	
Active and Retired Members' Equity	101,034,113
NET POSITION RESTRICTED FOR PENSIONS	101,034,113
TOTAL LIABILITIES AND NET ASSETS	101,060,252

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION  
FOR THE YEAR ENDED December 31, 2020  
Market Value Basis

ADDITIONS

Contributions:

Member	986,041
City	9,257,515

Total Contributions 10,243,556

Investment Income:

Miscellaneous Income	16,088	
Net Realized Gain (Loss)	824,886	
Unrealized Gain (Loss)	8,171,831	
Net Increase in Fair Value of Investments		9,012,805
Interest & Dividends		2,523,318
Less Investment Expense <sup>1</sup>		(191,736)

Net Investment Income 11,344,387

Total Additions 21,587,943

DEDUCTIONS

Distributions to Members:

Benefit Payments	10,202,386
Refund of Contributions/Transfers	52,774

Total Distributions 10,255,160

Administrative Expenses 105,711

Total Deductions 10,360,871

Net Increase in Net Position 11,227,072

NET POSITION RESTRICTED FOR PENSIONS

Beginning of the Year 89,807,041

End of the Year 101,034,113

<sup>1</sup> Investment Related expenses include investment advisory, custodial and performance monitoring fees.

**ACTUARIAL ASSET VALUATION**

December 31, 2020

Development of Actuarial Value of Assets

Market Value of Assets, 12/31/2020	101,034,113
(Gains)/Losses Not Yet Recognized	(7,810,864)
Actuarial Value of Assets, 12/31/2020	<u>93,223,249</u>
12/31/2020 Limited Actuarial Assets:	93,223,249

Development of Investment Gain/Loss

Market Value of Assets, 12/31/2019	89,807,041
Contributions Less Benefit Payments & Administrative Expenses	(117,315)
Expected Investment Earnings <sup>1</sup>	5,609,274
Actual Net Investment Earnings	<u>11,344,387</u>
2020 Actuarial Investment Gain/(Loss)	5,735,113

<sup>1</sup> Expected Investment Earnings = 6.25% x (89,807,041 + 0.5 x -117,315)

Gains/(Losses) Not Yet Recognized

Plan Year Ending	Gain/(Loss)	Amounts Not Yet Recognized by Valuation Year				
		2021	2022	2023	2024	2025
12/31/2017	3,546,209	709,242	0	0	0	0
12/31/2018	(8,426,578)	(3,370,631)	(1,685,316)	0	0	0
12/31/2019	9,806,938	5,884,163	3,922,775	1,961,388	0	0
12/31/2020	5,735,113	4,588,090	3,441,068	2,294,045	1,147,023	0
Total		<u>7,810,864</u>	5,678,527	4,255,433	1,147,023	0

Development of Asset Returns

(A) 12/31/2019 Actuarial Assets:	85,683,402
(I) Net Investment Income:	
1. Interest and Dividends	2,539,406
2. Realized Gains (Losses)	824,886
3. Change in Actuarial Value	4,484,606
4. Investment Expenses	<u>(191,736)</u>
Total	7,657,162
(B) 12/31/2020 Actuarial Assets:	93,223,249
Actuarial Asset Rate of Return = (2 x I) / (A + B - I):	8.94%
Market Value of Assets Rate of Return:	12.64%
Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis)	2,305,615

CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS  
December 31, 2020  
Actuarial Asset Basis

INCOME		
Contributions:		
Member	986,041	
City	9,257,515	
Total Contributions		10,243,556
Earnings from Investments		
Interest & Dividends	2,523,318	
Miscellaneous Income	16,088	
Net Realized Gain (Loss)	824,886	
Change in Actuarial Value	4,484,606	
Total Earnings and Investment Gains		7,848,898
EXPENSES		
Administrative Expenses:		
Investment Related <sup>1</sup>	191,736	
Other	105,711	
Total Administrative Expenses		297,447
Distributions to Members:		
Benefit Payments	10,202,386	
Refund of Contributions/Transfers	52,774	
Total Distributions		10,255,160
Change in Net Assets for the Year		7,539,847
Net Assets Beginning of the Year		85,683,402
Net Assets End of the Year <sup>2</sup>		93,223,249

<sup>1</sup> Investment Related expenses include investment advisory, custodial and performance monitoring fees.

<sup>2</sup> Net Assets may be limited for actuarial consideration.

## STATISTICAL DATA

	<u>1/1/2021</u>	<u>1/1/2020</u>	<u>1/1/2019</u>	<u>1/1/2018</u>
<u>Actives - Tier 1</u>				
Number	59	67	68	73
Average Current Age	45.5	46.0	45.1	44.5
Average Age at Employment	28.4	28.0	28.2	28.1
Average Past Service	17.1	18.0	16.9	16.4
Average Annual Salary	\$112,882	\$112,126	\$109,606	\$104,249
<u>Actives - Tier 2</u>				
Number	36	35	31	31
Average Current Age	33.7	32.9	33.2	32.2
Average Age at Employment	27.3	27.1	27.6	27.6
Average Past Service	6.4	5.8	5.6	4.6
Average Annual Salary	\$91,487	\$88,791	\$90,138	\$81,909
<u>Service Retirees</u>				
Number	87	81	83	82
Average Current Age	69.1	69.9	69.2	69.4
Average Annual Benefit	\$82,748	\$78,877	\$76,435	\$73,049
<u>Beneficiaries</u>				
Number	39	42	39	32
Average Current Age	60.0	61.7	62.3	70.6
Average Annual Benefit	\$42,784	\$41,778	\$40,913	\$43,134
<u>Disability Retirees</u>				
Number	23	23	22	22
Average Current Age	60.6	61.2	61.3	63.1
Average Annual Benefit	\$70,695	\$66,533	\$65,582	\$62,620
<u>Terminated Vested</u>				
Number	2	2	2	3
Average Current Age	38.8	37.8	36.8	40.4
Average Annual Benefit <sup>1</sup>	N/A	N/A	N/A	\$46,357

<sup>1</sup> 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	1	5	0	2	0	0	0	0	0	0	0	8
30 - 34	1	0	0	1	0	11	0	0	0	0	0	13
35 - 39	1	0	0	1	1	9	15	0	0	0	0	27
40 - 44	0	0	0	0	0	2	6	4	1	0	0	13
45 - 49	0	0	0	0	0	2	3	9	4	0	0	18
50 - 54	0	0	0	0	0	0	1	5	5	0	0	11
55 - 59	0	0	0	0	0	0	0	1	1	1	1	4
60 - 64	0	0	0	0	0	0	0	0	0	0	1	1
65+	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	5	0	4	1	24	25	19	11	1	2	95

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 1/1/2020	102
b. Terminations	
i. Vested (partial or full) with deferred benefits	0
ii. Non-vested or full lump sum distribution received	(1)
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>(8)</u>
f. Continuing participants	92
g. New entrants	<u>3</u>
h. Total active life participants in valuation	95

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	81	42	23	2	148
Retired	8	0	0	0	8
Vested Deferred	0	0	0	0	0
Death, With Survivor	(1)	1	0	0	0
Death, No Survivor	(1)	(4)	(1)	0	(6)
Disabled	0	1	1	0	2
Refund of Contributions	0	(1)	0	0	(1)
Rehires	0	0	0	0	0
Expired Annuities	0	0	0	0	0
Data Corrections	0	0	0	0	0
Hired/Termed in Same Year	0	0	0	0	0
b. Number current valuation	87	39	23	2	151

## 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	<b>Tier 1:</b> Age 60 and 10 years of Credited Service. <b>Tier 2:</b> Age 50 and 10 years of Credited Service.
Benefit	<b>Tier 1:</b> 1.50% plus 0.10% for each year of service in excess of 10 years, times salary x service (complete years). <b>Tier 2:</b> 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:  <b>Tier 1:</b> 1.50% plus 0.10% for each year of service in excess of 10 years, times salary x service (based on complete years).  <b>Tier 2:</b> 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.