CITY OF ROCHELLE
FIREFIGHTERS' PENSION FUND

ACTUARIAL VALUATION
AS OF JANUARY 1, 2022

CONTRIBUTIONS APPLICABLE TO THE
PLAN/FISCAL YEAR ENDING DECEMBER 31, 2023

FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

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August 19, 2022

Board of Trustees
City of Rochelle Firefighters' Pension Fund

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

Dear Board:

We are pleased to present to the Board this report of the annual actuarial valuation of the City of Rochelle 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.

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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 Rochelle, nor does anyone at Foster & Foster, Inc. act as a member of the Board of Trustees of the City of Rochelle 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
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By: Heidi Andorfer
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 Rochelle Firefighters' Pension Fund, performed as of January 1, 2022, 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, 2023.

The contribution requirements, compared with those set forth in the January 1, 2021 actuarial report, are as follows:

Valuation Date Applicable to Fiscal Year Ending	1/1/2022 12/31/2023	1/1/2021 12/31/2022
Total Recommended Contribution	$633,907	$709,555
% of Projected Annual Payroll	49.9%	61.3%
Member Contributions (Est.)	(120,218)	(109,492)
% of Projected Annual Payroll	(9.5%)	(9.5%)
City Recommended Contribution	513,689	600,063
% of Projected Annual Payroll	40.4%	51.8%

As you can see, the Total Recommended Contribution shows a decrease when compared to the results determined in the January 1, 2021 actuarial valuation report. The decrease is attributable to favorable plan experience. The decrease was offset in part by an increase in active membership and the natural increase in the amortization payment due to the payroll growth assumption.

Plan experience was favorable overall on the basis of the plan's actuarial assumptions. Sources of favorable experience included higher than expected inactive mortality and an investment return of 9.94% (Actuarial Asset Basis) which exceeded the 6.50% assumption. There were no significant sources of unfavorable experience.

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

Based on the results of the 2021 experience study performed for the Illinois Firefighters' Pension Investment Fund, the following assumption changes were made:

- Updated mortality, retirement, and termination rate tables.
- Updated assumed salary increase rates.
- Reduced assumed payroll growth rate from 3.50% to 3.25%.

In addition, the interest rate was increased from 6.50% to 6.75% to reflect the movement to the new investment portfolio under the Illinois Firefighters' Pension Investment Fund.

There were no method changes since the prior valuation.

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	New Assump 1/1/2022	Old Assump 1/1/2022	1/1/2021
A. Participant Data			
Number Included			
Actives	14	14	13
Service Retirees	8	8	9
Beneficiaries	0	0	0
Disability Retirees	1	1	1
Terminated Vested	1	1	1
Total	24	24	24
Total Annual Payroll	$1,271,476	$1,271,476	$1,158,036
Payroll Under Assumed Ret. Age	1,271,476	1,271,476	1,158,036
Annual Rate of Payments to:			
Service Retirees	570,276	570,276	626,460
Beneficiaries	0	0	0
Disability Retirees	34,090	34,090	33,592
Terminated Vested	0	0	0
B. Assets			
Actuarial Value	11,393,962	11,393,962	10,244,594
Market Value	12,355,121	12,355,121	11,071,799
C. Liabilities			
Present Value of Benefits			
Actives			
Retirement Benefits	8,307,043	8,290,958	7,595,598
Disability Benefits	989,155	1,056,257	957,011
Death Benefits	121,692	136,197	127,372
Vested Benefits	426,272	422,325	429,100
Service Retirees	8,392,290	8,641,435	9,639,920
Beneficiaries	0	0	0
Disability Retirees	332,765	350,502	355,377
Terminated Vested	37,425	37,425	37,425
Total	18,606,642	18,935,099	19,141,803

C. Liabilities - (Continued)	New Assump 1/1/2022	Old Assump 1/1/2022	1/1/2021
Present Value of Future Salaries	15,224,678	15,745,178	14,546,942
Present Value of Future Member Contributions	1,439,493	1,488,707	1,375,413
Normal Cost (Retirement)	246,087	250,285	229,816
Normal Cost (Disability)	42,523	45,430	40,763
Normal Cost (Death)	7,200	8,313	7,690
Normal Cost (Vesting)	21,619	20,760	21,037
Total Normal Cost	317,429	324,788	299,306
Present Value of Future Normal Costs	3,510,476	3,725,914	3,502,006
Accrued Liability (Retirement)	5,583,019	5,421,491	4,900,434
Accrued Liability (Disability)	456,833	470,794	418,764
Accrued Liability (Death)	35,166	33,233	30,708
Accrued Liability (Vesting)	258,668	254,305	257,169
Accrued Liability (Inactives)	8,762,480	9,029,362	10,032,722
Total Actuarial Accrued Liability	15,096,166	15,209,185	15,639,797
Unfunded Actuarial Accrued Liability (UAAL)	3,702,204	3,815,223	5,395,203
Funded Ratio (AVA / AL)	75.5%	74.9%	65.5%

	New Assump 1/1/2022	Old Assump 1/1/2022	1/1/2021
D. Actuarial Present Value of Accrued Benefits			
Vested Accrued Benefits			
Inactives	8,762,480	9,029,362	10,032,722
Actives	1,997,273	2,051,878	1,558,320
Member Contributions	1,121,531	1,121,531	1,010,151
Total	11,881,284	12,202,771	12,601,193
Non-vested Accrued Benefits	281,883	270,959	352,661
Total Present Value Accrued Benefits	12,163,167	12,473,730	12,953,854
Funded Ratio (MVA / PVAB)	101.6%	99.0%	85.5%
Increase (Decrease) in Present Value of Accrued Benefits Attributable to:			
Plan Amendments	0	0	
Assumption Changes	(310,564)	0	
Plan Experience	0	(675,107)	
Benefits Paid	0	(626,651)	
Interest	0	821,634	
Other	0	0	
Total	(310,564)	(480,124)	

Valuation Date Applicable to Fiscal Year Ending	New Assump 1/1/2022 12/31/2023	Old Assump 1/1/2022 12/31/2023	1/1/2021 12/31/2022
E. Pension Cost			
Normal Cost [1]	$338,855	$345,899	$318,761
% of Total Annual Payroll [1]	26.7	27.2	27.5
Administrative Expenses [1]	18,893	18,848	18,971
% of Total Annual Payroll [1]	1.5	1.5	1.7
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 19 years (as of 1/1/2022) [1]	276,159	273,208	371,823
% of Total Annual Payroll [1]	21.7	21.5	32.1
Total Recommended Contribution	633,907	637,955	709,555
% of Total Annual Payroll [1]	49.9	50.2	61.3
Expected Member Contributions [1]	(120,218)	(120,218)	(109,492)
% of Total Annual Payroll [1]	(9.5)	(9.5)	(9.5)
Expected City Contribution	513,689	517,737	600,063
% of Total Annual Payroll [1]	40.4	40.7	51.8
F. Past Contributions			
Plan Years Ending:	12/31/2021		
Total Recommended Contribution	691,957		
City	580,578		
Actual Contributions Made:			
Members (excluding buyback)	111,379		
City	658,021		
Total	769,400		
G. Net Actuarial (Gain)/Loss	(1,471,805)		

[1] Contributions developed as of 1/1/2022 displayed above have been adjusted to account for assumed interest.

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

Year	Projected Unfunded Accrued Liability
2022	3,702,204
2023	3,675,944
2024	3,638,936
2028	3,361,877
2033	2,625,830
2037	1,591,438
2041	0

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

		Actual	Assumed
Year Ended	12/31/2021	4.72%	5.00%
Year Ended	12/31/2020	7.33%	5.18%
Year Ended	12/31/2019	5.94%	5.14%
Year Ended	12/31/2018	6.79%	4.97%
Year Ended	12/31/2017	3.57%	6.05%

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

		Actual MVA	Actual AVA	Assumed
Year Ended	12/31/2021	10.40%	9.94%	6.50%
Year Ended	12/31/2020	14.70%	8.42%	6.50%
Year Ended	12/31/2019	15.48%	5.45%	6.50%
Year Ended	12/31/2018	-2.83%	4.21%	6.50%
Year Ended	12/31/2017	10.74%	5.41%	6.50%

DEVELOPMENT OF JANUARY 1, 2022 AMORTIZATION PAYMENT

(1)	Unfunded Actuarial Accrued Liability as of January 1, 2021	$5,395,203
(2)	Sponsor Normal Cost developed as of January 1, 2021	189,814
(3)	Expected administrative expenses for the year ended December 31, 2021	17,813
(4)	Expected interest on (1), (2) and (3)	363,605
(5)	Sponsor contributions to the System during the year ended December 31, 2021	658,021
(6)	Expected interest on (5)	21,386
(7)	Expected Unfunded Actuarial Accrued Liability as of December 31, 2021, (1)+(2)+(3)+(4)-(5)-(6)	5,287,028
(8)	Change to UAAL due to Assumption Change	(113,019)
(9)	Change to UAAL due to Actuarial (Gain)/Loss	(1,471,805)
(10)	Unfunded Accrued Liability as of January 1, 2022	3,702,204
(11)	UAAL Subject to Amortization (100% AAL less Actuarial Assets)	3,702,204

Date Established	Years Remaining	1/1/2022 Amount	Amortization Amount
1/1/2022	19	3,702,204	258,697

DETAILED ACTUARIAL (GAIN)/LOSS ANALYSIS

(1) Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2021	$5,395,203
(2) Expected UAAL as of January 1, 2022	5,287,028
(3) Summary of Actuarial (Gain)/Loss, by component:	
Investment Return (Actuarial Asset Basis)	(354,354)
Salary Increases	(34,240)
Active Decrements	(61,131)
Inactive Mortality	(1,039,039)
Other	16,959
Change in UAAL due to (Gain)/Loss	(1,471,805)
Change to UAAL due to Assumption Change	(113,019)
(4) Actual UAAL as of January 1, 2022	$3,702,204

RECONCILIATION OF CHANGES IN CONTRIBUTION REQUIREMENT

(1) Contribution Determined as of January 1, 2021	$	600,063
(2) Summary of Contribution Impact by component:		
Change in Normal Cost		27,138
Change in Assumed Administrative Expense		(123)
Investment Return (Actuarial Asset Basis)		(25,375)
Salary Increases		(2,452)
New Entrants		859
Active Decrements		(4,378)
Inactive Mortality		(74,405)
Contributions (More) or Less than Recommended		(5,726)
Increase in Amortization Payment Due to Payroll Growth Assumption		13,014
Change in Expected Member Contributions		(10,726)
Assumption Change		(4,048)
Other		(152)
Total Change in Contribution		(86,374)
(3) Contribution Determined as of January 1, 2022		$513,689

PROJECTION OF BENEFIT PAYMENTS

Year	Payments for Current Actives	Payments for Current Inactives	Total Payments
2022	18,121	637,557	655,678
2023	44,850	615,024	659,874
2024	70,922	629,668	700,590
2025	94,412	643,964	738,376
2026	125,723	657,791	783,514
2027	156,348	671,009	827,357
2028	182,849	683,459	866,308
2029	214,978	694,957	909,935
2030	252,148	705,295	957,443
2031	293,930	714,240	1,008,170
2032	331,571	721,532	1,053,103
2033	384,825	726,892	1,111,717
2034	450,353	730,014	1,180,367
2035	514,845	730,589	1,245,434
2036	582,335	728,311	1,310,646
2037	652,698	722,872	1,375,570
2038	729,437	713,988	1,443,425
2039	812,146	701,411	1,513,557
2040	887,745	684,938	1,572,683
2041	955,086	664,407	1,619,493
2042	1,056,571	639,729	1,696,300
2043	1,159,897	610,973	1,770,870
2044	1,255,588	578,452	1,834,040
2045	1,338,621	542,679	1,881,300
2046	1,434,714	504,330	1,939,044
2047	1,517,772	464,173	1,981,945
2048	1,606,748	422,971	2,029,719
2049	1,684,926	381,456	2,066,382
2050	1,749,356	340,312	2,089,668
2051	1,819,658	300,185	2,119,843
2052	1,882,109	261,685	2,143,794
2053	1,932,167	225,362	2,157,529
2054	1,975,518	191,676	2,167,194
2055	2,011,676	160,959	2,172,635
2056	2,043,036	133,390	2,176,426
2057	2,071,237	109,022	2,180,259
2058	2,094,198	87,796	2,181,994
2059	2,113,988	69,575	2,183,563
2060	2,130,015	54,175	2,184,190
2061	2,143,119	41,379	2,184,498

ACTUARIAL ASSUMPTIONS AND METHODS

Interest Rate	6.75% 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	***Active Lives:*** PubS-2010 Employee mortality, unadjusted, with generational improvements with the most recent projection scale (currently Scale MP-2021). 20% of active deaths are assumed to be in the line of duty. ***Inactive Lives:*** PubS-2010 Healthy Retiree mortality, adjusted by a factor of 1.081 for male retirees and unadjusted for female retirees, with generational improvements with the most recent projection scale (currently Scale MP-2021). ***Beneficiaries:*** PubS-2010 Survivor mortality, unadjusted for male beneficiaries and adjusted by a factor of 1.098 for female beneficiaries, with generational improvements with the most recent projection scale (currently Scale MP-2021). ***Disabled Lives:*** PubS-2010 Disabled mortality, adjusted by a factor of 1.178 for male disabled members and unadjusted for female disabled members, with generational improvements with the most recent projection scale (currently Scale MP-2021). The mortality assumptions sufficiently accommodate anticipated future mortality improvements.
Retirement Age	See table later in this section. This is based on a 2021 experience study performed for the Illinois Firefighters' Pension Investment Fund.
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 2021 experience study performed for the Illinois Firefighters' Pension Investment Fund.
Termination Rate	See table later in this section. This is based on a 2021 experience study performed for the Illinois Firefighters' Pension Investment Fund.
Inflation	2.50%.

Cost-of-Living Adjustment

Tier 1: 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.

Tier 2: 1.25% per year after the later of attainment of age 60 or first anniversary of retirement.

Salary Increases

See table below, inclusive of inflation of 2.50%. This is based on a 2021 experience study performed for the Illinois Firefighters' Pension Investment Fund.

Salary Scale

Service	Rate
0	12.78%
1	10.77%
2	9.77%
3	8.77%
4	7.76%
5	6.76%
6	5.26%
7	4.76%
8+	4.25%

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 Percentage of Payroll method over a period ending in 2040. The initial amortization amount is 100% of the Accrued Liability less the Actuarial Value of Assets.

Payroll Growth

3.25% per year.

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	
Age	Rate
20	10.00%
25	8.00%
30	4.00%
35	2.50%
40	1.20%
45+	1.00%

% Becoming Disabled During the Year	
Age	Rate
20	0.010%
25	0.016%
30	0.068%
35	0.220%
40	0.420%
45	0.650%
50	0.900%
55	1.240%
60	1.580%

% Retiring During the Year (Tier 1)	
Age	Rate
50-51	12%
52-53	15%
54-55	20%
56-59	20%
60-62	25%
63-64	33%
65-69	50%
70+	100%

% Retiring During the Year (Tier 2)	
Age	Rate
50-54	3%
55	30%
56-59	20%
60-62	25%
63-64	33%
65-69	50%
70+	100%

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.

- <u>Investment Return</u>: 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.

- <u>Salary Increases</u>: 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.

- <u>Payroll Growth</u>: 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.

- <u>Demographic Assumptions:</u> 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 increased from 108.3% on January 1, 2019 to 140.0% on January 1, 2022, indicating that the plan has experienced a significant growth in active population.

- 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 58.0%. With a plan of this maturity, losses due to lower than expected investment returns or demographic factors can be made up over a longer time horizon than would be needed for a more mature plan.

- The Funded Ratio, determined as the ratio of the Actuarial Value of Assets to the Total Accrued Liability, has increased from 60.9% on January 1, 2019 to 75.5% on January 1, 2022, due mainly to favorable 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, increased from -2.3% on January 1, 2019 to 1.0% on January 1, 2022. The current Net Cash Flow Ratio of 1.0% indicates that contributions are generally 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

	1/1/2022	1/1/2021	1/1/2020	1/1/2019
Support Ratio				
Total Actives	14	13	13	13
Total Inactives	10	11	11	12
Actives / Inactives	140.0%	118.2%	118.2%	108.3%
Asset Volatility Ratio				
Market Value of Assets (MVA)	12,355,121	11,071,799	9,685,438	8,495,037
Total Annual Payroll	1,271,476	1,158,036	1,078,934	1,018,430
MVA / Total Annual Payroll	971.7%	956.1%	897.7%	834.1%
Accrued Liability (AL) Ratio				
Inactive Accrued Liability	8,762,480	10,032,722	9,972,405	10,719,243
Total Accrued Liability	15,096,166	15,639,797	14,840,227	14,960,172
Inactive AL / Total AL	58.0%	64.1%	67.2%	71.7%
Funded Ratio				
Actuarial Value of Assets (AVA)	11,393,962	10,244,594	9,482,192	9,104,647
Total Accrued Liability	15,096,166	15,639,797	14,840,227	14,960,172
AVA / Total Accrued Liability	75.5%	65.5%	63.9%	60.9%
Net Cash Flow Ratio				
Net Cash Flow [1]	125,051	(34,674)	(115,610)	(192,787)
Market Value of Assets (MVA)	12,355,121	11,071,799	9,685,438	8,495,037
Ratio	1.0%	-0.3%	-1.2%	-2.3%

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

STATEMENT OF FIDUCIARY NET POSITION
December 31, 2021

	MARKET VALUE
<u>ASSETS</u>	
Cash and Cash Equivalents:	
Cash and Short-Term Investments	518,121
Total Cash and Equivalents	518,121
Receivables:	
Accrued Past Due Interest	26,441
Total Receivable	26,441
Investments:	
Municipal Obligations	722,056
Corporate Bonds	741,139
U.S. Gov't and Agency Obligations	3,203,375
Insurance Company Contracts	205,144
Stocks	220,904
Mutual Funds	6,717,941
Total Investments	11,810,559
Total Assets	12,355,121
<u>LIABILITIES</u>	
Total Liabilities	0
Net Assets:	
Active and Retired Members' Equity	12,355,121
NET POSITION RESTRICTED FOR PENSIONS	12,355,121
TOTAL LIABILITIES AND NET ASSETS	12,355,121

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
FOR THE YEAR ENDED December 31, 2021
Market Value Basis

<u>ADDITIONS</u>		
Contributions:		
Member	111,379	
City	658,021	
Total Contributions		769,400
Investment Income:		
Net Increase in Fair Value of Investments		679,314
Interest & Dividends		510,209
Less Investment Expense [1]		(31,252)
Net Investment Income		1,158,271
Total Additions		1,927,671
<u>DEDUCTIONS</u>		
Distributions to Members:		
Benefit Payments	626,651	
Total Distributions		626,651
Administrative Expenses		17,698
Total Deductions		644,349
Net Increase in Net Position		1,283,322
NET POSITION RESTRICTED FOR PENSIONS		
Beginning of the Year		11,071,799
End of the Year		12,355,121

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

ACTUARIAL ASSET VALUATION
December 31, 2021

Development of Actuarial Value of Assets

Market Value of Assets, 12/31/2021	12,355,121
(Gains)/Losses Not Yet Recognized	(961,159)
Actuarial Value of Assets, 12/31/2021	11,393,962
12/31/2021 Limited Actuarial Assets:	11,393,962

Development of Investment Gain/Loss

Market Value of Assets, 12/31/2020	11,071,799
Contributions Less Benefit Payments & Administrative Expenses	125,051
Expected Investment Earnings[1]	723,731
Actual Net Investment Earnings	1,158,271
2021 Actuarial Investment Gain/(Loss)	434,540

[1] Expected Investment Earnings = 6.50% x (11,071,799 + 0.5 x 125,051)

Gains/(Losses) Not Yet Recognized

Plan Year		Amounts Not Yet Recognized by Valuation Year				
Ending	Gain/(Loss)	2021	2022	2023	2024	2025
12/31/2018	(825,371)	(165,074)	0	0	0	0
12/31/2019	757,591	303,036	151,518	0	0	0
12/31/2020	792,608	475,565	317,043	158,522	0	0
12/31/2021	434,540	347,632	260,724	173,816	86,908	0
Total		961,159	729,285	332,338	86,908	0

Development of Asset Returns

(A) 12/31/2020 Actuarial Assets:	10,244,594
(I) Net Investment Income:	
1. Interest and Dividends	510,209
2. Realized Gains (Losses)	0
3. Change in Actuarial Value	545,360
4. Investment Expenses	(31,252)
Total	1,024,317
(B) 12/31/2021 Actuarial Assets:	11,393,962
Actuarial Asset Rate of Return = (2 x I) / (A + B - I):	9.94%
Market Value of Assets Rate of Return:	10.40%
Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis)	354,354

CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS
December 31, 2021
Actuarial Asset Basis

INCOME		
Contributions:		
Member	111,379	
City	658,021	
Total Contributions		769,400
Earnings from Investments		
Interest & Dividends	510,209	
Change in Actuarial Value	545,360	
Total Earnings and Investment Gains		1,055,569
EXPENSES		
Administrative Expenses:		
Investment Related[1]	31,252	
Other	17,698	
Total Administrative Expenses		48,950
Distributions to Members:		
Benefit Payments	626,651	
Total Distributions		626,651
Change in Net Assets for the Year		1,149,368
Net Assets Beginning of the Year		10,244,594
Net Assets End of the Year[2]		11,393,962

[1] Investment Related expenses include investment advisory, custodial and performance monitoring fees.
[2] Net Assets may be limited for actuarial consideration.

STATISTICAL DATA

	1/1/2022	1/1/2021	1/1/2020	1/1/2019
Actives - Tier 1				
Number	7	7	7	7
Average Current Age	45.1	44.1	43.1	42.1
Average Age at Employment	25.8	25.8	25.8	25.8
Average Past Service	19.3	18.3	17.3	16.3
Average Annual Salary	$102,653	$99,765	$95,938	$90,824
Actives - Tier 2				
Number	7	6	6	6
Average Current Age	32.3	32.4	30.4	29.4
Average Age at Employment	26.4	26.5	25.5	25.6
Average Past Service	5.9	5.9	4.9	3.8
Average Annual Salary	$78,986	$76,614	$67,894	$63,777
Service Retirees				
Number	8	9	9	10
Average Current Age	68.2	67.4	66.4	66.3
Average Annual Benefit	$71,285	$69,607	$67,473	$65,174
Beneficiaries				
Number	0	0	0	0
Average Current Age	N/A	N/A	N/A	N/A
Average Annual Benefit	N/A	N/A	N/A	N/A
Disability Retirees				
Number	1	1	1	1
Average Current Age	77.2	76.2	75.2	74.2
Average Annual Benefit	$34,090	$33,592	$33,093	$32,594
Terminated Vested				
Number	1	1	1	1
Average Current Age	43.7	42.7	41.7	40.7
Average Annual Benefit [1]	N/A	N/A	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	1	0	0	1	0	0	0	0	0	0	0	2
30 - 34	0	0	0	1	0	1	0	0	0	0	0	2
35 - 39	0	0	0	0	0	2	1	3	0	0	0	6
40 - 44	0	0	0	0	0	0	0	0	0	0	0	0
45 - 49	0	0	0	0	0	0	1	1	1	0	0	3
50 - 54	0	0	0	0	0	0	0	0	0	0	0	0
55 - 59	0	0	0	0	0	0	0	0	0	0	0	0
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	1	0	0	2	0	3	2	4	1	0	1	14

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 1/1/2021	13
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	0
e. Retired	0
f. Continuing participants	13
g. New entrants	1
h. Total active life participants in valuation	14

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

	Service Retirees, Vested Receiving Benefits	Receiving Death Benefits	Receiving Disability Benefits	Vested Deferred	Total
a. Number prior valuation	9	0	1	1	11
Retired	0	0	0	0	0
Vested Deferred	0	0	0	0	0
Death, With Survivor	0	0	0	0	0
Death, No Survivor	(1)	0	0	0	(1)
Disabled	0	0	0	0	0
Refund of Contributions	0	0	0	0	0
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	8	0	1	1	10

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 4-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.