CITY OF ROCHELLE
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

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August 5, 2020

Board of Trustees
c/o Ms. Chris Cardott, Finance Director / Treasurer
City of Rochelle
420 N. 6th Street
Rochelle, IL 61068

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 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 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, FSA, EA, MAAA

By: ______________________
Heidi E. Andorfer, FSA, EA, MAAA

By: ______________________
Paul M. Baugher, FSA, EA, MAAA

JLF/lke
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, 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	1/1/2020	1/1/2019
Applicable to Fiscal Year Ending	12/31/2021	12/31/2020
Total Recommended Contribution	$682,591	$680,047
% of Projected Annual Payroll	63.2%	66.8%
Member Contributions (Est.)	102,013	96,293
% of Projected Annual Payroll	9.5%	9.5%
City Recommended Contribution	580,578	583,754
% of Projected Annual Payroll	53.7%	57.3%

As you can see, the City Recommended Contribution shows a decrease when compared to the results determined in the January 1, 2019 actuarial valuation report. The decrease is attributable to experience gains. The decrease was offset in part by Tier 2 benefit changes.

The Plan experienced gains on the basis of the plan's actuarial assumptions. The Plan experienced higher than expected inactive mortality and fewer retirements than expected. These gains were offset in part by losses associated with an investment return of 5.45% (Actuarial Asset Basis) which fell short of the 6.50% assumption and an average salary increase of 5.94% which exceeded the 5.14% assumption.

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 1/1/2020	Old Benefits 1/1/2020	1/1/2019
A. Participant Data			
Number Included			
Actives	13	13	13
Service Retirees	9	9	10
Beneficiaries	0	0	0
Disability Retirees	1	1	1
Terminated Vested	1	1	1
Total	24	24	25
Total Annual Payroll	$1,078,934	$1,078,934	$1,018,430
Payroll Under Assumed Ret. Age	1,078,934	1,078,934	1,018,430
Annual Rate of Payments to:			
Service Retirees	607,258	607,258	651,735
Beneficiaries	0	0	0
Disability Retirees	33,093	33,093	32,594
Terminated Vested	0	0	0
B. Assets			
Actuarial Value	9,482,192	9,482,192	9,104,647
Market Value	9,685,438	9,685,438	8,495,037
C. Liabilities			
Present Value of Benefits			
Actives			
Retirement Benefits	6,915,791	6,656,423	6,112,099
Disability Benefits	895,338	876,992	834,863
Death Benefits	117,674	98,840	86,449
Vested Benefits	411,520	405,140	371,207
Service Retirees	9,573,236	9,573,236	10,313,888
Beneficiaries	0	0	0
Disability Retirees	361,744	361,744	367,930
Terminated Vested	37,425	37,425	37,425
Total	18,312,728	18,009,800	18,123,861

C. Liabilities - (Continued)	New Benefits 1/1/2020	Old Benefits 1/1/2020	1/1/2019
Present Value of Future Salaries	13,948,739	13,742,872	13,596,739
Present Value of Future Member Contributions	1,318,853	1,299,389	1,285,572
Normal Cost (Retirement)	220,700	209,717	197,427
Normal Cost (Disability)	43,888	43,323	40,674
Normal Cost (Death)	7,128	6,071	5,073
Normal Cost (Vesting)	22,197	21,893	20,439
Total Normal Cost	293,913	281,004	263,613
Present Value of Future Normal Costs	3,472,501	3,225,822	3,163,689
Accrued Liability (Retirement)	4,252,402	4,199,774	3,701,177
Accrued Liability (Disability)	367,492	364,995	329,559
Accrued Liability (Death)	25,698	26,240	22,979
Accrued Liability (Vesting)	222,230	220,564	187,214
Accrued Liability (Inactives)	9,972,405	9,972,405	10,719,243
Total Actuarial Accrued Liability	14,840,227	14,783,978	14,960,172
Unfunded Actuarial Accrued Liability (UAAL)	5,358,035	5,301,786	5,855,525
Funded Ratio (AVA / AL)	63.9%	64.1%	60.9%

	New Benefits 1/1/2020	Old Benefits 1/1/2020	1/1/2019
D. Actuarial Present Value of Accrued Benefits			
Vested Accrued Benefits			
Inactives	9,972,405	9,972,405	10,719,243
Actives	1,293,424	1,286,315	1,137,253
Member Contributions	897,374	897,374	793,861
Total	12,163,203	12,156,094	12,650,357
Non-vested Accrued Benefits	391,729	390,847	331,421
Total Present Value Accrued Benefits	12,554,932	12,546,941	12,981,778
Funded Ratio (MVA / PVAB)	77.1%	77.2%	65.4%
Increase (Decrease) in Present Value of Accrued Benefits Attributable to:			
Plan Amendments	7,991	0	
Assumption Changes	0	0	
New Accrued Benefits	0	(568,579)	
Benefits Paid	0	(687,723)	
Interest	0	821,465	
Other	0	0	
Total	7,991	(434,837)	

	New Benefits	Old Benefits	
Valuation Date	1/1/2020	1/1/2020	1/1/2019
Applicable to Fiscal Year Ending	12/31/2021	12/31/2021	12/31/2020
E. Pension Cost			
Normal Cost [1]	$313,017	$299,269	$280,748
% of Total Annual Payroll [1]	29.0	27.7	27.6
Administrative Expenses [1]	13,330	13,330	22,875
% of Total Annual Payroll [1]	1.2	1.2	2.2
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 21 years (as of 1/1/2020) [1]	356,244	352,504	376,424
% of Total Annual Payroll [1]	33.0	32.7	37.0
Total Recommended Contribution	682,591	665,103	680,047
% of Total Annual Payroll [1]	63.2	61.6	66.8
Expected Member Contributions [1]	102,013	102,013	96,293
% of Total Annual Payroll [1]	9.5	9.5	9.5
Expected City Contribution	580,578	563,090	583,754
% of Total Annual Payroll [1]	53.7	52.1	57.3
F. Past Contributions			
Plan Years Ending:	12/31/2019		
Total Recommended Contribution	643,301		
City	539,993		
Actual Contributions Made:			
Members (excluding buyback)	103,308		
City	481,321		
Total	584,629		
G. Net Actuarial (Gain)/Loss	(637,757)		

[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:

Year	Projected Unfunded Accrued Liability
2020	5,358,035
2021	5,350,064
2022	5,329,106
2027	4,981,103
2032	4,068,828
2036	2,741,259
2041	0

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

		Actual	Assumed
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) 3 Year Comparison of Investment Return on Actuarial Value

		Actual	Assumed
Year Ended	12/31/2019	5.45%	6.50%
Year Ended	12/31/2018	4.21%	6.50%
Year Ended	12/31/2017	5.41%	6.50%

DEVELOPMENT OF JANUARY 1, 2020 AMORTIZATION PAYMENT

(1)	Unfunded Actuarial Accrued Liability as of January 1, 2019	$5,855,525
(2)	Sponsor Normal Cost developed as of January 1, 2019	167,320
(3)	Expected administrative expenses for the year ended December 31, 2019	21,479
(4)	Expected interest on (1), (2) and (3)	392,183
(5)	Sponsor contributions to the System during the year ended December 31, 2019	481,321
(6)	Expected interest on (5)	15,643
(7)	Expected Unfunded Actuarial Accrued Liability as of December 31, 2019, (1)+(2)+(3)+(4)-(5)-(6)	5,939,543
(8)	Change to UAAL due to Benefits Change	56,249
(9)	Change to UAAL due to Actuarial (Gain)/Loss	(637,757)
(10)	Unfunded Accrued Liability as of January 1, 2020	5,358,035
(11)	UAAL Subject to Amortization (100% AAL less Actuarial Assets)	5,358,035

Date Established	Years Remaining	1/1/2020 Amount	Amortization Amount
1/1/2020	21	5,358,035	334,501

DETAILED ACTUARIAL (GAIN)/LOSS ANALYSIS

(1)	Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2019	$5,855,525
(2)	Expected UAAL as of January 1, 2020	5,939,543
(3)	Summary of Actuarial (Gain)/Loss, by component:	
	Investment Return (Actuarial Asset Basis)	94,890
	Salary Increases	50,606
	Active Decrements	(54,271)
	Inactive Mortality	(734,490)
	Other	5,508
	Change in UAAL due to (Gain)/Loss	(637,757)
	Change to UAAL due to Benefits Change	56,249
(4)	Actual UAAL as of January 1, 2020	$5,358,035

RECONCILIATION OF CHANGES IN CONTRIBUTION REQUIREMENT

(1)	Contribution Determined as of January 1, 2019	$583,754
(2)	Summary of Contribution Impact by component:	
	Change in Normal Cost	18,521
	Change in Assumed Administrative Expense	(9,545)
	Investment Return (Actuarial Asset Basis)	6,309
	Salary Increases	3,365
	New Entrants	-
	Active Decrements	(3,608)
	Inactive Mortality	(48,835)
	Contributions (More) or Less than Recommended	4,028
	Increase in Amortization Payment Due to Payroll Growth Assumption	13,175
	Change in Expected Member Contributions	(5,720)
	Benefits Change	17,488
	Other	1,646
	Total Change in Contribution	(3,176)
(3)	Contribution Determined as of January 1, 2020	$580,578

PROJECTION OF BENEFIT PAYMENTS

Year	Payments for Current Actives	Payments for Current Inactives	Total Payments
2020	30,254	674,470	704,724
2021	50,603	653,623	704,226
2022	66,711	670,149	736,860
2023	83,217	686,541	769,758
2024	97,029	702,702	799,731
2025	112,675	718,516	831,191
2026	140,976	733,848	874,824
2027	162,099	748,536	910,635
2028	184,823	762,392	947,215
2029	204,468	775,198	979,666
2030	235,193	786,702	1,021,895
2031	271,509	796,620	1,068,129
2032	306,710	804,629	1,111,339
2033	365,604	810,381	1,175,985
2034	419,756	813,504	1,233,260
2035	477,534	813,603	1,291,137
2036	540,404	810,286	1,350,690
2037	603,257	803,167	1,406,424
2038	669,470	791,895	1,461,365
2039	751,784	776,166	1,527,950
2040	819,252	755,746	1,574,998
2041	880,741	730,481	1,611,222
2042	989,504	700,335	1,689,839
2043	1,070,374	665,481	1,735,855
2044	1,142,074	626,394	1,768,468
2045	1,199,991	583,807	1,783,798
2046	1,284,376	538,622	1,822,998
2047	1,344,070	491,807	1,835,877
2048	1,397,878	444,283	1,842,161
2049	1,495,728	396,889	1,892,617
2050	1,552,862	350,422	1,903,284
2051	1,600,754	305,627	1,906,381
2052	1,642,598	263,171	1,905,769
2053	1,676,424	223,654	1,900,078
2054	1,707,152	187,571	1,894,723
2055	1,732,743	155,247	1,887,990
2056	1,754,504	126,791	1,881,295
2057	1,773,336	102,138	1,875,474
2058	1,787,110	81,106	1,868,216
2059	1,798,646	63,425	1,862,071

ACTUARIAL ASSUMPTIONS AND METHODS

Interest Rate	6.50% per year compounded annually, net of investment related expenses. This is reasonable on a long-term basis and will continue to be monitored.
Mortality Rate	***Active Lives:*** PubS-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. ***Inactive Lives:*** PubS-2010 Healthy Retiree mortality, projected 5 years past the valuation date with Scale MP-2019. ***Beneficiaries:*** PubS-2010 Survivor mortality, projected 5 years past the valuation date with Scale MP-2019. ***Disabled Lives:*** PubS-2010 Disabled mortality, projected 5 years past the valuation date with Scale MP-2019. The mortality assumptions sufficiently accommodate anticipated future mortality improvements.
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	<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. <u>Tier 2:</u> 1.25% per year after the later of attainment of age 60 or first anniversary of retirement.

Salary Increases	See table below. This is based on a 2017 experience study performed for the State of Illinois Department of Insurance.

Salary Scale	
Service	Rate
0	12.50%
1	12.00%
2	10.00%
3	8.50%
4	7.50%
5	6.00%
6	4.50%
7-26	4.00%
27-30	3.75%
31+	3.50%

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 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	3.50% 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		% 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.

- 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 stayed about the same from January 1, 2017 to January 1, 2020, indicating that the plan's maturity level has not significantly changed during the period.

- 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 67.2%. 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 62.2% on January 1, 2017 to 63.9% on January 1, 2020, due mainly to net favorable 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, decreased from 0.0% on January 1, 2017 to -1.2% on January 1, 2020. The current Net Cash Flow Ratio of -1.2% 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

	1/1/2017	1/1/2018	1/1/2019	1/1/2020
Support Ratio				
Total Actives	13	13	13	13
Total Inactives	11	11	12	11
Actives / Inactives	118.2%	118.2%	108.3%	118.2%
Asset Volatility Ratio				
Market Value of Assets (MVA)	8,153,424	8,938,461	8,495,037	9,685,438
Total Annual Payroll	988,823	1,024,117	1,018,430	1,078,934
MVA / Total Annual Payroll	824.6%	872.8%	834.1%	897.7%
Accrued Liability (AL) Ratio				
Inactive Accrued Liability	9,177,216	9,251,102	10,719,243	9,972,405
Total Accrued Liability	13,741,771	14,078,535	14,960,172	14,840,227
Inactive AL / Total AL	66.8%	65.7%	71.7%	67.2%
Funded Ratio				
Actuarial Value of Assets (AVA)	8,551,478	8,925,845	9,104,647	9,482,192
Total Accrued Liability	13,741,771	14,078,535	14,960,172	14,840,227
AVA / Total Accrued Liability	62.2%	63.4%	60.9%	63.9%
Net Cash Flow Ratio				
Net Cash Flow [1]	(3,807)	(85,709)	(192,787)	(115,610)
Market Value of Assets (MVA)	8,153,424	8,938,461	8,495,037	9,685,438
Ratio	0.0%	-1.0%	-2.3%	-1.2%

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

STATEMENT OF FIDUCIARY NET POSITION
December 31, 2019

ASSETS	MARKET VALUE
Cash and Cash Equivalents:	
Cash and Short-Term Investments	417,594
Total Cash and Equivalents	417,594
Receivables:	
Accrued Past Due Interest	30,244
Total Receivable	30,244
Investments:	
Municipal Bonds	758,726
Corporate Bonds	560,364
U.S. Gov't and Agency Obligations	3,504,459
Mutual Funds	4,220,683
Total Investments	9,044,232
Other Assets	193,368
Total Assets	9,685,438
LIABILITIES	
Total Liabilities	0
Net Assets:	
Active and Retired Members' Equity	9,685,438
NET POSITION RESTRICTED FOR PENSIONS	9,685,438
TOTAL LIABILITIES AND NET ASSETS	9,685,438

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

<u>ADDITIONS</u>		
Contributions:		
Member	103,308	
City	481,321	
Total Contributions		584,629
Investment Income:		
Unrealized Gain (Loss)	1,062,099	
Net Increase in Fair Value of Investments		1,062,099
Interest & Dividends		263,185
Less Investment Expense [1]		(19,273)
Net Investment Income		1,306,011
Total Additions		1,890,640
<u>DEDUCTIONS</u>		
Distributions to Members:		
Benefit Payments and Refunds	687,723	
Total Distributions		687,723
Administrative Expenses		12,516
Total Deductions		700,239
Net Increase in Net Position		1,190,401
NET POSITION RESTRICTED FOR PENSIONS		
Beginning of the Year		8,495,037
End of the Year		9,685,438

[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.

Gains/(Losses) Not Yet Recognized

Plan Year		Amounts Not Yet Recognized by Valuation Year				
Ending	Gain/(Loss)	2020	2021	2022	2023	2024
4/30/2016	(504,080)	(33,606)	0	0	0	0
12/31/2016	(57,112)	(11,422)	0	0	0	0
12/31/2017	343,559	137,424	68,712	0	0	0
12/31/2018	(825,371)	(495,223)	(330,148)	(165,074)	0	0
12/31/2019	757,591	606,073	454,555	303,036	151,518	0
Total		203,246	193,119	137,962	151,518	0

Development of Investment Gain/Loss

Market Value of Assets, 12/31/2018	8,495,037
Contributions Less Benefit Payments & Administrative Expenses	(115,610)
Expected Investment Earnings[1]	548,420
Actual Net Investment Earnings	1,306,011
2019 Actuarial Investment Gain/(Loss)	757,591

[1] Expected Investment Earnings = 6.50% x (8,495,037 + 0.5 x -115,610)

Development of Actuarial Value of Assets

Market Value of Assets, 12/31/2019	9,685,438
(Gains)/Losses Not Yet Recognized	(203,246)
Actuarial Value of Assets, 12/31/2019	9,482,192
(A) 12/31/2018 Actuarial Assets:	9,104,647
(I) Net Investment Income:	
1. Interest and Dividends	263,185
2. Realized Gains (Losses)	0
3. Change in Actuarial Value	249,243
4. Investment Expenses	(19,273)
Total	493,155
(B) 12/31/2019 Actuarial Assets:	9,482,192
Actuarial Asset Rate of Return = (2 x I) / (A + B - I):	5.45%
Market Value of Assets Rate of Return:	15.48%
12/31/2019 Limited Actuarial Assets:	9,482,192
Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis)	(94,890)

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

INCOME		
Contributions:		
Member	103,308	
City	481,321	
Total Contributions		584,629
Earnings from Investments		
Interest & Dividends	263,185	
Change in Actuarial Value	249,243	
Total Earnings and Investment Gains		512,428
EXPENSES		
Administrative Expenses:		
Investment Related[1]	19,273	
Other	12,516	
Total Administrative Expenses		31,789
Distributions to Members:		
Benefit Payments and Refunds	687,723	
Total Distributions		687,723
Change in Net Assets for the Year		377,545
Net Assets Beginning of the Year		9,104,647
Net Assets End of the Year[2]		9,482,192

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

STATISTICAL DATA

	1/1/2017	1/1/2018	1/1/2019	1/1/2020
Actives - Tier 1				
Number	9	9	7	7
Average Current Age	42.3	43.3	42.1	43.1
Average Age at Employment	27.5	27.5	25.8	25.8
Average Past Service	14.8	15.8	16.3	17.3
Average Annual Salary	$82,505	$85,185	$90,824	$95,938
Actives - Tier 2				
Number	4	4	6	6
Average Current Age	29.6	30.6	29.4	30.4
Average Age at Employment	26.6	26.0	25.6	25.5
Average Past Service	3.0	4.6	3.8	4.9
Average Annual Salary	$61,570	$64,364	$63,777	$67,894
Service Retirees				
Number	9	9	10	9
Average Current Age	65.2	66.2	66.3	66.4
Average Annual Benefit	$62,539	$64,415	$65,174	$67,473
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	72.2	73.2	74.2	75.2
Average Annual Benefit	$31,596	$32,093	$32,594	$33,093
Terminated Vested				
Number	1	1	1	1
Average Current Age	38.7	39.7	40.7	41.7
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	0	2	0	0	0	1	0	0	0	0	0	3
30 - 34	0	0	0	0	0	2	0	0	0	0	0	2
35 - 39	0	0	0	1	0	0	3	0	0	0	0	4
40 - 44	0	0	0	0	0	0	1	2	0	0	0	3
45 - 49	0	0	0	0	0	0	0	0	0	0	0	0
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	0	2	0	1	0	3	4	2	0	0	1	13

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 1/1/2019	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	0
h. Total active life participants in valuation	13

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	10	0	1	1	12
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	9	0	1	1	11

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.

<u>Early Retirement</u>

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.

<u>Disability Benefit</u>

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.

<u>Cost-of-Living Adjustment</u>	**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.