

VILLAGE OF HOFFMAN ESTATES
FIREFIGHTERS' PENSION FUND
ACTUARIAL VALUATION
AS OF JANUARY 1, 2023
CONTRIBUTIONS APPLICABLE TO THE
PLAN/FISCAL YEAR ENDING DECEMBER 31, 2023



FOSTER & FOSTER
ACTUARIES AND CONSULTANTS



October 4, 2023

Board of Trustees
Village of Hoffman Estates Firefighters' Pension Fund

Re: Actuarial Valuation Report – Village of Hoffman Estates Firefighters' Pension Fund

Dear Board:

We are pleased to present to the Board this report of the annual actuarial valuation of the Village of Hoffman Estates 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.

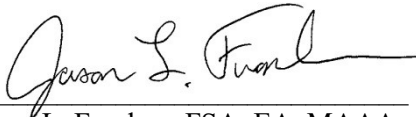
The undersigned are familiar with the immediate and long-term aspects of pension valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All of the sections of this report are considered an integral part of the 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 Village of Hoffman Estates, nor does anyone at Foster & Foster, Inc. act as a member of the Board of Trustees of the Village of Hoffman Estates 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 Village of Hoffman Estates Firefighters' Pension Fund, performed as of January 1, 2023, 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, 2022 actuarial report, are as follows:

Valuation Date	1/1/2023	1/1/2022
Applicable to Fiscal Year Ending	<u>12/31/2023</u>	<u>12/31/2022</u>
Total Recommended Contribution	\$7,692,923	\$7,247,283
% of Projected Annual Payroll	76.6%	75.7%
Member Contributions (Est.)	(949,811)	(904,980)
% of Projected Annual Payroll	(9.5%)	(9.5%)
Village Recommended Contribution	6,743,112	6,342,303
% of Projected Annual Payroll	67.1%	66.2%

As you can see, the Total Recommended Contribution shows an increase when compared to the results determined in the January 1, 2022 actuarial valuation report. The increase is attributable to employer contributions that were less than the recommended contribution, the natural increase in the amortization payment due to the payroll growth assumption, and unfavorable plan experience.

Plan experience was unfavorable overall on the basis of the plan's actuarial assumptions. Sources of unfavorable experience included an investment return of 5.70% (Actuarial Asset Basis) which fell short of the 6.75% assumption and lower than expected inactive mortality. There were no significant sources of favorable 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

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

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	<u>1/1/2023</u>	<u>1/1/2022</u>
A. Participant Data		
Number Included		
Actives	94	92
Service Retirees	63	62
Beneficiaries	14	14
Disability Retirees	14	15
Terminated Vested	<u>1</u>	<u>0</u>
Total	186	183
Total Annual Payroll	\$10,045,593	\$9,571,446
Payroll Under Assumed Ret. Age	10,045,593	9,571,446
Annual Rate of Payments to:		
Service Retirees	5,724,831	5,474,602
Beneficiaries	742,676	699,324
Disability Retirees	966,717	1,009,921
Terminated Vested	63,843	0
B. Assets		
Actuarial Value	108,971,544	105,009,748
Market Value	98,242,237	116,766,749
C. Liabilities		
Present Value of Benefits		
Actives		
Retirement Benefits	72,131,811	68,573,207
Disability Benefits	6,037,904	5,961,076
Death Benefits	656,926	643,303
Vested Benefits	2,153,216	2,167,233
Service Retirees	89,430,176	87,330,701
Beneficiaries	6,734,063	6,565,639
Disability Retirees	13,788,991	14,231,189
Terminated Vested	<u>872,442</u>	<u>0</u>
Total	191,805,529	185,472,348

C. Liabilities - (Continued)	<u>1/1/2023</u>	<u>1/1/2022</u>
Present Value of Future Salaries	91,243,997	88,827,004
Present Value of Future Member Contributions	8,627,120	8,398,593
Normal Cost (Retirement)	2,169,623	2,090,660
Normal Cost (Disability)	398,575	381,403
Normal Cost (Death)	54,100	51,428
Normal Cost (Vesting)	<u>145,749</u>	<u>138,486</u>
Total Normal Cost	2,768,047	2,661,977
Present Value of Future Normal Costs	22,256,910	22,109,582
Accrued Liability (Retirement)	54,721,388	51,223,464
Accrued Liability (Disability)	2,709,052	2,675,924
Accrued Liability (Death)	152,982	152,700
Accrued Liability (Vesting)	1,139,525	1,183,149
Accrued Liability (Inactives)	<u>110,825,672</u>	<u>108,127,529</u>
Total Actuarial Accrued Liability	169,548,619	163,362,766
Unfunded Actuarial Accrued Liability (UAAL)	60,577,075	58,353,018
Funded Ratio (AVA / AL)	64.3%	64.3%

	<u>1/1/2023</u>	<u>1/1/2022</u>
D. Actuarial Present Value of Accrued Benefits		
Vested Accrued Benefits		
Inactives	110,825,672	108,127,529
Actives	24,786,339	22,063,308
Member Contributions	<u>9,828,587</u>	<u>9,250,299</u>
Total	145,440,598	139,441,136
Non-vested Accrued Benefits	<u>3,507,384</u>	<u>3,074,694</u>
Total Present Value Accrued Benefits	148,947,982	142,515,830
Funded Ratio (MVA / PVAB)	66.0%	81.9%
Increase (Decrease) in Present Value of Accrued Benefits Attributable to:		
Plan Amendments	0	
Assumption Changes	0	
Plan Experience	4,467,821	
Benefits Paid	(7,405,550)	
Interest	9,369,881	
Other	<u>0</u>	
Total	6,432,152	

Valuation Date	1/1/2023	1/1/2022
Applicable to Fiscal Year Ending	<u>12/31/2023</u>	<u>12/31/2022</u>

E. Pension Cost

Normal Cost ¹	\$2,954,890	\$2,841,660
% of Total Annual Payroll ¹	29.4	29.7
Administrative Expenses ¹	39,210	52,884
% of Total Annual Payroll ¹	0.4	0.6
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 18 years (as of 1/1/2023) ¹	4,698,823	4,352,739
% of Total Annual Payroll ¹	46.8	45.4
Total Recommended Contribution	7,692,923	7,247,283
% of Total Annual Payroll ¹	76.6	75.7
Expected Member Contributions ¹	(949,811)	(904,980)
% of Total Annual Payroll ¹	(9.5)	(9.5)
Expected Village Contribution	6,743,112	6,342,303
% of Total Annual Payroll ¹	67.1	66.2

F. Past Contributions

Plan Years Ending:	<u>12/31/2022</u>
Total Recommended Contribution	7,279,326
Village Requirement	6,342,303
Actual Contributions Made:	
Members (excluding buyback)	937,023
Village	<u>4,537,332</u>
Total	5,474,355

G. Net Actuarial (Gain)/Loss 1,048,889

¹ Contributions developed as of 1/1/2023 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>
2023	60,577,075
2024	59,967,204
2025	59,163,455
2029	53,627,387
2033	43,271,852
2037	26,225,674
2041	0

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

		<u>Actual</u>	<u>Assumed</u>
Year Ended	12/31/2022	4.72%	5.12%
Year Ended	12/31/2021	6.20%	5.05%
Year Ended	12/31/2020	5.08%	4.98%
Year Ended	12/31/2019	4.04%	4.74%
Year Ended	12/31/2018	4.02%	4.98%

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

		<u>Actual MVA</u>	<u>Actual AVA</u>	<u>Assumed</u>
Year Ended	12/31/2022	-14.30%	5.70%	6.75%
Year Ended	12/31/2021	12.12%	11.63%	6.75%
Year Ended	12/31/2020	15.11%	10.15%	6.75%
Year Ended	12/31/2019	21.53%	6.47%	6.75%
Year Ended	12/31/2018	-5.16%	4.04%	6.75%

DEVELOPMENT OF JANUARY 1, 2023 AMORTIZATION PAYMENT

(1)	Unfunded Actuarial Accrued Liability as of January 1, 2022	\$58,353,018
(2)	Sponsor Normal Cost developed as of January 1, 2022	1,756,997
(3)	Expected administrative expenses for the year ended December 31, 2022	49,540
(4)	Expected interest on (1), (2) and (3)	4,059,098
(5)	Sponsor contributions to the System during the year ended December 31, 2022	4,537,332
(6)	Expected interest on (5)	153,135
(7)	Expected Unfunded Actuarial Accrued Liability as of December 31, 2022, (1)+(2)+(3)+(4)-(5)-(6)	59,528,186
(8)	Change to UAAL due to Benefits/Assumption Change	0
(9)	Change to UAAL due to Actuarial (Gain)/Loss	1,048,889
(10)	Unfunded Accrued Liability as of January 1, 2023	60,577,075
(11)	UAAL Subject to Amortization (100% AAL less Actuarial Assets)	60,577,075

<u>Date</u> <u>Established</u>	<u>Years</u> <u>Remaining</u>	<u>1/1/2023</u> <u>Amount</u>	<u>Amortization</u> <u>Amount</u>
1/1/2023	18	60,577,075	4,401,708

DETAILED ACTUARIAL (GAIN)/LOSS ANALYSIS

(1) Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2022	\$58,353,018
(2) Expected UAAL as of January 1, 2023	59,528,186
(3) Summary of Actuarial (Gain)/Loss, by component:	
Investment Return (Actuarial Asset Basis)	1,092,018
Salary Increases	34,008
Active Decrements	(406,160)
Inactive Mortality	603,179
Other	<u>(274,156)</u>
Change in UAAL due to (Gain)/Loss	1,048,889
Change to UAAL due to Benefits/Assumption Change	<u>0</u>
(4) Actual UAAL as of January 1, 2023	\$60,577,075

RECONCILIATION OF CHANGES IN CONTRIBUTION REQUIREMENT

(1) Contribution Determined as of January 1, 2022	\$ 6,342,303
(2) Summary of Contribution Impact by component:	
Change in Normal Cost	113,230
Change in Assumed Administrative Expense	(13,674)
Investment Return (Actuarial Asset Basis)	84,705
Salary Increases	2,638
New Entrants	1,455
Active Decrements	(31,505)
Inactive Mortality	46,787
Contributions (More) or Less than Recommended	144,733
Increase in Amortization Payment Due to Payroll Growth Assumption	141,464
Change in Expected Member Contributions	(44,831)
Benefits/Assumption Change	-
Other	<u>(44,193)</u>
Total Change in Contribution	400,809
(3) Contribution Determined as of January 1, 2023	\$6,743,112

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	1/1/2023	1/1/2022
Applicable to Fiscal Year Ending	<u>12/31/2023</u>	<u>12/31/2022</u>
Actuarial Accrued Liability (PUC)	165,179,323	158,836,472
Actuarial Value of Assets	<u>108,971,544</u>	<u>105,009,748</u>
Unfunded Actuarial Accrued Liability (UAAL)	56,207,779	53,826,724
UAAL Subject to Amortization	39,689,847	37,943,077
Normal Cost ¹	\$3,367,259	\$3,267,805
% of Total Annual Payroll ¹	33.5	34.1
Administrative Expenses ¹	39,210	52,884
% of Total Annual Payroll ¹	0.4	0.6
Payment Required to Amortize Unfunded Actuarial Accrued Liability over 18 years (as of 1/1/2023) ¹	3,078,649	2,830,295
% of Total Annual Payroll ¹	30.7	29.6
Total Required Contribution	6,485,118	6,150,984
% of Total Annual Payroll ¹	64.6	64.3
Expected Member Contributions ¹	(949,811)	(904,980)
% of Total Annual Payroll ¹	(9.5)	(9.5)
Expected Village Contribution	5,535,307	5,246,004
% of Total Annual Payroll ¹	55.1	54.8

Assumptions and Methods:

Actuarial Cost Method	Projected Unit Credit
Amortization Method	90% Funding by 2040

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

¹ Contributions developed as of 1/1/2023 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
2023	276,569	7,378,986	7,655,555
2024	702,997	7,511,930	8,214,927
2025	1,119,172	7,643,246	8,762,418
2026	1,543,169	7,837,053	9,380,222
2027	1,953,416	7,979,387	9,932,803
2028	2,385,692	8,130,165	10,515,857
2029	2,783,452	8,311,011	11,094,463
2030	3,164,763	8,417,794	11,582,557
2031	3,550,344	8,512,173	12,062,517
2032	3,979,995	8,592,492	12,572,487
2033	4,393,592	8,657,130	13,050,722
2034	4,774,651	8,713,922	13,488,573
2035	5,162,649	8,744,916	13,907,565
2036	5,577,142	8,756,243	14,333,385
2037	5,973,956	8,746,959	14,720,915
2038	6,346,858	8,716,184	15,063,042
2039	6,733,726	8,663,078	15,396,804
2040	7,110,446	8,586,753	15,697,199
2041	7,496,030	8,486,328	15,982,358
2042	7,921,174	8,360,903	16,282,077
2043	8,372,300	8,209,613	16,581,913
2044	8,945,236	8,031,764	16,977,000
2045	9,484,084	7,827,014	17,311,098
2046	10,044,315	7,595,544	17,639,859
2047	10,695,277	7,337,985	18,033,262
2048	11,237,540	7,055,613	18,293,153
2049	11,646,129	6,750,007	18,396,136
2050	12,021,445	6,423,168	18,444,613
2051	12,374,028	6,077,499	18,451,527
2052	12,669,598	5,715,735	18,385,333
2053	12,909,619	5,340,971	18,250,590
2054	13,100,910	4,956,772	18,057,682
2055	13,256,380	4,566,955	17,823,335
2056	13,422,005	4,175,507	17,597,512
2057	13,548,182	3,786,586	17,334,768
2058	13,630,693	3,404,308	17,035,001
2059	13,674,083	3,032,856	16,706,939
2060	13,679,449	2,676,240	16,355,689
2061	13,645,942	2,338,043	15,983,985
2062	13,573,321	2,021,465	15,594,786

ACTUARIAL ASSUMPTIONS AND METHODS

Interest Rate	6.75% per year compounded annually, net of investment related expenses.
Mortality Rate	<p>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.</p> <p>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).</p> <p>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).</p> <p>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).</p> <p>The mortality assumptions sufficiently accommodate anticipated future mortality improvements.</p>
Retirement Age	See table later in this section. This is based on retirement experience for Hoffman Estates firefighters over the period 1/1/2015 through 1/1/2018.
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 anticipated experience, considering the collective bargaining labor agreement between the Village and plan membership for the period of January 2021 to December 2023.

Salary Scale	
Service	Rate
0	9.00%
1-4	8.50%
5	9.00%
6	10.00%
7	4.50%
8-9	4.00%
10	4.50%
11+	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. 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

<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	10.00%	20	0.010%	50-51	10%	50-54	10%
25	8.00%	25	0.016%	52-54	25%	55-61	50%
30	4.00%	30	0.068%	55-61	50%	62+	100%
35	2.50%	35	0.220%	62+	100%		
40	1.20%	40	0.420%				
45+	1.00%	45	0.650%				
		50	0.900%				
		55	1.240%				
		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.

Accrued Actuarial Liability is determined according to the plan's actuarial cost method. This amount represents the portion of the anticipated future benefits allocated to years prior to the valuation date.

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

Market Value of Assets is the fair market value of plan assets as of the valuation date. This amount may be adjusted to produce an Actuarial Value of Assets for plan funding purposes.

Actuarial Value of Assets is the asset value used in the valuation to determine contribution requirements. It represents the plan's Market Value of Assets, with adjustments according to the Actuarial Asset Method. These adjustments produce a "smoothed" value that is likely to be less volatile from year to year than the Market Value of Assets.

Unfunded Accrued Liability is the excess of the Accrued Actuarial Liability over the Actuarial Value of Assets.

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.
- (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 113.4% on January 1, 2020 to 102.2% on January 1, 2023, indicating that the plan has been maturing.
- The Accrued Liability Ratio, determined as the ratio of the Inactive Accrued Liability, which is the liability associated with members who are no longer employed but are due a benefit from the plan, to the Total Accrued Liability, is 65.4%. With a plan of this maturity, losses due to lower than expected investment returns or demographic factors will need to be made up for over a shorter time horizon than would be needed for a less mature plan.
- The Funded Ratio, determined as the ratio of the Actuarial Value of Assets to the Total Accrued Liability, has increased from 60.2% on January 1, 2020 to 64.3% on January 1, 2023, due mainly to historical favorable experience. If the contribution deficit continues, the funded ratio will begin to decrease even if all assumptions are met.
- 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, 2020 to January 1, 2023. The current Net Cash Flow Ratio of -2.0% 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>1/1/2023</u>	<u>1/1/2022</u>	<u>1/1/2021</u>	<u>1/1/2020</u>
<u>Support Ratio</u>				
Total Actives	94	92	91	93
Total Inactives	92	91	89	82
Actives / Inactives	102.2%	101.1%	102.2%	113.4%

Asset Volatility Ratio

Market Value of Assets (MVA)	98,242,237	116,766,749	105,768,041	93,396,627
Total Annual Payroll	10,045,593	9,571,446	9,205,219	9,325,985
MVA / Total Annual Payroll	978.0%	1,219.9%	1,149.0%	1,001.5%

Accrued Liability (AL) Ratio

Inactive Accrued Liability	110,825,672	108,127,529	100,631,308	87,589,909
Total Accrued Liability	169,548,619	163,362,766	154,463,895	146,776,574
Inactive AL / Total AL	65.4%	66.2%	65.1%	59.7%

Funded Ratio

Actuarial Value of Assets (AVA)	108,971,544	105,009,748	95,696,862	88,420,013
Total Accrued Liability	169,548,619	163,362,766	154,463,895	146,776,574
AVA / Total Accrued Liability	64.3%	64.3%	62.0%	60.2%

Net Cash Flow Ratio

Net Cash Flow ¹	(1,967,926)	(1,719,507)	(1,619,870)	(1,430,059)
Market Value of Assets (MVA)	98,242,237	116,766,749	105,768,041	93,396,627
Ratio	-2.0%	-1.5%	-1.5%	-1.5%

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

STATEMENT OF FIDUCIARY NET POSITION
December 31, 2022

<u>ASSETS</u>	MARKET VALUE
Cash and Cash Equivalents:	
Investments - Illinois Funds	5,500,163
Checking Account	11,964
Total Cash and Equivalents	5,512,127
Receivables:	
Prepays	6,311
Taxes Receivable	1,031,153
Total Receivable	1,037,464
Investments:	
Pooled/Common/Commingled Funds	91,695,774
Total Investments	91,695,774
Total Assets	98,245,365
 <u>LIABILITIES</u>	
Liabilities:	
Payable:	
Expenses	3,128
Total Liabilities	3,128
Net Assets:	
Active and Retired Members' Equity	98,242,237
NET POSITION RESTRICTED FOR PENSIONS	98,242,237
TOTAL LIABILITIES AND NET ASSETS	98,245,365

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
FOR THE YEAR ENDED December 31, 2022
Market Value Basis

ADDITIONS

Contributions:

Member	937,023
Village	4,537,332

Total Contributions	5,474,355
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Investment Income:

Miscellaneous Income	(162,997)
Net Realized Gain (Loss)	(48,225)
Unrealized Gain (Loss)	(16,486,078)
Net Increase in Fair Value of Investments	(16,697,300)
Interest & Dividends	168,007
Less Investment Expense ¹	(27,293)

Net Investment Income	(16,556,586)
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Total Additions	(11,082,231)
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DEDUCTIONS

Distributions to Members:

Benefit Payments	7,403,210
Refund of Contributions/Transfers	2,340

Total Distributions	7,405,550
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Administrative Expenses	36,731
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Total Deductions	7,442,281
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Net Increase in Net Position	(18,524,512)
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NET POSITION RESTRICTED FOR PENSIONS

Beginning of the Year	116,766,749
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End of the Year	98,242,237
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¹ Investment Related expenses include investment advisory, custodial and performance monitoring fees.

ACTUARIAL ASSET VALUATION

December 31, 2022

Development of Actuarial Value of Assets

Market Value of Assets, 12/31/2022	98,242,237
(Gains)/Losses Not Yet Recognized	<u>10,729,307</u>
Actuarial Value of Assets, 12/31/2022	108,971,544
12/31/2022 Limited Actuarial Assets:	108,971,544

Development of Investment Gain/Loss

Market Value of Assets, 12/31/2021	116,766,749
Contributions Less Benefit Payments & Administrative Expenses	(1,967,926)
Expected Investment Earnings ¹	7,815,338
Actual Net Investment Earnings	<u>(16,556,586)</u>
2022 Actuarial Investment Gain/(Loss)	(24,371,924)

¹ Expected Investment Earnings = 6.75% x (116,766,749 + 0.5 x -1,967,926)

Gains/(Losses) Not Yet Recognized

Plan Year	Gain/(Loss)	Amounts Not Yet Recognized by Valuation Year				
Ending		2022	2023	2024	2025	2026
12/31/2019	11,447,073	2,289,415	0	0	0	0
12/31/2020	7,741,682	3,096,673	1,548,336	0	0	0
12/31/2021	5,636,906	3,382,144	2,254,762	1,127,381	0	0
12/31/2022	(24,371,924)	(19,497,539)	(14,623,154)	(9,748,770)	(4,874,385)	0
Total		(10,729,307)	(10,820,056)	(8,621,389)	(4,874,385)	0

Development of Asset Returns

(A) 12/31/2021 Actuarial Assets:	105,009,748
(I) Net Investment Income:	
1. Interest and Dividends	5,010
2. Realized Gains (Losses)	(48,225)
3. Change in Actuarial Value	6,000,230
4. Investment Expenses	<u>(27,293)</u>
Total	5,929,722
(B) 12/31/2022 Actuarial Assets:	108,971,544
Actuarial Asset Rate of Return = (2 x I) / (A + B - I):	5.70%
Market Value of Assets Rate of Return:	-14.30%
Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis)	(1,092,018)

CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS
December 31, 2022
Actuarial Asset Basis

INCOME		
Contributions:		
Member	937,023	
Village	4,537,332	
Total Contributions		5,474,355
Earnings from Investments		
Interest & Dividends	168,007	
Miscellaneous Income	(162,997)	
Net Realized Gain (Loss)	(48,225)	
Change in Actuarial Value	6,000,230	
Total Earnings and Investment Gains		5,957,015
EXPENSES		
Administrative Expenses:		
Investment Related ¹	27,293	
Other	36,731	
Total Administrative Expenses		64,024
Distributions to Members:		
Benefit Payments	7,403,210	
Refund of Contributions/Transfers	2,340	
Total Distributions		7,405,550
Change in Net Assets for the Year		3,961,796
Net Assets Beginning of the Year		105,009,748
Net Assets End of the Year ²		108,971,544

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

² Net Assets may be limited for actuarial consideration.

STATISTICAL DATA

	<u>1/1/2023</u>	<u>1/1/2022</u>	<u>1/1/2021</u>	<u>1/1/2020</u>
<u>Actives - Tier 1</u>				
Number	51	53	57	64
Average Current Age	48.3	47.3	46.9	46.7
Average Age at Employment	28.1	28.0	27.9	27.6
Average Past Service	20.2	19.3	19.0	19.1
Average Annual Salary	\$118,730	\$115,048	\$110,827	\$108,909
<u>Actives - Tier 2</u>				
Number	43	39	34	29
Average Current Age	32.6	32.3	31.8	31.4
Average Age at Employment	27.7	27.9	27.9	27.8
Average Past Service	4.9	4.4	3.9	3.6
Average Annual Salary	\$92,799	\$89,074	\$84,944	\$81,235
<u>Service Retirees</u>				
Number	63	62	58	52
Average Current Age	65.4	64.7	64.7	64.8
Average Annual Benefit	\$90,870	\$88,300	\$84,964	\$80,728
<u>Beneficiaries</u>				
Number	14	14	12	12
Average Current Age	74.6	74.2	73.8	72.8
Average Annual Benefit	\$53,048	\$49,952	\$49,301	\$49,301
<u>Disability Retirees</u>				
Number	14	15	16	16
Average Current Age	66.5	66.6	65.8	64.8
Average Annual Benefit	\$69,051	\$67,328	\$65,210	\$64,292
<u>Terminated Vested</u>				
Number	1	0	3	2
Average Current Age	43.8	N/A	39.0	32.7
Average Annual Benefit ¹	\$63,843	N/A	\$61,650	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	2	0	0	0	0	0	0	0	0	0	0	2
25 - 29	1	2	2	2	0	0	0	0	0	0	0	7
30 - 34	1	3	3	1	3	13	0	0	0	0	0	24
35 - 39	0	0	1	0	0	5	1	1	0	0	0	8
40 - 44	0	0	0	0	0	3	3	8	0	0	0	14
45 - 49	0	0	0	0	0	1	0	7	6	0	0	14
50 - 54	0	0	0	0	0	0	0	5	12	2	0	19
55 - 59	0	0	0	0	0	0	0	0	3	2	1	6
60 - 64	0	0	0	0	0	0	0	0	0	0	0	0
65+	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	5	6	3	3	22	4	21	21	4	1	94

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 1/1/2022	92
b. Terminations	
i. Vested (partial or full) with deferred benefits	(1)
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	<u>(1)</u>
f. Continuing participants	90
g. New entrants	<u>4</u>
h. Total active life participants in valuation	94

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	62	14	15	0	91
Retired	1	0	0	0	1
Vested Deferred	0	0	0	1	1
Death, With Survivor	0	1	(1)	0	0
Death, No Survivor	0	(1)	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	63	14	14	1	92

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.