Actuarial Funding Report

SPRINGFIELD FIREFIGHTERS' PENSION FUND

Actuarial Valuation
as of March 1, 2022

For the Contribution Year March 1, 2022 to February 28, 2023

LAUTERBACH & AMEN, LLP

Actuarial Valuation – Funding Recommendation

Lauterbach & Amen, LLP

CERTIFIED PUBLIC ACCOUNTANTS

SPRINGFIELD FIREFIGHTERS' PENSION FUND

Contribution Year Ending: February 28, 2023
Actuarial Valuation Date: March 1, 2022
Utilizing Data as of February 28, 2022

Submitted by:

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October 31, 2022

LAUTERBACH & AMEN, LLP

TABLE OF CONTENTS

TABLE OF CONTENTS

ACTUARIAL CERTIFICATION

This report documents the results of the Actuarial Valuation for the Springfield Firefighters' Pension Fund. The information was prepared for use by the Springfield Firefighters' Pension Fund and the City of Springfield, Illinois for determining the Benchmark Contribution, under the selected Funding Policy, and the Alternative Contribution for the Contribution Year March 1, 2022 to February 28, 2023. It is not intended or suitable for other purposes. Determinations for purposes other than the Employer's Actuarial Benchmark Contribution may be significantly different from the results herein.

The results in this report are based on the census data and financial information submitted by the City of Springfield, Illinois, and may include results from the prior Actuary. We did not prepare the Actuarial Valuations for the years prior to March 1, 2016. Those valuations were prepared by the prior Actuary whose reports have been furnished to us, and our disclosures are based on those reports. An audit of the prior Actuary's results was not performed, but high-level reviews were completed for general reasonableness, as appropriate, based on the purpose of this valuation. The accuracy of the results is dependent on the precision and completeness of the underlying information.

In addition, the results of the Actuarial Valuation involve certain risks and uncertainty as they are based on future assumptions, market conditions, and events that may never materialize as assumed. For this reason, certain assumptions and future results may be materially different than those presented in this report. See the *Management Summary* section of this report for a more detailed discussion of the Defined Benefit Plan Risks, as well as the limitations of this Actuarial Valuation on assessing those risks. We are not aware of any known events subsequent to the Actuarial Valuation Date, which are not reflected in this report but should be valued, that may materially impact the results.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The City of Springfield, Illinois selected certain assumptions, while others were the result of guidance and/or judgment from the Plan's Actuary or Advisors. We believe that the assumptions used in this valuation are reasonable and appropriate for the purposes for which they have been used. The selected assumptions represent our best estimate of the anticipated long-term experience of the Plan, and meet the guidelines set forth in the Actuarial Standards of Practice.

In preparing the results, our Actuaries used commercially available software (ProVal) developed by Winklevoss Technologies, LLC. This software is widely used for the purpose of performing Actuarial Valuations. Our Actuaries coded the plan provisions, assumptions, methods, and participant data summarized in this report, and reviewed the liability and cost outputs for reasonableness. We are not aware of any material weaknesses or limitations in the software, and have determined it is appropriate for performing this valuation.

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To the best of our knowledge, all calculations are in accordance with the applicable funding requirements, and the procedures followed and presentation of results conform to generally accepted actuarial principles and practices as prescribed by the Actuarial Standards Board. The undersigned consultants of Lauterbach & Amen, LLP, with actuarial credentials, meet the Qualification Standards of the American Academy of Actuaries to render this Actuarial Certification. There is no relationship between the City of Springfield, Illinois and Lauterbach & Amen, LLP that impairs our objectivity.

Respectfully Submitted,

LAUTERBACH & AMEN, LLP

Todd A. Schroeder

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MANAGEMENT SUMMARY

BENCHMARK CONTRIBUTION

	Prior Valuation	Current Valuation	Prior Statutory Requirement	Current Statutory Requirement
Benchmark Contribution	$17,120,702	$16,294,513	$14,466,233	$13,588,737
Expected Payroll	$19,091,136	$18,401,218	$19,091,136	$18,401,218
Benchmark Contribution as a Percent of Expected Payroll	89.68%	88.55%	75.77%	73.85%

The Statutory Requirement has Decreased by $877,496 from the Prior Valuation.

FUNDED STATUS

	Prior Valuation	Current Valuation	Prior Statutory Requirement	Current Statutory Requirement
Normal Cost	$5,027,661	$4,681,663	$4,497,677	$4,153,595
Fair Value of Assets	$159,297,661	$166,866,256	$159,297,661	$166,866,256
Actuarial Value of Assets	$153,680,034	$164,864,883	$153,680,034	$164,864,883
Actuarial Accrued Liability	$332,834,577	$330,680,533	$339,368,558	$337,366,623
Unfunded Actuarial Accrued Liability/(Surplus)	$179,154,543	$165,815,650	$185,688,524	$172,501,740
Percent Funded				
Actuarial Value of Assets	46.17%	49.86%	45.28%	48.87%
Fair Value of Assets	47.86%	50.46%	46.94%	49.46%

The Percent Funded has Increased by 3.69% on an Actuarial Value of Assets Basis.

In discussion with the City and the Pension Fund's Attorney, we have been informed that the Statutory Minimum Required Contribution calculated by the Illinois Firefighters' Pension Investment Fund constitutes the absolute minimum amount the municipality can contribute. If the Pension Fund or City elects to contribute under any other basis, they must ensure that the contribution elected equals or exceeds the Statutory Minimum Required Contribution calculated by the Illinois Firefighters' Pension Investment Fund.

MANAGEMENT SUMMARY – COMMENTS AND ANALYSIS

Contribution Results

Per the City's Funding Policy, contributions to the pension funds are based on the Illinois State Statute for Pension Funds.

The Illinois State Statutes for Pension Funds contain parameters that are used to determine the Statutory Minimum Contribution to a public Pension Fund. Those parameters and the resulting Statutory Minimum Contribution are found in the *Alternative Contribution* section of this report.

The Benchmark Contribution is based on the selected Funding Policy and methods that are outlined in the *Actuarial Funding Policies* section of this report.

"Contribution Risk" is defined by the Actuarial Standards of Practice as the potential for actual future contributions to deviate from expected future contributions. For example, when actual contributions are not made in accordance to the Plan's Funding Policy, or when future experience deviates materially from assumed. While it is essential for the Actuary and Plan Sponsor to collaborate on implementing a sound and financially feasible Funding Policy, it is important to note that the Actuary is not required, and is not in the position to, evaluate the ability or willingness of the Plan Sponsor to make the Statutory Minimum under the selected Funding Policy.

As a result, while Contribution Risk may be a significant source of risk for the Plan, this Actuarial Valuation makes no attempt to assess the impact of future contributions falling short of those recommended under the selected Funding Policy. Notwithstanding the above, see the *Actuarial Benchmark Contribution – Reconciliation* section of this report for the impact on the current Benchmark Contribution of any contribution shortfalls or excesses from the prior year.

Defined Benefit Plan Risks

Asset Growth:

Pension funding involves preparing Fund assets to pay for benefits when Members retire. During their working careers, assets grow with contributions and investment earnings; and then, the Pension Fund distributes assets in retirement. Based on the Plan's current mix of Members and Funded Status, the Plan should experience positive asset growth, on average, if the Benchmark Contributions are made and expected investment earnings come in. In the current year, the Fund asset growth was positive by approximately $7,569,000.

Asset growth is important in the long-term. Long-term cash flow out of the Pension Fund is primarily benefit payments, and expenses are a smaller portion. The Plan should monitor the impact of expected benefit payments on future asset growth. We assess and project all future benefit payments as part of the determination of liability. The assessment is made on all current Members of the Fund, both active and inactive. For active Members, the assessment includes the probability that Members terminate or retire and begin receiving benefits. In the next 5 years, benefit payments are anticipated to increase 25-30%, or approximately $4,511,000. In the next 10 years, the expected increase in benefit payments is 55-60%, or approximately $9,427,000. The estimated increase in benefit payments is being compared against the benefits paid to inactive Members during the fiscal year, excluding any refunds of Member Contributions.

Furthermore, plans with a large number of inactive Members have an increased “Longevity Risk”. Longevity Risk is the possibility that inactive Members may live longer than projected by the Plan’s mortality assumption. As shown in the previous paragraph, benefit payments are expected to increase over the next 5-year and 10-year horizons. The projected increases assume that current inactive Members pass away according to the Plan’s mortality assumption. To the extent that current inactive Members live longer than expected, the future 5-year and 10-year benefit projections may be larger than the amounts disclosed in the previous paragraph. Higher levels of benefit payments, payable for a longer period of time, may cause a significant strain to the Plan’s cash flow, future Benchmark Contributions, and may lead to Plan insolvency.

Unfunded Liability:
Unfunded Liability represents the financial shortfall of the Actuarial Value of Assets compared to the Actuarial Accrued Liability. To the extent that Unfunded Liability exists, the Plan is losing potential investment earnings due to the financial shortfall. Contributions towards Unfunded Liability pay for the lost investment earnings, as well as the outstanding unfunded amount. If payments towards Unfunded Liability are not made, the Unfunded Liability will grow.

In the early 1990s, many Pension Funds in Illinois adopted an increasing payment towards Unfunded Liability due to a change in legislation. The initial payment decreased, and future payments are anticipated to increase annually after that. In many situations, payments early on were less than the interest on Unfunded Liability, which means that Unfunded Liability increased even though contributions were made at the recommended level.

The current Benchmark Contribution includes a payment towards Unfunded Liability that is approximately $1,516,000 greater than the interest on Unfunded Liability. All else being equal, and contributions being made, Unfunded Liability is expected to decrease. The Employer and Fund should anticipate that improvement in the current Percent Funded will be mitigated in the short-term. The Employer and Fund should understand this impact as we progress forward to manage expectations.

Actuarial Value of Assets:
The Pension Fund smooths asset returns that vary from expectations over a 5-year period. The intention is that asset returns for purposes of funding recommendations are a combination of several years. The impact is intended to smooth out the volatility of Benchmark Contributions over time, but not necessarily increase or decrease the level of contributions over the long-term.

When asset returns are smoothed, there are always gains or losses on the Fair Value of Assets that are going to be deferred for current funding purposes, and recognized in future years. Currently, the Pension Fund is deferring approximately $2,001,000 in gains on the Fair Value of Assets. These are asset gains that will be recognized in upcoming periods, independent of the future performance of the Fair Value of Assets.

Cash Flow Risk:
Assets, liabilities, and Funded Status are good metrics to monitor over time to assess the progress of the Funding Policy. However, these metrics may provide limited forward-looking insights. Specifically, the maturity of a Pension Fund can pose certain risks that often cannot be assessed with a point-in-time metric such as Percent Funded.

For example, two different Pension Funds could have the same Percent Funded, but have completely different risk profiles. One Fund might mostly cover active Members with little to no Members in pay status, whereas a second Fund might mostly cover inactive Members with a significant level of annual benefit payments. The latter Fund has a greater "Cash Flow Risk", i.e. a more significant chance that negative cash flows could lead to a deteriorating, rather than improving, Percent Funded over time.

It is important to note that, in general, positive net cash flows are good, but also need to be sufficient to cover the growth in the liabilities (i.e. the Normal Cost as well as interest on the Actuarial Accrued Liability). Typically, when cash flows are assumed to be insufficient to cover the growth in liabilities, the Percent Funded will decline, while future Benchmark Contributions will increase.

For this Plan, the Fair Value of Assets is less than the Actuarial Accrued Liability for inactive Members. The Fund assets and anticipated investment earnings are not sufficient to cover the benefits payable to the current inactive Members. In addition, there is currently no money set aside for active Member liability. There are two consequences. First, we are limiting the impact of investment earnings on accruing money for the active Members due to utilizing those dollars to pay for the current inactive Members. Second, there is Cash Flow Risk that exists in that a higher portion of the assets is needed to keep up with cash flow out for benefit payments, and a higher relative investment return is required to keep cash flow positive in any given year.

Benefit Payment Risk:
Ideally, plans in a sound financial position will have the ratio of annual benefits payments to the Fair Value of Assets to be less than the Expected Rate of Return on Investments assumption (i.e. 7.00%). Theoretically, in this case it can be considered that investment returns will fully cover the annual benefit payments, and therefore, all Employer and Member Contributions made to the Fund will be used to pay for future benefit accruals and pay down the existing Unfunded Liability. To the extent that the ratio of the annual benefit payments to the Fair Value of Assets increases to above the Expected Rate of Return on Investments assumption, the Plan may experience some additional risks, such as the need to keep assets in more liquid investments, inability to pay down Unfunded Liability, and may lead to Plan insolvency.

As of the Valuation Date, the Springfield Firefighters' Pension Fund has a ratio of benefit payments to the Fair Value of Assets of 10.07%. In this case, a portion of the Employer Contributions are being used to pay the annual benefit payments creating Benefit Payment Risk and Cash Flow Risk. The Percent Funded of the Plan may not grow as quickly as expected under the current Funding Policy, since the amortization payment towards the Unfunded Liability is not being fully realized. As shown in the *Asset Growth* section of this report, the 5-year and 10-year horizons of future benefit payments are expected to increase. The Plan Sponsor should monitor the percentage of annual benefit payments to the Fair Value of Assets and consider changing the Funding Policy if this ratio continues to increase.

Fund Assets

The results in this report are based on the assets held in the Pension Fund. Assets consist of funds held for investment and for benefit payments as of the Actuarial Valuation Date. In addition, assets may be adjusted for other events representing dollars that are reasonably expected to be paid out from the Pension Fund or deposited into the Pension Fund after the Actuarial Valuation Date as well.

The current Fund assets are audited.

The Fund Assets Used in this Report are Audited.

The Actuarial Value of Assets under the Funding Policy is equal to the Fair Value of Assets, with unexpected gains and losses smoothed over 5 years. More detail on the Actuarial Value of Assets can be found in the *Actuarial Funding Policies* section of this report.

<u>Demographic Data</u>
Demographic factors can change from year to year within the Pension Fund. Changes in this category include hiring new Members, Members retiring or becoming disabled, inactive Members passing away, and other changes. Demographic changes can cause an actuarial gain (contribution that is less than expected compared to the prior year) or an actuarial loss (contribution that is greater than expected compared to the prior year).

Demographic gains and losses occur when the assumptions over the one-year period for Member changes do not meet our long-term expectation. For example, if no Members become disabled during the year, we would expect a liability gain. If more Members become disabled than anticipated during the year, we would expect a liability loss. Generally, we expect short-term fluctuations in demographic experience to create gains or losses of 1%-3% of the Actuarial Accrued Liability in any given year, but to balance out in the long-term.

"Demographic Risk" occurs when Plan demographic experience differs significantly from expected. Similar to Longevity Risk discussed previously, additional risk is created when demographic experience differs from the assumed rates of disability, retirement, or termination. Under the chosen assumptions, actuarial gains and/or losses will always occur, as the assumptions will never be exactly realized. However, the magnitude of the gain and/or loss and its influence on the Benchmark Contribution largely depends on the size of the Plan.

Based on the number of active Members in the Plan, the Benchmark Contribution has a low risk of having a significant increase due to demographic experience. For example, 1 new disabled Member would typically generate a substantial increase to the Actuarial Accrued Liability. However, due to the size of the Plan, there is an appropriate means to absorb demographic losses without causing a significant increase to the Benchmark Contribution.

In the current report, the key demographic changes were as follows:

Retirement: There were 10 Members of the Fund who retired during the year. When a Member retires, the Normal Cost will decrease. Any change in the Actuarial Accrued Liability will be considered when determining the amount to pay towards Unfunded Liability each year. The increase in the Benchmark Contribution in the current year due to the retirement experience is approximately $83,200.

Disability: There were 3 Members of the Fund who became disabled during the year. When a Member becomes disabled, the Fund will often experience a decrease in Normal Cost, but an increase in Unfunded Liability. The increase in the Benchmark Contribution in the current year due to the disability experience is approximately $46,000.

Mortality: There were 5 retirees and 3 disabled Members who passed away during the year, 2 of whom had an eligible surviving spouse. When a beneficiary passes away, the Fund liability will decrease as the Pension Fund no longer will make future payments to the beneficiary. If there is an eligible surviving spouse, the Fund liability will increase to represent the value of the expected payments that will be made to the spouse.

As inactive Members age and continue to collect benefits, the Fund liability will also increase. In the current year, there were 237 inactive Members who maintained their benefit collection status throughout the year. The net decrease in the Benchmark Contribution in the current year due to the mortality experience is approximately $23,400.

Salary Increases: Salary increases were less than anticipated in the current year. This caused a decrease in the Benchmark Contribution in the current year of approximately $41,900.

Assumption Changes

In the current valuation, we have reviewed the individual pay increases assumption to reflect the wage schedule between the City of Springfield, Illinois and the Springfield Fire Fighters Local 37 of the International Association of Fire Fighters for the period March 1, 2021 through February 28, 2025. The year over year step increases dictated by the wage schedule did not change significantly from the prior wage schedule; therefore, we have not updated the individual pay increases assumption.

Funding Policy Changes

The Funding Policy was not changed from the prior valuation.

Other Considerations

The best due diligence continues to be the process of annually reviewing assumptions, provisions, and methodologies. Our commitment to reviewing new information regularly continues to be at the forefront of our reporting. In the current valuation, we have updated the underlying valuation software to value the most accurate estimate of Surviving Spouse benefits, including the expected Cost-of-Living Adjustments, described under the Illinois State Statutes. As a result, this caused a decrease in the Actuarial Accrued Liability of approximately $16,810,000, with a corresponding decrease in the Benchmark Contribution of approximately $1,491,000.

ACTUARIAL BENCHMARK CONTRIBUTION – RECONCILIATION

Actuarial Accrued Liability is expected to increase each year for both interest for the year and as active Members earn additional service years towards retirement. Similarly, Actuarial Accrued Liability is expected to decrease when the Fund pays benefits to inactive Members.

Contributions are expected to increase as expected pay increases under the Funding Policy for the Fund.

	Actuarial Liability	Benchmark Contribution
Prior Valuation	$ 332,834,577	$ 17,120,702
Expected Changes	11,438,282	556,427
Initial Expected Current Valuation	$ 344,272,859	$ 17,677,129

Other increases or decreases in Actuarial Accrued Liability (key changes noted below) will increase or decrease the amount of Unfunded Liability in the Plan. To the extent that Unfunded Liability increases or decreases unexpectedly, the contribution towards Unfunded Liability will also change unexpectedly.

	Actuarial Liability	Benchmark Contribution
Salary Increases Less than Expected	$ (620,196)	$ (41,885)
Actuarial Experience	(12,972,130)	(1,436,897)
Asset Return Greater than Expected*	-	(87,654)
Contributions Less than Expected	-	183,820
Total Increase/(Decrease)	$ (13,592,326)	$ (1,382,616)
Current Valuation	$ 330,680,533	$ 16,294,513

*Impact on the Benchmark Contribution due to asset return is on an Actuarial Value of Assets basis.

The Actuarial Experience can be attributable to several factors including Actuarial Valuation software changes, demographic changes, and benefit payment experience compared to expectation. Key demographic changes were discussed in the *Demographic Data* section of this report.

VALUATION OF FUND ASSETS

FAIR VALUE OF ASSETS

Statement of Assets

	Prior Valuation	Current Valuation
Cash and Cash Equivalents	$ 5,314,410	$ 8,457,721
State and Local Obligations	1,814,244	-
US Government and Agency Obligations	21,658,326	-
Corporate Bonds	27,926,499	-
Insurance Contracts	13,303,652	-
Pooled Investment Accounts	-	158,425,681
Stock Equities	6,524,688	-
Mutual Funds	82,463,603	-
Receivables (Net of Payables)	292,239	(17,146)
Total Fair Value of Assets	$ 159,297,661	$ 166,866,256

The Total Fair Value of Assets has Increased by Approximately $7,569,000 from the Prior Valuation.

Statement of Changes in Assets

Total Fair Value of Assets - Prior Valuation	$ 159,297,661
Plus - Employer Contributions	14,818,690
Plus - Member Contributions	1,760,624
Plus - Return on Investments	7,942,634
Less - Benefit Payments and Refunds	(16,801,355)
Less - Other Expenses	(151,998)
Total Fair Value of Assets - Current Valuation	$ 166,866,256

The Rate of Return on Investments on a Fair Value of Assets Basis for the Fund was Approximately 4.89% Net of Administrative Expense.

The Rate of Return on Investments shown above has been determined as a percent of the average of the prior and current Fair Value of Assets on the Statement of Changes in Assets. The Return on Investments is net of Other Expenses, and has been excluded from the Total Fair Value of Assets at the end of the Fiscal Year for this calculation.

FAIR VALUE OF ASSETS (GAIN)/LOSS

Current Year (Gain)/Loss on Fair Value of Assets

Total Fair Value of Assets - Prior Valuation	$ 159,297,661
Employer and Member Contributions	16,579,314
Benefit Payments and Refunds	(16,801,355)
Expected Return on Investments	11,143,065
Expected Total Fair Value of Assets - Current Valuation	$ 170,218,685
Actual Total Fair Value of Assets - Current Valuation	166,866,256
Current Fair Value of Assets (Gain)/Loss	$ 3,352,429
Expected Return on Investments	$ 11,143,065
Actual Return on Investments (Net of Expenses)	7,790,636
Current Fair Value of Assets (Gain)/Loss	$ 3,352,429

The Actual Return on Investments on a Fair Value of Assets Basis was Less than Expected for the Current Year.

The (Gain)/Loss on the current Fair Value of Assets has been determined based on the Expected Rate of Return on Investments as shown in the *Actuarial Assumptions* section of this report.

VALUATION OF FUND ASSETS

DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS

Total Fair Value of Assets - Current Valuation		$ 166,866,256
Adjustment for Prior (Gains)/Losses		
	Full Amount	Deferral
FYE 2022	$ 3,352,429	2,681,943
FYE 2021	(12,426,736)	(7,456,042)
FYE 2020	3,351,516	1,340,606
FYE 2019	7,160,600	1,432,120
Total Deferred (Gain)/Loss		(2,001,373)
Initial Actuarial Value of Assets - Current Valuation		$ 164,864,883
Less Contributions for the Current Year and Interest		-
Adjustment for the Corridor		-
Total Actuarial Value of Assets - Current Valuation		$ 164,864,883

The Actuarial Value of Assets is Equal to the Fair Value of Assets with Unanticipated (Gains)/Losses Recognized Over 5 Years. The Actuarial Value of Assets is 98.80% of the Fair Value of Assets.

ACTUARIAL VALUE OF ASSETS (GAIN)/LOSS

Total Actuarial Value of Assets - Prior Valuation	$ 153,680,034
Plus - Employer Contributions	14,818,690
Plus - Member Contributions	1,760,624
Plus - Return on Investments	11,558,888
Less - Benefit Payments and Refund	(16,801,355)
Less - Other Expenses	(151,998)
Total Actuarial Value of Assets - Current Valuation	$ 164,864,883

The Rate of Return on Investments on an Actuarial Value of Assets Basis for the Fund was Approximately 7.43% Net of Administrative Expense.

The Actuarial Value of Assets incorporates portions of gains and losses over multiple years.

HISTORICAL ASSET PERFORMANCE

The chart below shows the historical Rates of Return on Investments for both Fair Value of Assets and Actuarial Value of Assets.

	Fair Value of Assets	Actuarial Value of Assets
FYE 2022	4.89%	7.43%
FYE 2021	16.02%	8.42%
FYE 2020	4.48%	4.58%
FYE 2019	1.61%	5.05%
FYE 2018	9.23%	6.62%
FYE 2017	13.30%	5.83%
FYE 2016	(5.10%)	4.60%

The historical Rates of Return on Investments shown above were calculated based on the annual Return on Investments, as a percentage of the average value of the assets for the year.

For purposes of determining the average value of assets for the year, the ending Fair Value of Assets has been adjusted to net out to the portion related to the Return on Investments themselves. All other cash flows are included.

For purposes of determining the annual Return on Investments we have adjusted the figures shown on the preceding pages. The figures shown on the preceding pages are net of Investment Expenses. We have made an additional adjustment to net out Administrative Expenses. Netting out Administrative Expenses allows us to capture returns for the year that can be used to make benefit payments as part of the ongoing actuarial process.

The adjustments we made are for actuarial reporting purposes only. By netting out Administrative Expenses and capturing Return on Investments that are available to pay benefits, it provides us a comparison to the Expected Rate of Return on Investments, but does not provide a figure that would be consistent with the rates of return that are determined by other parties. Therefore, this calculated Return on Investments should not be used to analyze investment performance of the Fund or the performance of the investment professionals.

Expected Rate of Return on Investments Assumption

The Expected Rate of Return on Investments for this valuation is 7.00%. Lauterbach & Amen, LLP does not provide investment advice. We look at a variety of factors when reviewing the Expected Rate of Return on Investments assumption selected by the Board. These factors include: historical Rates of Return on Investments, capital market projections performed by the Fund's investment advisors, the Fund's investment policy, capital market forward-looking benchmark expected returns by independent investment companies, rates used by comparable pension systems, and other factors identified in the Actuarial Standards of Practice.

Generally speaking, the ideal assumption for Expected Rate of Return on Investments is one that has a 50% chance of being met over the long-term. If actual returns going forward come in less than expected, the pension system risks deferring contributions to the future that should be made today and creating additional contribution volatility. Reducing the Expected Rate of Return on Investments by 25 basis points produces a Benchmark Contribution that is 5.14% higher than currently shown.

"Investment Risk" is the potential that actual Return on Investments will be different from what is expected. The selected Expected Rate of Return on Investments assumption is chosen to be a long-term assumption, producing a return that, on average, would produce a stable rate of return over a long-term horizon. Actual asset returns in the short-term may deviate from this long-term assumption due to current market conditions. Furthermore, establishing the Expected Rate of Return on Investments assumption may be dependent on the Illinois State Statutes pertaining to the limitations on types of investments Plan Sponsors may use. If the actual annual rates of return are less than the Expected Rate of Return on Investments, actuarial losses will be produced, thus increasing the Plan's Unfunded Liability and, subsequently, future Benchmark Contributions.

"Asset/Liability Mismatch" risk is a similar concept as Investment Risk, as it relates to setting the Expected Rate of Return on Investments assumption compared to the actual Return on Investments achieved. The Interest Rate used to discount future Plan liabilities is set equal to the Expected Rate of Return on Investments. It is expected that the selected Interest Rate be a rate that is reasonably expected to be achieved over the long-term. To the extent that the selected Interest Rate to value Plan liabilities is unreasonable, or significantly different than the actual Return on Investments earned over an extended period of time, additional Interest Rate risk is created. For example, determining Plan liabilities at an Interest Rate higher than what is expected to be achieved through investment returns results in Unfunded Liability that is not a true representation of the Plan's condition and Percent Funded. As a result, the Actuarial Accrued Liability determined is an amount smaller than the liability that would be produced with an Interest Rate more indicative of future Expected Rate of Return on Investments. Therefore, the Benchmark Contributions under the established Funding Policy may not be sufficient to appropriately meet the true pension obligations.

BENCHMARK CONTRIBUTION DETAIL

ACTUARIAL ACCRUED LIABILITY

	Prior Valuation	Current Valuation
Active Members	$ 90,470,278	$ 85,460,857
Inactive Members		
Terminated Members	917,024	963,690
Retired Members	209,774,423	210,877,691
Disabled Members	14,863,760	16,056,316
Other Beneficiaries	16,809,092	17,321,979
Total Inactive Members	242,364,299	245,219,676
Total Actuarial Accrued Liability	$ 332,834,577	$ 330,680,533

The Total Actuarial Accrued Liability has Decreased by Approximately $2,154,000 from the Prior Valuation.

FUNDED STATUS

	Prior Valuation	Current Valuation
Total Actuarial Accrued Liability	$ 332,834,577	$ 330,680,533
Total Actuarial Value of Assets	153,680,034	164,864,883
Unfunded Actuarial Accrued Liability	$ 179,154,543	$ 165,815,650
Total Fair Value of Assets	$ 159,297,661	$ 166,866,256
Percent Funded		
Actuarial Value of Assets	46.17%	49.86%
Fair Value of Assets	47.86%	50.46%

The Percent Funded as of the Actuarial Valuation Date is Subject to Volatility on Assets and Liability in the Short-Term.

Development of the Employer Normal Cost

	Prior Valuation	Current Valuation
Total Normal Cost	$ 5,027,661	$ 4,681,663
Estimated Member Contributions	(1,781,346)	(1,717,257)
Employer Normal Cost	$ 3,246,315	$ 2,964,406

At a 100% Funding Level, the Normal Cost Contribution is Still Required.

Normal Cost as a Percentage of Expected Payroll

	Prior Valuation	Current Valuation
Expected Payroll	$ 19,091,136	$ 18,401,218
Member Normal Cost Rate	9.455%	9.455%
Employer Normal Cost Rate	16.88%	15.99%
Total Normal Cost Rate	26.34%	25.44%

Ideally, the Employer Normal Cost Rate will Remain Stable.

Benchmark Contribution Breakdown

	Prior Valuation	Current Valuation
Employer Normal Cost*	$ 3,473,557	$ 3,171,914
Amortization of Unfunded Accrued Liability/(Surplus)	13,647,145	13,122,599
Recommended Contribution	$ 17,120,702	$ 16,294,513

The Benchmark Contribution has Decreased by 4.83% from the Prior Valuation.

*Employer Normal Cost Contribution includes interest through the end of the Fiscal Year.

Schedule of Amortization – Unfunded Actuarial Accrued Liability

Below is the schedule of remaining amortization balances for the Unfunded Liability.

Unfunded Liability Base	Initial Balance	Date Established	Current Balance	Years Remaining	Payment
Investment (Gain)/Loss	$ (1,107,580)	2/28/2022	$ (1,107,580)	18	$ (87,654)
Actuarial (Gain)/Loss	(13,127,779)	2/28/2022	(13,127,779)	18	(1,038,928)
Contribution Experience	2,002,793	2/28/2022	2,002,793	18	158,500
Investment (Gain)/Loss	(2,438,677)	2/28/2021	(2,423,617)	18	(191,804)
Actuarial (Gain)/Loss	(1,949,047)	2/28/2021	(1,937,011)	18	(153,294)
Contribution Experience	2,142,879	2/28/2021	2,129,647	18	168,540
Investment (Gain)/Loss	2,946,769	2/29/2020	2,918,269	18	230,951
Actuarial (Gain)/Loss	(5,207,062)	2/29/2020	(5,156,700)	18	(408,099)
Contribution Experience	2,334,587	2/29/2020	2,312,008	18	182,972
Assumption Changes	3,095,277	2/29/2020	3,065,340	18	242,590
Plan Changes	1,757,848	2/29/2020	1,740,847	18	137,770
Investment (Gain)/Loss	2,237,932	2/28/2019	2,213,798	18	175,199
Actuarial (Gain)/Loss	1,911,427	2/28/2019	1,890,814	18	149,639
Contribution Experience	2,284,716	2/28/2019	2,260,076	18	178,862
Assumption Changes	903,321	2/28/2019	893,579	18	70,718
Investment (Gain)/Loss	31,900	2/28/2018	31,589	18	2,500
Actuarial (Gain)/Loss	(1,200,111)	2/28/2018	(1,188,408)	18	(94,051)
Contribution Experience	2,684,479	2/28/2018	2,658,299	18	210,377
Initial Unfunded Liability	$ 168,280,902	2/28/2018	$ 166,639,686	18	$ 13,187,811
Total	**$ 167,584,574**		**$ 165,815,650**		**$ 13,122,599**

The Actuarial (Gain)/Loss can be attributable to several factors including Actuarial Valuation software changes, demographic changes, Employer Contribution timing, Member Contribution experience, benefit payment experience, and salary increase experience compared to expectation.

ACTUARIAL METHODS – BENCHMARK CONTRIBUTION

Actuarial Valuation Date	March 1, 2022
Data Collection Date	February 28, 2022
Actuarial Cost Method	Entry Age Normal (Level % Pay)
Amortization Method	Level % Pay (Closed)
Amortization Target	100% Funded Over 18 Years
Asset Valuation Method	5-Year Smoothed Fair Value

The contributions and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census data furnished, using the Actuarial Cost Method described. The Actuarial Cost and Amortization Methods allocate the projected obligations of the Plan over the working lifetimes of the Plan Members.

The Benchmark Contribution amount shown in this report is based on the methods summarized above. The *Actuarial Funding Policies* section of this report includes a more detailed description of the Actuarial Funding Methods being used.

The Actuarial Funding Methods are meant to provide a systematic process for determining contributions on an annual basis. The methods do not impact the expectation of future benefit payments. The methods only impact the way contributions are made towards future benefit payments.

Different Actuarial Funding Methods may achieve funding goals with differing levels of success. Certain methods are more efficient and more stable on an annual basis.

ALTERNATIVE CONTRIBUTION

ACTUARIAL ACCRUED LIABILITY

	Prior Valuation	Current Valuation
Active Employees	$ 97,004,259	$ 92,146,947
Inactive Employees		
Terminated Members - Vested	917,024	963,690
Retired Members	209,774,423	210,877,693
Disabled Members	14,863,760	16,056,316
Other Beneficiaries	16,809,092	17,321,979
Total Inactive Members	242,364,299	245,219,678
Total Actuarial Accrued Liability	$ 339,368,558	$ 337,366,625

The Total Actuarial Accrued Liability has Decreased by Approximately $2,002,000 from the Prior Valuation.

FUNDED STATUS

	Prior Valuation	Current Valuation
Total Actuarial Accrued Liability	$ 339,368,558	$ 337,366,625
Total Actuarial Value of Assets	153,680,034	164,864,883
Unfunded Actuarial Accrued Liability	$ 185,688,524	$ 172,501,742
Total Fair Value of Assets	$ 159,297,661	$ 166,866,256
Percent Funded		
Actuarial Value of Assets	45.28%	48.87%
Fair Value of Assets	46.94%	49.46%

The Percent Funded as of the Actuarial Valuation Date is Subject to Volatility on Assets and Liability in the Short-Term.

DEVELOPMENT OF THE EMPLOYER NORMAL COST

	Prior Valuation	Current Valuation
Total Normal Cost	$ 4,497,677	$ 4,153,595
Estimated Member Contributions	(1,781,346)	(1,717,257)
Employer Normal Cost	$ 2,716,331	$ 2,436,338

At a 100% Funding Level, the Normal Cost Contribution is Still Required.

NORMAL COST AS A PERCENTAGE OF EXPECTED PAYROLL

	Prior Valuation	Current Valuation
Expected Payroll	$ 19,091,136	$ 18,401,218
Member Normal Cost Rate	9.331%	9.332%
Employer Normal Cost Rate	14.23%	13.24%
Total Normal Cost Rate	23.56%	22.57%

Ideally, the Employer Normal Cost Rate will Remain Stable.

STATUTORY MINIMUM CONTRIBUTION

	Prior Valuation	Current Valuation
Employer Normal Cost*	$ 2,906,474	$ 2,606,882
Amortization of Unfunded Accrued Liability/(Surplus)	11,559,759	10,981,855
Funding Requirement	$ 14,466,233	$ 13,588,737

The Statutory Requirement has Decreased by 6.07% from the Prior Valuation.

*Employer Normal Cost Contribution includes interest through the end of the Fiscal Year.

ALTERNATIVE CONTRIBUTION

The Alternative Contribution is based on Actuarial Funding Methods and funding parameters outlined in the Illinois State Statutes for pension funding. The resulting contribution is lower than the Benchmark Contribution for the current year. The Alternative Contribution amount is not recommended because it represents only a deferral of contributions when compared to the Benchmark Contribution method.

Actuarial Funding Methods for pensions are best applied to provide a balance between the long-term goals of a variety of stakeholders:

1. Members – the Members are interested in benefit security and having the funds available to pay benefits when retired

2. Employers – cost control and cost stability over the long-term

3. Taxpayers – paying for the services they are receiving from active Members

The Alternative Contribution methods are not intended to provide a better system in any of the above categories long-term. The parameters are not recommended for a long-term funding strategy.

The funding methods and parameters put into place in the Illinois State Statutes in 2011 were intended to provide short-term budget relief for Employer Contributions. An Employer using the parameters outlined in the Illinois State Statutes for current funding should view the contributions as short-term relief. Our recommendation in this situation is for a Pension Fund and an Employer to work towards a long-term funding strategy that better achieves the long-term funding goals, over a period that does not exceed 3-5 years.

The Securities and Exchange Commission in 2013 used the phrase "Statutory Underfunding" to describe situations where contributions appear to be more manageable in the short-term, but set up future Benchmark Contributions that are less likely to be manageable.

ACTUARIAL METHODS – ALTERNATIVE CONTRIBUTION

Actuarial Valuation Date	March 1, 2022
Data Collection Date	February 28, 2022
Actuarial Cost Method	Projected Unit Credit
Amortization Method	Level % Pay (Closed)
Amortization Target	90% Funded Over 18 Years
Asset Valuation Method	5-Year Smoothed Fair Value

The contribution and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census data furnished, using the Actuarial Cost Method described. The Actuarial Cost and Amortization methods allocate the projected obligations of the Plan over the working lifetimes of the Plan Members.

The Actuarial Funding Methods are meant to provide a systematic process for determining contributions on an annual basis. The methods do not impact the expectation of future benefit payments. The methods only impact the way contributions are made towards future benefit payments.

Different Actuarial Funding Methods may achieve funding goals with differing levels of success. Certain methods are more efficient and more stable on an annual basis.

The guidelines in the Illinois State Statutes for pension funding are silent on the use of a corridor on the Fair Value of Assets in determination of the Actuarial Value of Assets. In the current valuation, the Plan Sponsor has elected to use a 10% corridor in the determination of the Actuarial Value of Assets for both the Alternative Contribution and the Benchmark Contribution. In the event that the Actuarial Value of Assets exceeds 110% of the Fair Value of Assets or falls below 90% of the Fair Value of Assets, the excess gains or losses will be recognized immediately.

ACTUARIAL VALUATION DATA

Active Members
Inactive Members
Summary of Monthly Benefit Payments
Age and Service Distribution

Active Members

	Prior Valuation	Current Valuation
Tier I	134	122
Tier II	79	78
Total Active Members	213	200
Total Payroll	$ 18,785,866	$ 18,106,980

Inactive Members

	Prior Valuation	Current Valuation
Terminated Members	2	2
Retired Members	176	181
Disabled Members	22	22
Other Beneficiaries	47	49
Total Inactive Members	247	254

Summary Of Monthly Benefit Payments

	Prior Valuation	Current Valuation
Retired Members	$ 1,138,835	$ 1,200,628
Disabled Members	85,961	91,193
Other Beneficiaries	153,095	161,432
Total Inactive Members	$ 1,377,891	$ 1,453,253

AGE AND SERVICE DISTRIBUTION

3/1/2022 Age and Service Distribution - All Active Members												
	Service	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	Total
Age												
Under 25												
25 to 29			5									5
30 to 34			10	15	4							29
35 to 39			6	16	16	2						40
40 to 44				9	17	18	3					47
45 to 49					4	18	21					43
50 to 54						8	21	4	1			34
55 to 59							1	1				2
60 to 64												
65 to 69												
70 & up												
Total			21	40	41	46	46	5	1			200

ACTUARIAL FUNDING POLICIES

Actuarial Cost Method
Financing Unfunded Actuarial Accrued Liability
Actuarial Value of Assets

Actuarial Cost Method

The Actuarial Cost Method allocates the projected obligations of the Plan over the working lifetimes of the Plan Members.

In accordance with the Pension Fund's Funding Policy the Actuarial Cost Method for the Benchmark Contribution basis is Entry Age Normal (Level Percent of Pay). The Entry Age Normal Cost Method is a method under which the Actuarial Present Value of the projected benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age. The portion of this Actuarial Present Value allocated to a valuation year is called Normal Cost. The portion of the Actuarial Present Value not provided at an Actuarial Valuation Date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

The Entry Age Normal method attempts to create a level cost pattern. In contrast to other Actuarial Cost Methods which inherently lead to uneven or less predictable cost patterns, the Entry Age Normal method is generally understood to be less risky in terms of contribution stability from year to year.

The Conference of Consulting Actuaries Public Plans Community produced a "white paper" detailing Funding Policy model practices for public sector pension plans. Under the Level Cost Actuarial Methodology ("LCAM"), one of the principal elements to a Funding Policy is the Actuarial Cost Method. When deciding which Actuarial Cost Method to use, several objectives may be considered, such as the following:

- Each Member's benefit should be funded under a reasonable allocation method by the expected retirement date
- Pay-related benefit costs should reflect anticipated pay at retirement
- The expected cost of each year of service (i.e. Normal Cost) for each active Member should be reasonably related to the expected cost of that Member's benefit
- The Member's Normal Cost should emerge as a level percent of Member compensation
- No gains or losses should occur if all assumptions are met.

Following these criteria, the use of the Entry Age Normal Cost Method (Level Percent of Pay) is a model practice.

Financing Unfunded Actuarial Accrued Liability

The Unfunded Actuarial Accrued Liability may be amortized over a period either in level dollar amounts or as a level percentage of projected payroll.

When amortizing the Unfunded Actuarial Accrued Liability as a level percentage of payroll, additional risk is incurred since the amortization payments in the early years of the payment period may not be large enough to cover the interest accrued on the existing Unfunded Liability. As a result, the Unfunded

Liability may increase initially, before the amortization payments grow large enough to cover all interest accruals. Generally speaking, the Plan Sponsor will be required to contribute a larger total contribution amount over the course of the funding period under a level percentage of payroll basis as compared to a level dollar payroll schedule.

The Government Finance Officers Association notes that best practices in public pension finance include utilizing amortization periods that do not exceed 20 years. Longer amortization periods elevate the risk of failing to reduce any Unfunded Liability. For example, when the amortization payment in full only covers interest on the Unfunded Liability, but does not reduce the existing Unfunded Liability, the required contribution will increase in future years.

A second principal element under the Level Cost Actuarial Methodology described above is to establish an Amortization Policy that determines the length of time and the structure of the increase or decrease in contributions required to systematically fund the Unfunded Actuarial Accrued Liability. When deciding on the Amortization Policy, several objectives may be considered, such as the following:

- Variations in the source of liability changes (i.e. gains or losses, Plan changes, assumption changes) should be funded over periods consistent with an appropriate balance between the policy objectives of demographic matching and volatility management
- The cost changes in Unfunded Actuarial Accrued Liability should emerge as a level percentage of Member compensation

The LCAM model practices for the Amortization Policy include the following:

- Layered fixed period amortization by source
- Level percent of pay amortization
- An amortization period ranging from 15-20 years for experience gains or losses
- An amortization period of 15-25 years for assumption changes

In accordance with the Pension Fund's Funding Policy for the Benchmark Contribution, the Unfunded Actuarial Accrued Liability is amortized by level percent of payroll contributions to a 100% funding target over the remaining 18 years. See the *Actuarial Methods – Benchmark Contribution* section of this report for more detail.

We believe that the amortization period is appropriate for the purposes of this valuation.

ACTUARIAL VALUE OF ASSETS

The Pension Fund is an ongoing plan. The Employer wishes to smooth the effect of volatility in the Fair Value of Assets on the annual contribution. Therefore, the Actuarial Value of Assets is equal to the Fair Value of Assets with unanticipated gains/losses recognized over a five-year period.

The Asset Valuation Method is intended to create an Actuarial Value of Assets that remains reasonable in relation to the Fair Value of Assets over time. The method produces results that can fall either above or below the Fair Value of Assets. The period of recognition is short.

It is intended that the period of recognition is short enough to keep the Actuarial Value of Assets within a decent range of the Fair Value of Assets. In the event that the Actuarial Value of Assets exceeds or falls below a 10% corridor of the Fair Value of Assets, the additional gain or loss will be recognized immediately.

ACTUARIAL ASSUMPTIONS

Nature of Actuarial Calculations
Actuarial Assumptions in the Valuation Process
Assessment of Risk Exposures
Limitations of Risk Analysis
Assessment and Use of Actuarial Models
Actuarial Assumptions Utilized

NATURE OF ACTUARIAL CALCULATIONS

The results documented in this report are estimates based on data that may be imperfect and on assumptions about future events. Certain Plan Provisions may be approximated or deemed immaterial, and, therefore, are not valued. Assumptions may be made about census data or other factors. Reasonable efforts were made in this valuation to ensure that significant items in the context of the Actuarial Accrued Liability or costs are treated appropriately, and not excluded or included inappropriately.

Actual future experience will differ from the assumptions used in the calculations. As these differences arise, the expense for accounting purposes will be adjusted in future valuations to reflect such actual experience.

A range of results different from those presented in this report could be considered reasonable. The numbers are not rounded, but this is for convenience only and should not imply precision which is not inherent in actuarial calculations.

ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS

The contributions and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census data furnished, using the Actuarial Cost Method described in the *Actuarial Funding Policies* section of this report.

The principal areas of financial risk which require assumptions about future experience are:

- Expected Rate of Return on Investments
- Patterns of Pay Increases for Members
- Rates of Mortality Among Active and Inactive Members
- Rates of Termination Among Active Members
- Rates of Disability Among Active Members
- Age Patterns of Actual Retirements

Actual experience of the Pension Fund will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments to the computed Benchmark Contribution.

Details behind the selection of the actuarial assumptions can be found in the Actuarial Assumption Summary document provided to the client upon request. The client has reviewed and approved the assumptions as a reasonable expectation of the future anticipated experience under the Plan.

ASSESSMENT OF RISK EXPOSURES

From time to time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations). In addition, Actuarial Standards of Practice require that the Actuary minimally perform a qualitative assessment of key financial and demographic risks as part of the risk assessment process with each annual Actuarial Valuation. The risk assessments we perform include, but are not limited to, the following:

- Periodic demographic experience studies every 3 to 5 years to confirm the ongoing appropriateness of actuarial assumptions
- Highlight the impact of demographic experience over the past year, as well as other sources of change and volatility in the *Actuarial Benchmark Contribution – Reconciliation* section of this report
- Detail year-over-year changes in contribution levels, assets, liabilities, and Funded Status in the *Benchmark Contribution* and *Funded Status* sections in the *Management Summary* section of this report
- Review any material changes in the census as summarized in the *Actuarial Valuation Data* section of this report
- Provide and discuss the Actuarial Assumption Summary document highlighting the rationale for each key assumption chosen by the Board
- Identify potential Cash Flow Risk by highlighting expected benefit payments over the next 5-year and 10-year periods in the *Asset Growth* section in the *Management Summary* section of this report
- Describe the impact of any assumption, method, or policy change in the *Management Summary* section of this report
- Utilize supplemental information, such as the GASB Discount Rate sensitivity disclosures to understand, for example, what impact an alternative Expected Rate of Return on Investments assumption might have on the estimation of Actuarial Accrued Liability and Funded Status
- Utilize supplemental information, such as the GASB solvency test, to better understand the Cash Flow Risk and long-term sustainability of the Plan.

LIMITATIONS OF RISK ANALYSIS

Since future experience may never be precisely as assumed, the process of selecting funding methods and actuarial assumptions may inherently create risk and volatility of results. A more detailed evaluation of the above risk exposures is beyond the scope and nature of the annual Actuarial Valuation process. For example, scenario tests, sensitivity tests, stress tests, and/or stochastic modeling for multi-year projections to assess the impact of alternative assumptions and methods, or modeling future experience different from the assumptions in these results, are not included in this Actuarial Valuation.

The Springfield Firefighters' Pension Fund and/or the City of Springfield, Illinois should contact the Actuary if they desire a more detailed assessment of any of these forward-looking risk exposures.

ASSESSMENT AND USE OF ACTUARIAL MODELS

Actuarial Valuations rely upon the use of actuarial modeling software to predict the occurrence of future events, which include specific demographic and financial potential outcomes. Actuarial assumptions are established to provide a guideline to use for such modeling.

- The model used in this Actuarial Valuation is intended to determine the Benchmark Contribution, under the selected Funding Policy. The actuarial assumptions used were developed with this goal in mind.
- There are no known material limitations or inconsistencies among the actuarial assumptions or methods.
- The output from the model is reasonable based on the individual actuarial assumptions and based on the actuarial assumptions in the aggregate.
- The actuarial software used to calculate plan liabilities has been purchased from an outside vendor. We have performed thorough testing of the software, including review of sample participants, to ensure the intended purpose of the model, the operation of the model, sensitivities and dependencies, and strengths and limitations of the model are sufficient for this purpose.
- Census data and financial information have been provided by client professionals, financial advisors, and/or auditors, who are known to be experts in their respective fields. We rely on the fact that the information provided by these experts has been given for the intended purpose of this Actuarial Valuation.
- Where applicable, certain actuarial assumptions and Funding Policy may be required as prescribed by law. In such instances, we have followed legal guidance to ensure conformity.
- The Expected Rate of Return on Investments assumption has been chosen using input from several sources; including, but not limited to: client professionals, financial advisors, auditors, and other capital market outlooks. We have relied on the information provided, in the aggregate, to settle on the selected Expected Rate of Return on Investments assumption.

As stated in the *Limitations of Risk Analysis* section, future experience may never be precisely as assumed. As a result, the funding methods and actuarial assumptions used in the model may create volatility in the results when compared year after year. A more detailed evaluation of this volatility is beyond the scope and nature of the annual Actuarial Valuation process. In such cases, additional scenario tests, sensitivity tests, stress tests, and/or stochastic modeling for multi-year projections to assess the impact of alternative assumptions and methods, or modeling future experience different from the assumptions in these results, may be performed to determine a range of reasonable results.

ACTUARIAL ASSUMPTIONS UTILIZED

Expected Rate of Return on Investments 7.00% Net of Administrative Expense

CPI-U 2.25%

Total Payroll Increases 3.25%

Individual Pay Increases* 3.75% - 16.54%

Individual pay increases include a long-term average increase for inflation, average annual increases for promotions, and any additional increases for a step program. Sample rates are as follows:

Service	Rate	Service	Rate
0	16.54%	8	3.75%
1	14.75%	9	5.70%
2	13.36%	10	3.75%
3	3.75%	15	3.75%
4	6.50%	20	3.75%
5	3.75%	25	3.75%
6	3.75%	30	3.75%
7	3.75%	35	3.75%

*Individual pay increases for active Members hired at age 40 or older are assumed annual increases at the ultimate rate reduced by 50 basis points, without adjustments in early service years.

Retirement Rates

100% of the L&A Assumption Study for Firefighters 2020 Cap Age 65. Sample rates are as follows:

Age	Rate	Age	Rate
50	7.00%	58	17.15%
51	7.00%	59	17.15%
52	7.00%	60	20.00%
53	7.00%	61	20.00%
54	7.00%	62	20.00%
55	17.15%	63	25.00%
56	17.15%	64	25.00%
57	17.15%	65	100.00%

Termination Rates

100% of the L&A Assumption Study for Firefighters 2020. Sample rates are as follows:

Age	Rate	Age	Rate
25	7.02%	40	1.25%
30	4.07%	45	0.41%
35	2.41%	50	0.00%

Disability Rates

100% of the L&A Assumption Study for Firefighters 2020. Sample rates are as follows:

Age	Rate	Age	Rate
25	0.07%	40	0.54%
30	0.09%	45	0.75%
35	0.27%	50	0.97%

75% of active Members who become disabled are assumed to be in the Line of Duty.

Mortality Rates

Active Mortality follows the Sex Distinct Raw Rates as developed in the PubS-2010(A) Study. Mortality improvement uses MP-2019 Improvement Rates applied on a fully generational basis.

50% of active Member deaths are assumed to be in the Line of Duty.

Retiree Mortality follows the L&A Assumption Study for Firefighters 2020. These rates are experience weighted with the Sex Distinct Raw Rates as developed in the PubS-2010(A) Study improved to 2017 using MP-2019 Improvement Rates. These rates are then improved fully generationally using MP-2019 Improvement Rates.

Disabled Mortality follows the L&A Assumption Study for Firefighters 2020. These rates are experience weighted with the Sex Distinct Raw Rates as developed in the PubS-2010 Study for disabled participants improved to 2017 using MP-2019 Improvement Rates. These rates are then improved fully generationally using MP-2019 Improvement Rates.

Spouse Mortality follows the Sex Distinct Raw Rates as developed in the PubS-2010(A) Study for contingent survivors. For all rates not provided there (ages 45 and younger) the PubG-2010 Study for general employees was used. Mortality improvement uses MP-2019 Improvement Rates applied on a fully generational basis.

Marital Assumptions

Active Members: 80% of active Members are assumed to be married. Female spouses are assumed to be 3 years younger than male spouses.

Retiree and Disabled Members: Actual spousal data was utilized for retiree and disabled Members.

SUMMARY OF PRINCIPAL PLAN PROVISIONS

Establishment of the Fund
Administration
Member Contributions
Regular Retirement Pension Benefit
Early Retirement Pension Benefit
Surviving Spouse Benefit
Termination Benefit – Vested
Disability Benefit

Establishment of the Fund

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

Administration

The Firefighters' Pension Fund is administered by a Board of Trustees whose duties are to manage the Pension Fund, determine applications for pensions, authorize payment of pensions, establish rules, pay expenses, invest assets, and keep records.

Member Contributions

Members contribute 9.455% of pensionable salary.

Regular Retirement Pension Benefit

Tier I

Eligibility: Age 50 with at least 20 years of creditable service.

Benefit: 50% of final salary for the first 20 years of service, plus an additional 2.5% of final salary for each year of service beyond 20 years of service, pro-rated monthly, and not to exceed 75% of final salary. "Final salary" is based on the firefighter's pensionable salary attached to rank held on the last day of service.

Annual Increase in Benefit: A firefighter is entitled to receive an initial increase equal to 1/12 of 3% of the original monthly benefit for each full month that has passed since the pension began. The initial increase date will be the latter of the first day of the month after the pensioner turns age 55 or the first day of the month after the benefit date anniversary. Subsequent increases of 3% of the current monthly benefit will be granted every January 1st thereafter.

REGULAR RETIREMENT PENSION BENEFIT - CONTINUED

Tier II

Eligibility: Age 55 with at least 10 years of creditable service.

Benefit: 2.5% of final average salary for each year of service, and not to exceed 75% of final average salary. "Final average salary" is determined by dividing the total pensionable salary during 48 consecutive months of service within the last 60 months of service in which total pensionable salary was the highest, by the number of months of service in that period (or by dividing the total pensionable salary during 96 consecutive months of service within the last 120 months of service in which total pensionable salary was the highest, by the number of months of service in that period, if greater). Annual salary for this purpose will not exceed the salary cap, indexed by the lesser of 3% or the CPI-U for the 12 months ending with the September preceding each November 1st. The salary cap will not decrease.

Annual Increase in Benefit: The initial increase date will be the latter of the January 1st after the pensioner turns age 60 or the January 1st after the benefit date anniversary. Subsequent increases will be granted every January 1st thereafter. The initial increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1st.

EARLY RETIREMENT PENSION BENEFIT

Tier I

None.

Tier II

Eligibility: Age 50 with at least 10 years of creditable service.

Benefit: The regular retirement pension benefit reduced by ½ of 1% for each month that the firefighters' age is between 50 and 55.

Annual Increase in Benefit: The initial increase date will be the latter of the January 1st after the pensioner turns age 60 or the January 1st after the benefit date anniversary. Subsequent increases will be granted every January 1st thereafter. The initial increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1st.

SURVIVING SPOUSE BENEFIT

Tier I

Eligibility: Married to an active firefighter, a disabled pensioner at the time of death, or a retired pensioner (at least 12 months prior to the time of death if married post-retirement).

Active Line of Duty Death Benefit: An eligible surviving spouse is entitled to receive 100% of the firefighter's final pensionable salary attached to rank held on the last day of service.

Non-Duty Death Benefit:

Disabled or Retired Pensioner: An eligible surviving spouse is entitled to receive the greater of the pensioner's benefit at the time of death or 54% of the pensioner's final pensionable salary attached to rank held on the last day of service.

Active Member: An eligible surviving spouse is entitled to receive the greater of the firefighter's eligible benefit at the time of death or 54% of the firefighter's final pensionable salary attached to rank held on the last day of service.

Annual Increase in Benefit: None.

Tier II

Eligibility: Married to an active firefighter, a disabled pensioner at the time of death, or a retired pensioner (at least 12 months prior to the time of death if married post-retirement).

Active Line of Duty Death Benefit: An eligible surviving spouse is entitled to receive 100% of the firefighter's final pensionable salary attached to rank held on the last day of service.

Non-Duty Death Benefit:

Disabled or Retired Pensioner and Active Member: An eligible surviving spouse is entitled to receive the greater of 66⅔% of the firefighter's earned pension benefit at the time of death or 54% of the firefighter's monthly salary at the time of death.

Annual Increase in Benefit: The initial increase date will be the January 1st after the surviving spouse turns age 60. Subsequent increases will be granted every January 1st thereafter. The initial increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1st.

TERMINATION BENEFIT – VESTED

Tier I

Eligibility: Age 60 with at least 10 but less than 20 years of creditable service.

Benefit: An accrual factor times final salary for each year of service. "Accrual factor" is a factor of 1.5% at 10 years of service, increasing ratably up to 2.4% at 19 years of service. "Final salary" is based on the firefighter's pensionable salary attached to rank held on the last day of service.

Annual Increase in Benefit: A firefighter is entitled to receive an initial increase equal to 1/12 of 3% of the original monthly benefit for each full month that has passed since the pension began. The initial increase date will be the first day of the month after the benefit date anniversary. Subsequent increases of 3% of the current monthly benefit will be granted every January 1st thereafter.

Tier II

None.

DISABILITY BENEFIT

Tier I

Eligibility: Duty Disability, Non-Duty Disability with at least 7 years of creditable service, or Occupational Disease Disability with at least 5 years of creditable service.

Benefit: For a duty disability or an occupational disease disability with at least 5 years of creditable service, a firefighter is entitled to receive the greater of 65% of final salary or the regular retirement pension benefit at the time of disability. For a non-duty disability with at least 7 years of creditable service, a firefighter is entitled to receive 50% of final salary. "Final salary" is based on the firefighter's pensionable salary attached to rank held on the last day of service.

Annual Increase in Benefit: A firefighter is entitled to receive an initial increase equal to 3% of the original monthly benefit for each full year that has passed since the pension began. The initial increase date will be the latter of the January 1st after following pensioner turns age 60 or the January 1st after the benefit date anniversary. Subsequent increases of 3% of the original monthly benefit will be granted every January 1st thereafter.

Tier II

Eligibility: Duty Disability, Non-Duty Disability with at least 7 years of creditable service, or Occupational Disease Disability with at least 5 years of creditable service.

Benefit: For a duty disability or an occupational disease disability with at least 5 years of creditable service, a firefighter is entitled to receive the greater of 65% of final salary or the regular retirement pension benefit at the time of disability. For a non-duty disability, a firefighter is entitled to receive 50% of final salary. "Final salary" is based on the firefighter's pensionable salary attached to rank held on the last day of service.

Annual Increase in Benefit: A firefighter is entitled to receive an initial increase equal to 3% of the original monthly benefit for each full year that has passed since the pension began. The initial increase date will be the latter of the January 1st after following pensioner turns age 60 or the first day of the month after the benefit date anniversary. Subsequent increases of 3% of the original monthly benefit will be granted every January 1st thereafter.

GLOSSARY OF TERMS

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Actuarial Accrued Liability – The Actuarial Present Value of future benefits based on Members' service rendered to the Measurement Date using the selected Actuarial Cost Method. It is that portion of the Actuarial Present Value of Plan benefits and expenses allocated to prior years of employment. It is not provided for by future Normal Costs.

Actuarial Cost Method – The method used to allocate the projected obligations of the Plan over the working lifetimes of the Plan Members.

Actuarial Value of Assets – The value of the assets used in the determination of the Unfunded Actuarial Accrued Liability. The Actuarial Value of Assets is related to Fair Value of Assets, with adjustments made to spread unanticipated gains and losses for a given year over a period of several years. Actuarial Value of Assets is generally equally likely to fall above or below the Fair Value of Assets, and generally does not experience as much volatility over time as the Fair Value of Assets.

Asset Valuation Method **–** A valuation method designed to smooth random fluctuations in asset values. The objective underlying the use of an Asset Valuation Method is to provide for the long-term stability of Employer Contributions.

Funding Policy – A set of procedures for a Pension Fund that outlines the "best practices" for funding the pension benefits based on the goals of the Plan Sponsor. A Funding Policy discusses items such as assumptions, Actuarial Cost Method, assets, and other parameters that will best help the Plan Sponsor meet their goal of working in the best interest of the Plan Members.

Fair Value of Assets – The value of the cash, bonds, securities, and other assets held in the pension trust as of the Measurement Date.

Normal Cost – The present value of future benefits earned by Members during the current Fiscal Year. It is that portion of the Actuarial Present Value of benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Unfunded Actuarial Accrued Liability **–** The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The Unfunded Actuarial Accrued Liability is amortized over a period either in level dollar amounts or as a level percentage of projected payroll.

Lauterbach & Amen, LLP

CERTIFIED PUBLIC ACCOUNTANTS