

**MIDLAND FIREMEN'S
RELIEF AND RETIREMENT FUND**

ACTUARIAL VALUATION
AS OF DECEMBER 31, 2023



FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

May 21, 2024

Ms. Christy Weakland, CPA
City of Midland
300 N. Loraine
P.O. Box 1152
Midland, TX 79701

Re: Midland Firemen's Relief and Retirement Fund

Dear Christy:

We are pleased to present this report of the actuarial valuation of the Midland Firemen's Relief and Retirement Fund. The funding valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and to develop the funding period required to amortize any existing Unfunded Actuarial Accrued Liability. Please note that this valuation may not be applicable for any other purposes.

The valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board, and reflects laws and regulations issued to date pursuant to the provisions of the Texas Local Fire Fighters' Retirement Act (TLFFRA) and Vernon's Texas Civil Statutes, as well as applicable federal laws and regulations. In our opinion, the assumptions used in the valuation represent reasonable expectations of anticipated plan experience.

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 Plan liabilities. Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including: changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations. Due to the limited scope of the valuation, we did not perform an analysis of the potential range of such future measurements.

In conducting the valuation, we have relied on census data and asset information supplied by the Plan Administrator, 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.

Additionally, 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 that apply the funding rules to generate the results. All internally developed models are reviewed as part of the valuation process. As a result of this review, we believe that the models have produced reasonable results. We do not believe there are any material inconsistencies among assumptions or unreasonable output produced due to the aggregation of assumptions.

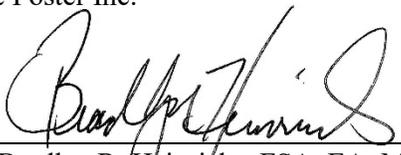
The undersigned are familiar with the immediate and long-term aspects of pension valuations, and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All of the sections of this report are considered an integral part of the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

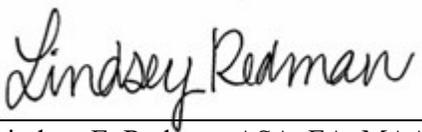
To our knowledge, no associate of Foster & Foster Inc. working on valuations of the program has any direct financial interest or indirect material interest in the City of Midland, nor does anyone at Foster & Foster Inc. act as a member of the Board of Trustees of the Midland Firemen's Relief and Retirement 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 239-433-5500.

Respectfully submitted,

Foster & Foster Inc.

By: 
Bradley R. Heinrichs, FSA, EA, MAAA
Enrolled Actuary #23-6901

By: 
Lindsey E. Redman, ASA, EA, MAAA
Enrolled Actuary #23-9001

BRH/lke

Enclosures

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SUMMARY OF REPORT

The actuarial valuation of the Midland Firemen's Relief and Retirement Fund, performed as of December 31, 2023, has been completed and the results are presented in this Report. The pension costs, compared with those developed in the December 31, 2021 actuarial valuation (as performed by Rudd and Wisdom, Inc.), are as follows:

<u>Valuation Date</u>	New Assump/Benefits <u>12/31/2023</u>	Old Assump/Benefits <u>12/31/2023</u>	<u>12/31/2021</u>
Current Normal Cost Rate % of Covered Annual Payroll ¹	27.83%	31.24%	31.54%
Funding Measurements			
Actuarial Accrued Liability (AAL)	206,257,442	219,047,225	200,776,937
Actuarial Value of Assets (AVA)	91,532,016	91,532,016	91,653,825
Unfunded Actuarial Accrued Liability (UAAL = AAL - AVA)	114,725,426	127,515,209	109,123,112
Funded Ratio (AVA / AAL)	44.4%	41.8%	45.6%
Amortization Period ²	Infinite years	Infinite years	Infinite years
Contributions			
Expected City Contribution Rate	24.20%	22.20%	22.20%
Expected Member Contribution Rate	14.20%	14.20%	14.20%
Total Expected Contribution Rate	38.40%	36.40%	36.40%
Funding Cost			
City 25-Year Funding Cost	46.38%	48.49%	48.50%
City 30-Year Funding Cost ^{2,3}	43.17%	45.40%	45.50%

¹ The Normal Cost Rate reflects an additional 1.70 % of payroll to account for administrative expenses paid by fund assets.

² The Texas Pension Review Board Pension Funding Guidelines, effective June 30, 2017, state that plans with amortization periods that exceed 30 years as of June 30, 2017 should seek to reduce their amortization period to 30 years or less as soon as practicable, but not later than June 30, 2025.

³ Per Section 802.101(a) of the Texas Government Code, the actuarial valuation must include a recommended contribution rate needed for the system to achieve and maintain an amortization period that does not exceed 30 years.

Additional Analysis Regarding Unfunded Actuarial Accrued Liability

As shown on the previous page, the UAAL as of December 31, 2023 is about \$114.7 million, and the plan is 44.4% funded on an Actuarial Asset basis. The table below shows the results from our analysis showing different funding scenarios in which the resulting amortization period would be 25 years as of December 31, 2023.

Funding Scenario	New Assumptions/Benefits	Old Assumptions/Benefits
Lump sum contributed to Fund January 1, 2025	Lump Sum: \$86.4M City Cont Rate: 24.20%	Lump Sum: \$118.8M City Cont Rate: 22.20%
\$47 million lump sum contributed to Fund plus City contribution rate increase January 1, 2025	Lump Sum: \$47.0M City Cont Rate: 35.43%	Lump Sum: \$47.0M City Cont Rate: 39.87%
City contribution rate increase January 1, 2025	Lump Sum: \$0.0M City Cont Rate: 48.83%	Lump Sum: \$0.0M City Cont Rate: 51.44%

As you can see based on the above results, significant changes need to occur in the near future for the Fund to achieve an amortization period within the preferred target range of 10 to 15 years, as stated in the PRB Pension Funding Guidelines. We would be happy to work with the City and/or Board to determine additional options to assist the Fund in improving its financial health.

CHANGES SINCE PRIOR VALUATION

Benefit/Fund Changes

The following benefit changes became effective January 1, 2024:

- The definition of Compensation excludes unscheduled overtime pay, except for members who are eligible for Service Retirement prior to January 1, 2026.
- Highest 60-Month Average Salary is equal to average Compensation for the highest 60 consecutive calendar months of service.

Additionally, the City contribution rate increased from 22.20% of payroll to 24.20% of payroll effective January 1, 2024.

Actuarial Assumption/Method Changes

The valuation reflects an update to use the most recently published mortality improvement scale by the Society of Actuaries (MP-2021). The valuation also reflects a change to the assumed total annual payroll for the year immediately following the valuation date.

There were no method changes since the prior valuation.

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	New Assump/Benefits <u>12/31/2023</u>	Old Assump/Benefits <u>12/31/2023</u>	<u>12/31/2021</u>
A. Participant Data			
Actives	249	249	230
Service Retirees + DROP	152	152	143
Beneficiaries + Alt Payees	45	45	39
Disability Retirees	4	4	4
Terminated Vested	10	10	7
	<hr/>	<hr/>	<hr/>
Total	460	460	423
Total Annual Payroll	21,982,249	25,446,296	22,052,445
Payroll Under Assumed Ret. Age	20,170,085	23,403,086	20,179,172
Annual Rate of Payments to:			
Service Retirees + DROP	8,778,424	8,778,424	7,988,028
Beneficiaries + Alt Payees	1,021,051	1,021,051	893,964
Disability Retirees	157,285	157,285	163,284
Terminated Vested	171,277	171,277	191,256
B. Assets			
Actuarial Value (AVA)	91,532,016	91,532,016	91,653,825
Market Value (MVA)	83,723,856	83,723,856	93,771,847
C. Liabilities			
Present Value of Benefits			
Actives			
Retirement + Termination Benefits	146,391,484	178,503,205	N/A
Death Benefits	1,236,961	1,548,933	N/A
Disability Benefits	4,263,489	5,380,989	N/A
Service Retirees + DROP	102,675,558	102,910,675	N/A
Beneficiaries + Alt Payees	9,871,176	9,883,557	N/A
Disability Retirees	1,902,389	1,906,091	N/A
Terminated Vested	1,714,886	1,715,902	N/A
	<hr/>	<hr/>	<hr/>
Total	268,055,943	301,849,352	270,762,815

	New Assump/Benefits <u>12/31/2023</u>	Old Assump/Benefits <u>12/31/2023</u>	<u>12/31/2021</u>
C. Liabilities - (Continued)			
Present Value of Future Salaries	227,690,207	270,682,070	N/A
Normal Cost (Entry Age Normal)			
Retirement + Termination Benefits	5,243,126	6,864,065	N/A
Death Benefits	82,155	105,011	N/A
Disability Benefits	224,980	294,369	N/A
Total Normal Cost	<u>5,550,261</u>	<u>7,263,445</u>	<u>N/A</u>
Present Value of Future Normal Costs	61,798,501	82,802,127	69,985,878
Actuarial Accrued Liability			
Retirement + Termination Benefits	88,024,531	100,275,729	N/A
Death Benefits	304,353	329,043	N/A
Disability Benefits	1,764,549	2,026,228	N/A
Inactives	116,164,009	116,416,225	106,761,734
Total Actuarial Accrued Liability (AAL)	<u>206,257,442</u>	<u>219,047,225</u>	<u>200,776,937</u>
Unfunded Actuarial Accrued Liability (UAAL)	114,725,426	127,515,209	109,123,112
Funded Ratio (AVA / AAL)	44.4%	41.8%	45.6%

COMPARISON OF CONTRIBUTION RATES TO
ACTUARIALLY DETERMINED CONTRIBUTION BENCHMARK

Pursuant to the Funding Policy, an Actuarially Determined Contribution (ADC) benchmark has been created for comparative purposes only and was constructed under the actuarial assumptions and methods identical to those disclosed in this report, except as follows:

Amortization Payment – The amortization payment will be calculated using a closed-period amortization method with a 30-year closed-period amortization established December 31, 2019. As of December 31, 2023, the amortization payment is determined using a 26-year amortization period.

ADC Benchmark – The ADC benchmark is the sum of the Normal Cost Rate and the UAAL Amortization Payment as a percentage of payroll.

<u>Valuation as of December 31, ¹</u>	<u>City of Midland Contribution Rate ²</u>	<u>City ADC Benchmark</u>	<u>City Contribution Excess/(Shortfall)</u>
2023	24.20%	45.75%	(21.55%)
2021	22.20%	46.55%	(24.35%)
2019	22.20%	37.40%	(15.20%)

¹ Results for December 31, 2019 and December 31, 2021 reflect Rudd and Wisdom calculations.

² City of Midland contribution rate increased to 24.20% effective January 1, 2024.

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2022

<u>ASSETS</u>	MARKET VALUE
Cash and Cash Equivalents:	
Cash and cash equivalents	13,657,931.00
Total Cash and Equivalents	13,657,931.00
Receivables:	
Accrued interest and declared dividends	73,944.00
Total Receivable	73,944.00
Investments:	
Domestic equities	13,839,877.00
Foreign bonds	130,236.00
Corporate bonds	9,378,271.00
Mutual funds	1,595,463.00
Real estate	11,437,392.00
Venture capital funds	18,378,531.00
International equities	13,912,022.00
Total Investments	68,671,792.00
Total Assets	82,403,667.00
<u>LIABILITIES</u>	
Payables:	
Accounts payable	96,229.00
DROP payable	1,019,468.00
QDRO payable	308,532.00
Total Liabilities	1,424,229.00
NET POSITION RESTRICTED FOR PENSIONS	80,979,438.00

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

ADDITIONS

Contributions:

Member	3,326,782.00
City	5,201,025.00

Total Contributions 8,527,807.00

Investment Income:

Net Increase in Fair Value of Investments	(11,248,985.00)
Interest & Dividends	1,692,765.00
Less Investment Expense ¹	(500,264.00)

Net Investment Income (10,056,484.00)

Other cash receipts 389.00

Total Additions (1,528,288.00)

DEDUCTIONS

Distributions to Members:

Benefits paid including refunds of contributions	10,875,344.00
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Total Distributions 10,875,344.00

Administrative Expense 388,777.00

Total Deductions 11,264,121.00

Net Increase in Net Position (12,792,409.00)

NET POSITION RESTRICTED FOR PENSIONS

Beginning of the Year 93,771,847.00

End of the Year 80,979,438.00

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

ACTUARIAL ASSET VALUATION
December 31, 2022

Actuarial Assets for funding purposes are developed by recognizing the total actuarial investment gain or loss for each Plan Year over a five year period. In the first year, 20% of the gain or loss is recognized. In the second year 40%, in the third year 60%, in the fourth year 80%, and in the fifth year 100% of the gain or loss is recognized. The actuarial investment gain or loss is defined as the actual return on investments minus the actuarial assumed investment return. Actuarial Assets shall not be less than 80% nor greater than 120% of Market Value of Assets.

Plan Year Ending	Gain/(Loss)	<u>Gains/Losses Not Yet Recognized</u>				
		Amounts Not Yet Recognized by Valuation Year				
		2023	2024	2025	2026	2027
12/31/2018	(13,996,378)	0	0	0	0	0
12/31/2019	2,066,496	413,300	0	0	0	0
12/31/2020	(1,407,443)	(562,976)	(281,487)	0	0	0
12/31/2021	6,168,958	3,701,374	2,467,582	1,233,790	0	0
12/31/2022	(16,524,756)	(13,219,805)	(9,914,854)	(6,609,903)	(3,304,952)	0
Total		(9,668,107)	(7,728,759)	(5,376,113)	(3,304,952)	0

<u>Development of Investment Gain/Loss</u>	
Market Value of Assets, 12/31/2021	93,771,847
Contributions Less Benefit Payments & Admin Expenses	(2,735,925)
Expected Investment Earnings*	6,468,272
Actual Net Investment Earnings	(10,056,484)
2023 Actuarial Investment Gain/(Loss)	<u>(16,524,756)</u>

*Expected Investment Earnings = 0.07 * (93,771,847 - 0.5 * 2,735,925)

<u>Development of Actuarial Value of Assets</u>	
(1) Market Value of Assets, 12/31/2022	80,979,438
(2) Gains/(Losses) Not Yet Recognized	<u>(9,668,107)</u>
(3) Actuarial Value of Assets, 12/31/2022, (1) - (2)	90,647,545
(4) Limited Actuarial Value of Assets, 12/31/2022	90,647,545
(A) 12/31/2021 Actuarial Assets:	91,653,825
(I) Net Investment Income:	
1. Interest and Dividends	1,692,765
2. Net Increase in Fair Value of Investments	(11,248,985)
3. Change in Actuarial Value	11,786,129
4. Investment Expenses	<u>(500,264)</u>
Total	1,729,645
(B) 12/31/2022 Actuarial Assets:	90,647,545
Actuarial Assets Rate of Return = 2I/(A+B-I):	1.92%
Market Value of Assets Rate of Return:	-10.88%

Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis) (4,590,365)

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

REVENUES		
Contributions:		
Member	3,326,782.00	
City	5,201,025.00	
Total Contributions		8,527,807.00
Earnings from Investments:		
Interest & Dividends	1,692,765.00	
Net Increase in Fair Value of Investments	(11,248,985.00)	
Change in Actuarial Value	11,786,129.00	
Total Earnings and Investment Gains		2,229,909.00
Other cash receipts		389.00
EXPENDITURES		
Distributions to Members:		
Benefits paid including refunds of contributions	10,875,344.00	
Total Distributions		10,875,344.00
Expenses:		
Investment related ¹	500,264.00	
Administrative	388,777.00	
Total Expenses		889,041.00
Change in Net Assets for the Year		(1,006,280.00)
Net Assets Beginning of the Year		91,653,825.00
Net Assets End of the Year ²		90,647,545.00

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

²Net Assets may be limited for actuarial consideration.

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2023

<u>ASSETS</u>	MARKET VALUE
Cash and Cash Equivalents:	
Cash and cash equivalents	8,172,539.00
Total Cash and Equivalents	8,172,539.00
Receivables:	
Accrued interest and declared dividends	54,977.00
Total Receivable	54,977.00
Investments:	
Domestic equities	21,425,512.00
Mutual funds	15,911,076.00
Real estate	9,062,370.00
Venture capital funds	17,439,338.00
International equities	12,589,330.00
Total Investments	76,427,626.00
Total Assets	84,655,142.00
<u>LIABILITIES</u>	
Payables:	
Accounts payable	121,204.00
DROP payable	726,358.00
QDRO payable	83,724.00
Total Liabilities	931,286.00
NET POSITION RESTRICTED FOR PENSIONS	83,723,856.00

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
FOR THE YEAR ENDED DECEMBER 31, 2023
Market Value Basis

ADDITIONS

Contributions:

Member	3,569,340.00
City	5,580,525.00

Total Contributions	9,149,865.00
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Investment Income:

Net Increase in Fair Value of Investments	3,498,678.00
Interest & Dividends	2,663,869.00
Less Investment Expense ¹	(688,765.00)

Net Investment Income	5,473,782.00
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Other cash receipts	254.00
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Total Additions	14,623,901.00
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DEDUCTIONS

Distributions to Members:

Benefits paid including refunds of contributions	11,521,514.00
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Total Distributions	11,521,514.00
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Administrative Expense	357,969.00
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Total Deductions	11,879,483.00
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Net Increase in Net Position	2,744,418.00
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NET POSITION RESTRICTED FOR PENSIONS

Beginning of the Year	80,979,438.00
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End of the Year	83,723,856.00
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¹Investment related expenses include investment advisory, custodial and performance monitoring fees.

ACTUARIAL ASSET VALUATION
December 31, 2023

Actuarial Assets for funding purposes are developed by recognizing the total actuarial investment gain or loss for each Plan Year over a five year period. In the first year, 20% of the gain or loss is recognized. In the second year 40%, in the third year 60%, in the fourth year 80%, and in the fifth year 100% of the gain or loss is recognized. The actuarial investment gain or loss is defined as the actual return on investments minus the actuarial assumed investment return. Actuarial Assets shall not be less than 80% nor greater than 120% of Market Value of Assets.

Plan Year Ending	Gain/(Loss)	<u>Gains/Losses Not Yet Recognized</u>				
		Amounts Not Yet Recognized by Valuation Year				
		2024	2025	2026	2027	2028
12/31/2019	2,066,496	0	0	0	0	0
12/31/2020	(1,407,443)	(281,487)	0	0	0	0
12/31/2021	6,168,958	2,467,582	1,233,790	0	0	0
12/31/2022	(16,524,756)	(9,914,854)	(6,609,903)	(3,304,952)	0	0
12/31/2023	(99,251)	(79,401)	(59,551)	(39,701)	(19,851)	0
Total		(7,808,160)	(5,435,664)	(3,344,653)	(19,851)	0

<u>Development of Investment Gain/Loss</u>	
Market Value of Assets, 12/31/2022	80,979,438
Contributions Less Benefit Payments & Admin Expenses	(2,729,364)
Expected Investment Earnings*	5,573,033
Actual Net Investment Earnings	5,473,782
2024 Actuarial Investment Gain/(Loss)	<u>(99,251)</u>

*Expected Investment Earnings = $0.07 * (80,979,438 - 0.5 * 2,729,364)$

<u>Development of Actuarial Value of Assets</u>	
(1) Market Value of Assets, 12/31/2023	83,723,856
(2) Gains/(Losses) Not Yet Recognized	<u>(7,808,160)</u>
(3) Actuarial Value of Assets, 12/31/2023, (1) - (2)	91,532,016
(4) Limited Actuarial Value of Assets, 12/31/2023	91,532,016
 (A) 12/31/2022 Actuarial Assets:	 90,647,545
 (I) Net Investment Income:	
1. Interest and Dividends	2,663,869
2. Net Increase in Fair Value of Investments	3,498,678
3. Change in Actuarial Value	(1,859,947)
4. Investment Expenses	<u>(688,765)</u>
Total	3,613,835
 (B) 12/31/2023 Actuarial Assets:	 91,532,016
 Actuarial Assets Rate of Return = $2I/(A+B-I)$:	 4.05%
Market Value of Assets Rate of Return:	6.88%

Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis) (2,635,965)

CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS
 DECEMBER 31, 2023
 Actuarial Asset Basis

REVENUES

Contributions:		
Member	3,569,340.00	
City	5,580,525.00	
Total Contributions		9,149,865.00
Earnings from Investments:		
Interest & Dividends	2,663,869.00	
Net Increase in Fair Value of Investments	3,498,678.00	
Change in Actuarial Value	(1,859,947.00)	
Total Earnings and Investment Gains		4,302,600.00
Other cash receipts		254.00

EXPENDITURES

Distributions to Members:		
Benefits paid including refunds of contributions	11,521,514.00	
Total Distributions		11,521,514.00
Expenses:		
Investment related ¹	688,765.00	
Administrative	357,969.00	
Total Expenses		1,046,734.00
Change in Net Assets for the Year		884,471.00
Net Assets Beginning of the Year		90,647,545.00
Net Assets End of the Year ²		91,532,016.00

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

²Net Assets may be limited for actuarial consideration.

STATISTICAL DATA ¹

	<u>12/31/2017</u>	<u>12/31/2019</u>	<u>12/31/2021</u>	<u>12/31/2023</u>
<u>Actives</u>				
Number	207	227	230	249
Average Current Age	37.5	35.9	36.1	35.8
Average Age at Employment	26.5	26.2	26.5	26.6
Average Past Service	11.0	9.7	9.6	9.2
Average Annual Salary	\$78,555	\$88,513	\$95,880	\$88,282
<u>Service Retirees + DROP</u>				
Number				152
Average Current Age				66.8
Average Annual Benefit				\$57,753
<u>Beneficiaries + Alt Payees</u>				
Number				44
Average Current Age ²				70.9
Average Annual Benefit				\$23,206
<u>Disability Retirees</u>				
Number				4
Average Current Age				61.9
Average Annual Benefit				\$39,321
<u>Terminated Vested</u>				
Number				10
Average Current Age ³				45.1
Average Annual Benefit ³				\$28,546

¹ Results prior to December 31, 2023 are from previous actuarial valuations performed by Rudd and Wisdom.

² Excludes child beneficiaries.

³ Average Current Age and 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

ATTAINED AGE	PAST SERVICE											TOTAL	
	0-1	2-9	10-14	15-19	20	21	22	23	24	25-29	30+		
15 - 19	1	0	0	0	0	0	0	0	0	0	0	0	1
20 - 24	16	5	0	0	0	0	0	0	0	0	0	0	21
25 - 29	19	30	0	0	0	0	0	0	0	0	0	0	49
30 - 34	14	34	2	0	0	0	0	0	0	0	0	0	50
35 - 39	8	24	9	6	0	0	0	0	0	0	0	0	47
40 - 44	0	8	9	19	2	0	0	0	0	0	0	0	38
45 - 49	1	2	1	5	1	1	2	4	3	3	3	0	23
50 - 54	0	0	0	4	0	0	1	1	0	7	7	0	13
55 - 59	0	0	0	0	0	0	0	0	0	2	2	1	3
60 - 64	0	0	1	0	0	0	0	0	0	1	1	2	4
65+	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	59	103	22	34	3	1	3	5	3	13	3	3	249

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 12/31/2021	230
b. Terminations	
i. Vested (partial or full) with deferred benefits	(1)
ii. Non-vested or full lump sum distribution received	(27)
iii. Non-vested awaiting lump sum distribution	(2)
c. Deaths	
i. Beneficiary receiving benefits	(1)
ii. No future benefits payable	0
d. Disabled	0
e. Retired	<u>(9)</u>
f. Continuing participants	190
g. New entrants	<u>59</u>
h. Total active life participants in valuation	249

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

	Service Retirees, DROP Receiving <u>Benefits</u>	Receiving Death <u>Benefits</u>	Receiving Disability <u>Benefits</u>	Receiving QDRO <u>Benefits</u>	Vested <u>Deferred</u> ¹	<u>Total</u>
a. Number prior valuation	143	39	4	7	7	200
Retired	11	0	0	0	(2)	9
Vested Deferred	0	0	0	0	3	3
Death, With Survivor	(1)	4	0	0	0	3
Death, No Survivor	(2)	(6)	0	0	0	(8)
Disabled	0	0	0	0	0	0
Refund of Contributions	0	0	0	0	0	0
Rehires	0	0	0	0	0	0
Expired Annuities	0	0	0	0	0	0
Data Corrections	1	1	0	0	0	2
Hired/Termed in Same Year	0	0	0	0	2	2
b. Number current valuation	152	38	4	7	10	211

¹ Includes 4 nonvested terminated members who have not yet received a refund of member contributions as of December 31, 2023.

ACTUARIAL ASSUMPTIONS AND METHODS

Assumption Rationale

Unless otherwise noted below, assumptions and methods reflect those utilized in the December 31, 2021 valuation performed by Rudd and Wisdom.

Mortality Rates

Active Lives:

PubS-2010 Mortality Table for Employees.

Retiree and Vested Terminated Lives:

PubS-2010 Mortality Table for Healthy Retirees.

Contingent Survivor Lives:

PubS-2010 Mortality Table for Contingent Survivors.

Disabled Lives:

PubS-2010 Mortality Table for Disabled Retirees.

The mortality assumptions for all participants are sex distinct with mortality improvement projected generationally beyond the valuation date using scale MP-2021 (previously MP-2019) and a base year of 2010. We feel these assumptions sufficiently accommodate anticipated future mortality improvements.

Interest Rate

7.00% per year, compounded annually, net of investment-related expenses.

Retirement Age

<u>Age</u>	<u>Rate</u>
50	30%
51-52	10
53	40
54-55	25
56-59	50
60	100

Termination Rates

Sample rates are displayed below.

<u>Service</u>	<u>Rate</u>
0	11.9%
1	10.7
2	9.5
5	6.3
10	3.3
15-16	1.8
17	1.6
18-19	1.5
20+	0.0

Disability Rates

Sample rates are displayed below.

<u>Age</u>	<u>Rate</u>
25	0.019%
35	0.052%
45	0.209%
55	0.000%

Salary Increases

<u>Service</u>	<u>Increase</u>
<4	15.88%
4-20	6.09
21+	3.00

The rates above include a general compensation increase of 3.00% per year.

Valuation Payroll

Retirement eligible members before January 1, 2026:
Payroll is assumed to be actual (or annualized) compensation from the previous calendar year.

All other members:
Payroll is assumed to be actual compensation from the previous calendar year less overtime pay and adjusted using the salary increase assumption.

Previously, valuation payroll was assumed to be equal to actual (or annualized) compensation from the previous calendar year.

Payroll Growth

3.00% per year for amortization of the Unfunded Actuarial Accrued Liability.

Funding Method

Entry Age Normal Actuarial Cost Method

Contribution Rates

Members – 14.20%
City – 24.20%

Administrative Expenses

1.7% of payroll annually and is reflected in the normal cost rate as a percentage of payroll.

Marital Status

90% of actives are assumed to be married at time of benefit commencement. Males are assumed to be three years older than their spouses.

Dependent Children

None assumed.

Payment Form

Married – Joint & 75% to survivor
Single – Life annuity

DROP Elections

Reverse DROP: 100% of eligible retiring members are assumed to elect Reverse DROP if the member is not eligible to elect at least a 24-month lump sum under Retroactive DROP.

Retroactive DROP: 100% of eligible retiring members are assumed to elect Retroactive DROP if the member is eligible to elect at least a 24-month lump sum (assume maximum DROP period possible, not to exceed 3 years).

Actuarial Asset Method

All assets are valued at market value with an adjustment made to uniformly spread actuarial investment gains and losses (as measured by actual market value investment return against expected market value investment return) over a five-year period.

Low-Default-Risk Obligation Measure

Based on the Entry Age Normal Actuarial Cost Method and an interest rate of 4.00% per year compounded annually, net of investment related expenses. This rate is consistent with the Yield to Maturity of the S&P Municipal Bond 20-Year High Grade Rate Index as of December 31, 2023. All other assumptions for the Low-Default-Risk Obligation Measure are consistent with the assumptions shown in this section unless otherwise noted.

SUMMARY OF BENEFIT PROVISIONS

<u>Credited Service</u>	Period of continuous employment covered by the Fund during which a member pays into, and keeps on deposit in the Fund, the contributions required by the Fund. Credited Service will be calculated in completed months.
<u>Compensation</u>	<p>Total pay including regular, longevity and overtime compensation and compensation received during a period of sick leave or vacation/holiday leave, but excluding lump sum distributions for unused sick leave or vacation/holiday leave.</p> <p>Effective January 1, 2024, the definition of compensation excludes overtime pay, except for members who are eligible to retire prior to January 1, 2026.</p>
<u>Average Salary</u>	<p>Highest 60-Month Average Salary is equal to the average total pay for the 60 calendar months of service in which total pay is highest.</p> <p>Effective January 1, 2024, Highest 60-Month Average Salary is equal to the average Compensation for the highest 60 consecutive calendar months of service.</p>
<u>Member Contributions</u>	14.20% of Compensation.
<u>Service Retirement</u>	
Date	The earlier of age 50 and 20 years of Credited Service, or 25 years of Credited Service, regardless of age.
Benefit	75% of Average Salary <u>plus</u> a longevity benefit equal to \$80 per month for each year of Credited Service in excess of 20 years.
Form of Benefit	Joint and 75% to Surviving Spouse.
<u>Early Retirement</u>	
Date	Attainment of age 45 and 20 years of Credited Service.
Benefit	Equal to the Service Retirement as shown above multiplied by an actuarial reduction factor based on age at time of commencement.

Supplemental Retirement Benefit

Eligibility Attainment of age 50 and 20 years of Credited Service.

Benefit \$500 per month payable for life of the member with 75% continued to the Surviving Spouse for her lifetime.

Cost-of-Living Adjustment

Effective September 1, 1998, current and future retired firefighters and beneficiaries will receive an automatic 2% cost-of-living adjustment after having received benefits for 5 years, provided the Fund's investment performance does not fall below a 5-year average of 8.25%.

The cost-of-living adjustment is payable on August 1 following the fifth year of receipt of benefits by a firefighter and following physical departure from the Fire Department. DROP participation does not constitute time toward the 5-year requirement.

The cost-of-living adjustment is not applicable to the Supplemental Retirement benefit, or any payment to an alternate payee under a QDRO.

Termination Benefits

Members with < 10 years of Credited Service: Refund of member contributions, without interest.

Members with 10+ years of Credited Service: Accrued benefit as described in the Service Retirement section, payable at the Service Retirement age requirement. For members who terminate with less than 20 years of Credited Service, the accrued benefit will be multiplied by the vested percentage (50% vested percentage at 10 years of Credited Service, increasing 5% each additional year).

Disability

A member who qualifies for a disability retirement benefit will receive a monthly retirement income equal to 75% of Average Salary plus a longevity benefit equal to \$80 per month for each year of Credited Service in excess of 20 years.

Death Benefits

Surviving Spouse of Member: 75% of the member's accrued benefit, as described under the Service Retirement benefit provision.

Dependent Children of Member: Each unmarried child is entitled to 11.25% of the member's Average Salary, payable until age 22. If there is not a surviving spouse receiving a benefit, each child is entitled to 22.50% of the member's Average Salary.

Lump Sum Death Benefit A \$10,000 lump sum death benefit is paid to the designated beneficiary of an active member or service retiree.

Deferred Retirement Option Program

Option 1 (Forward DROP)

Eligibility	Satisfaction of Service Retirement requirements.
Participation Period	Not to exceed 36 months.
Accumulation	Sum of the monthly Service Retirement benefit the member would have received if had retired on the DROP election date (with 4.0% annual interest crediting) plus an amount equal to the member contributions to the fund while a DROP participant.

Option 2 (Reverse DROP)

Eligibility	Satisfaction of Service Retirement requirements.
Benefit	Under the Reverse DROP, a member may elect to receive 90% of his regular monthly benefit and a lump sum equal to twenty-four times the reduced benefit.

Option 3 (Retroactive DROP)

Eligibility	Satisfaction of Service Retirement requirements.
Participation Period	Not to exceed 36 months.
Accumulation	Sum of the monthly Service Retirement benefit the member would have received if had retired on the Retroactive DROP election date plus an amount equal to the member contributions to the fund made between the Retroactive DROP election date and actual retirement date. Interest is credited annually at 4.0%.

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 actuarial assumptions. 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 impacts the plan's amortization period. 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 amortization period. When assumptions are too optimistic, losses can accumulate over time and the plan's amortization period 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, amortization periods 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 period can increase significantly even if all assumptions other than the payroll growth assumption are realized since anticipated contributions rely upon membership payroll.
- 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.
- Amortization Period: Risks associated with the items outlined above will inherently create varying liabilities and assets resulting in volatility in the amortization period. Actuarial losses on assets and liabilities will lead to longer amortization periods, while actuarial gains on assets and liabilities will lead to shorter amortization periods.

- Contribution Risk: This risk results from the potential that the total annual contributions, based on fixed-rates for the City and membership, may deviate from actuarially determined contributions, as illustrated on page 5. The actuarially determined contributions are adjusted in conjunction with each actuarial valuation to take into account the deviation in actual versus expected experience between valuation dates. Fixed-rate contribution structures include the risk that scheduled contributions do not reflect the actual cost of plan benefits, meaning that in order to maintain actuarially sound funding levels, contribution rate increases or benefit reductions may be required.

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 among 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 the risk characteristics and risk tolerance of the plan. For example, plans with a large amount of liability attributable to retirees have a shorter time horizon to recover from losses (such as investment experience losses due to lower than expected investment returns) than plans where the majority of the liability is attributable to active members. For this reason, highly mature plans with a substantial liability due to retirees and inactive members have less tolerance for risk. Similarly, mature plans paying substantial retirement benefits resulting in a small positive or negative net 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 and assessing risk, we have provided some relevant metrics in the section titled “Plan Maturity Measures and Other Risk Metrics”. Highlights of this information are discussed below:

- The Support Ratio, determined as the ratio of active to inactive members has stayed about the same over the last four valuations, indicating that the plan's maturity level has not significantly changed during the period.
- The Accrued Liability Ratio, determined as the ratio of the Inactive Accrued Liability, which is the liability associated with members who are no longer employed but are due a benefit from the plan, to the Total Accrued Liability, is 56.3%. 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 decreased from 60.9% to 44.4% over the last four valuations.
- 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, is -3.3%. This indicates that contributions are not currently covering the plan's benefit payments and administrative expenses.

Low Default-Risk Obligation Measure

ASOP No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions, was revised as of December 2021 to include a “low-default-risk obligation measure” (LDROM). This liability measure is consistent with the determination of the actuarial accrued liability shown on page 9 in terms of member data, plan provisions, and assumptions/methods, under the Entry Age Normal Cost Method, except that the interest rate is tied to low-default-risk fixed income securities. The S&P Municipal Bond 20 Year High Grade Rate Index (daily rate closest to, but not later than, the measurement date) was selected to represent a current market rate of low risk but longer-term investments that could be included in a low-risk asset portfolio. The interest rate used in this valuation was 4.00%, resulting in an LDROM of \$301,899,167. The LDROM should not be considered the “correct” liability measurement; it simply shows a possible outcome if the Board elected to hold a very low risk asset portfolio. The Board actually invests the pension plan’s contributions in a diversified portfolio of stocks and bonds and other investments with the objective of maximizing investment returns at a reasonable level of risk. Consequently, the difference between the plan’s Actuarial Accrued Liability disclosed earlier in this section and the LDROM can be thought of as representing the expected taxpayer savings from investing in the plan’s diversified portfolio compared to investing only in high quality bonds.

The actuarial valuation reports the funded status based on the expected return of the plan’s investment portfolio. If instead, the plan switched to investing exclusively in high quality bonds, the LDROM illustrates that reported funded status would be lower (which also implies that contribution rates would need to be increased), perhaps significantly. Unnecessarily high contribution rates in the near term may not be affordable and could imperil plan sustainability and benefit security.

It is important to note that we have identified the risks above as the most significant risks based on the characteristics of the plan and the nature of the actuarial valuation, however, it is not an exhaustive list of potential risks that could be considered. Advanced modelling, as well as the identification of additional risks, can be helpful and can be provided upon request of the Board.

PLAN MATURITY MEASURES AND OTHER RISK METRICS ¹

	<u>12/31/2017</u>	<u>12/31/2019</u>	<u>12/31/2021</u>	<u>12/31/2023</u>
<u>Support Ratio</u>				
Total Actives	207	227	230	249
Total Inactives	177	193	200	210
Actives / Inactives	116.9%	117.6%	115.0%	118.6%
<u>Accrued Liability (AL) Ratio</u>				
Inactive Accrued Liability	74,208,569	91,672,314	106,761,734	116,164,009
Total Accrued Liability	150,809,141	177,602,061	200,776,937	206,257,442
Inactive AL / Total AL	49.2%	51.6%	53.2%	56.3%
<u>Funded Ratio</u>				
Actuarial Value of Assets (AVA)	91,856,742	90,753,400	91,653,825	91,532,016
Total Accrued Liability	150,809,141	177,602,061	200,776,937	206,257,442
AVA / Total Accrued Liability	60.9%	51.1%	45.6%	44.4%
<u>Net Cash Flow Ratio</u>				
Net Cash Flow ²	(2,862,966)	(2,913,555)	(5,029,704)	(2,729,618)
Market Value of Assets (MVA)	89,754,731	84,848,966	93,771,847	83,723,856
Ratio	-3.2%	-3.4%	-5.4%	-3.3%

¹ Results prior to December 31, 2023 are from previous actuarial valuations performed by Rudd and Wisdom.

² Determined as total contributions minus benefit payments and administrative expenses for the 12 months preceding the valuation date.

VALUATION NOTES

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 (see below), with adjustments according to the plan's 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.

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.

Total Annual Payroll is the projected annual rate of pay for the year beginning on the valuation date of all covered Members.

Payroll under Assumed Retirement Age is the projected annual rate of pay for the year beginning on the valuation date of all active participants who are not subject to a 100% probability of retirement on the valuation date.

Present Value of Benefits is the single sum value on the valuation date of all future benefits to be paid to current Members, Retirees, Beneficiaries, Disability Retirees and Vested Terminations.

Normal (Current Year's) Cost is determined for each participant as the present value of future benefits, determined as of the Member's entry age, amortized as a level percentage of compensation over the anticipated number of years of participation, determined as of the entry age.

Individual Entry Age Normal Actuarial Cost Method (Level Percent of Compensation) is the method used to determine required contributions under the Fund. The use of this method involves the systematic funding of the Normal Cost (described above) and the Unfunded Accrued (Past Service) Liability. The actuarial accrued liability for active participants is the difference between the present value of future benefits and the present value of future Normal Costs. The actuarial accrued liability for inactive participants is the present value of future benefits.

Unfunded Actuarial Accrued Liability (UAAL) is the difference between the actuarial accrued liability (described above) and the actuarial value of assets.