WICHITA FALLS FIREMEN'S
RELIEF AND RETIREMENT FUND

ACTUARIAL VALUATION
AS OF JANUARY 1, 2024

FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

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July 10, 2024

Board of Trustees
Wichita Falls Firemen's
Relief and Retirement Fund
624 Indiana Ave, Suite 305
Wichita Falls, TX 76301

Re: Wichita Falls Firemen's Relief and Retirement Fund

Dear Board:

We are pleased to present to the Board this report of the actuarial valuation of the Wichita Falls 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. Use of the results for other purposes may not be applicable and may produce significantly different results.

The valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board, and reflects laws and regulations issued to date pursuant to the provisions of 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, as adopted by the Board of Trustees, represent reasonable expectations of anticipated plan experience. Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including: changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations. Due to the limited scope of the valuation, we did not perform an analysis of the potential range of such future measurements.

In conducting the valuation, we have relied on personnel, plan design, financial reports, and asset information supplied by the Fund staff, and the actuarial assumptions and methods described in the Actuarial Assumptions section of this report. While we cannot verify the accuracy of all this information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy of the information and believe that it has produced appropriate results. This information, along with any adjustments or modifications, is summarized in various sections of this report.

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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 Wichita Falls, nor does anyone at Foster & Foster Inc. act as a member of the Board of Trustees of the Wichita Falls 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
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BRH/lke

Enclosures

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SUMMARY OF REPORT

The actuarial valuation of the Wichita Falls Firemen's Relief and Retirement Fund, performed as of January 1, 2024, has been completed and the results are presented in this Report. The pension costs, compared with those developed in the January 1, 2022 actuarial valuation, are as follows:

	New Assump	Old Assump	
Valuation Date	1/1/2024	1/1/2024	1/1/2022
Current Normal Cost Rate % of Covered Annual Payroll	13.49%	12.64%	13.71%
Funding Measurements			
Actuarial Accrued Liability (AAL)	104,973,583	102,663,450	95,923,750
Actuarial Value of Assets (AVA)	55,156,185	55,156,185	62,360,750
Unfunded Actuarial Accrued Liability (UAAL = AAL - AVA)	49,817,398	47,507,265	33,563,000
Funded Ratio (AVA / AAL)	52.5%	53.7%	65.0%
Amortization Period [1]	56.7 years	35.4 years	32.1 years
Contributions			
Expected City Contribution Rate	16.50%	16.18%	13.25%
Expected Member Contribution Rate	13.00%	13.00%	13.00%
Total Expected Contribution Rate	29.50%	29.18%	26.25%
Funding Costs			
City 20-Year Funding Cost	27.50%	23.94%	18.61%
City 30-Year Funding Cost [1,2]	21.48%	17.94%	13.86%
City 40-Year Funding Cost	18.69%	15.06%	11.54%

[1] 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.

[2] 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.

Plan experience was unfavorable overall on the basis of the plan's actuarial assumptions. Sources of unfavorable experience included an average investment return of -1.26% over the past two years which fell short of the 7.75% assumption and an average salary increase of 6.71% which exceeded the 5.18% assumption. These losses were offset in part by a gain associated with fewer retirements than expected.

CHANGES SINCE PRIOR VALUATION

Benefit/Fund Changes

The city contribution rate increased from 13.25% to 16.18% effective January 1, 2023 and increased from 16.18% to 16.50% effective January 1, 2024.

Actuarial Assumption/Method Changes

As a result of the actuarial experience study conducted in October 2022, the Board approved changes to the actuarial assumptions in conjunction with this valuation. The actuarial assumptions that were changed are listed below:

- Investment Return (lowered from 7.75% to 7.50%)
- Payroll Growth (lowered from 4.00% to 3.00%)
- Salary Increase Rates
- Retirement Rates
- Withdrawal Rates
- Disability Rates

There were no method changes since the prior valuation.

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	New Assump 1/1/2024	Old Assump 1/1/2024	1/1/2022
A. Participant Data			
Actives	157	157	160
Service Retirees + DROP	115	115	116
Beneficiaries + Alt Payees	31	31	31
Disability Retirees	1	1	0
Terminated Vested	4	4	3
Total	308	308	310
Covered Annual Payroll	13,552,165	13,583,002	12,538,296
Annual Rate of Payments to:			
Service Retirees + DROP	5,438,767	5,438,767	5,337,204
Beneficiaries + Alt Payees	520,870	520,870	475,873
Disability Retirees	37,270	37,270	0
Terminated Vested	156,693	156,693	110,018
B. Assets			
Actuarial Value (AVA)	55,156,185	55,156,185	62,360,750
Market Value (MVA)	55,156,185	55,156,185	62,360,750
C. Liabilities			
Present Value of Benefits			
Actives			
Retirement + Termination Benefits	56,592,433	53,718,388	48,949,258
Death Benefits	688,409	644,427	619,093
Disability Benefits	777,087	1,453,442	1,358,509
Service Retirees + DROP	56,760,918	55,630,895	55,456,498
Beneficiaries + Alt Payees	4,769,554	4,679,653	4,173,404
Disability Retirees	456,553	445,468	0
Terminated Vested	1,754,991	1,706,176	1,042,979
Total	121,799,945	118,278,449	111,599,741

	New Assump 1/1/2024	Old Assump 1/1/2024	1/1/2022
C. Liabilities - (Continued)			
Present Value of Future Salaries	132,320,104	129,634,962	123,348,065
Normal Cost (Entry Age Normal)			
Retirement + Termination Benefits	1,674,552	1,529,955	1,535,668
Death Benefits	47,542	45,585	44,750
Disability Benefits	40,627	77,005	74,385
Total Normal Cost	1,762,721	1,652,545	1,654,803
Present Value of Future Normal Costs	16,826,362	15,614,999	15,675,991
Actuarial Accrued Liability			
Retirement + Termination Benefits	40,654,111	39,318,363	34,461,022
Death Benefits	206,220	190,339	171,447
Disability Benefits	371,236	692,556	618,400
Inactives	63,742,016	62,462,192	60,672,881
Total Actuarial Accrued Liability (AAL)	104,973,583	102,663,450	95,923,750
Unfunded Actuarial Accrued Liability (UAAL)	49,817,398	47,507,265	33,563,000
Funded Ratio (AVA / AAL)	52.5%	53.7%	65.0%

	New Assump 1/1/2024	Old Assump 1/1/2024	1/1/2022
D. Actuarial Present Value of Accrued Benefits			
Inactives	63,742,016	62,462,192	60,672,881
Actives	31,722,602	31,176,419	27,087,872
Total Present Value Accrued Benefits (PVAB)	95,464,618	93,638,611	87,760,753
Funded Ratio (MVA / PVAB)	57.8%	58.9%	71.1%

GAIN/LOSS ANALYSIS

a. Total (Gain)/Loss

1.	Unfunded Actuarial Accrued Liability as of January 1, 2022	$33,563,000
2.	Normal Cost applicable for 2022	1,654,803
3.	Normal Cost applicable for 2023	1,752,436
4.	Interest on (1), (2), and (3)	5,612,203
5.	Contributions made during 2022	3,261,983
6.	Contributions made during 2023	3,804,972
7.	Interest on (5) and (6)	516,457
8.	Expected UAAL as of January 1, 2024: (1)+(2)+(3)+(4)-(5)-(6)-(7)	34,999,030
9.	Actual UAAL as of January 1, 2024 (Before Changes)	47,507,265
	Total Actuarial (Gain)/Loss	12,508,235

b. (Gain)/Loss on Assets

1.	Actuarial Value of Assets as of January 1, 2022	62,360,750
2.	Contributions Less Benefit Payments	(5,328,832)
3.	Expected Investment Earnings	8,580,292
4.	Expected AVA as of January 1, 2024: (1)+(2)+(3)	65,612,211
5.	Actual Actuarial Value of Assets as of January 1, 2024	55,156,185
	(Gain)/Loss on Assets	10,456,026

c. Gain/(Loss) on Liabilities

1.	Expected Actuarial Accrued Liability: a(8)+b(4)	100,611,241
2.	Actual Actuarial Accrued Liability (Before Changes)	102,663,450
	(Gain)/Loss on Liabilities	2,052,209

HISTORY OF GAIN/LOSS

Valuation as of January 1,	Actuarial (Gain)/Loss	(Gain)/Loss on Assets	(Gain)/Loss on Liabilities
2024	12,508,235	10,456,026	2,052,209
2022	(10,004,023)	(7,315,066)	(2,688,957)
2020	679,313	791,028	(111,715)
2018	2,742,279	246,023	2,496,256
2017	1,954,044	731,469	1,222,575
2016	664,011	759,444	(95,433)

COMPARISON OF CONTRIBUTION RATES TO ACTUARIALLY DETERMINED CONTRIBUTION BENCHMARK

Pursuant to the adopted 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 Period – The ADC benchmark is determined in conjunction with each actuarial valuation by determining the fixed-rate contribution rates that would result in a 30-year amortization period as of the valuation date.

Payroll Growth Assumption – The ADC benchmark is calculated using a payroll growth assumption that is the lesser of 3.0% and the average payroll growth of the Wichita Falls Fire Department over the last ten (10) years.

Determination of ADC Benchmark Payroll Growth Assumption

Covered Payroll as of:		
	1/1/2024	13,552,165
	1/1/2013 [1]	8,962,581
(a) Average Annual Rate [1]		3.83%
(b) ADC Assumption		3.00%
Lesser of (a) and (b)		**3.00%**

Valuation as of January 1,	*City of Wichita Falls Contribution Rate*	*30-Year ADC Benchmark*	*City Contribution Excess/(Shortfall)*
2024	16.50%	21.48%	(4.98%)
2022	13.25%	15.70%	(2.45%)
2020	13.00%	18.76%	(5.76%)

[1] A valuation was not performed as of January 1, 2014. Therefore, the Average Annual Rate shown is the average payroll growth over the last eleven (11) years.

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2022

ASSETS	COST VALUE	MARKET VALUE
Cash and Cash Equivalents:		
Short Term Investments	216,236.56	216,236.56
Cash	71.97	71.97
Total Cash and Equivalents	216,308.53	216,308.53
Receivables:		
Investment Income	9,693.76	9,693.76
Total Receivable	9,693.76	9,693.76
Investments:		
Stocks	8,224,964.68	7,164,876.62
Alternative	3,482,700.57	3,259,171.96
Mutual Funds:		
Fixed Income	12,906,770.20	11,249,592.70
Equity	20,820,501.84	22,791,165.77
Pooled/Common/Commingled Funds:		
Equity	497,097.79	536,956.87
Real Estate	5,708,799.09	5,833,770.28
Total Investments	51,640,834.17	50,835,534.20
Total Assets	51,866,836.46	51,061,536.49
LIABILITIES		
Payables:		
Refunds of Member Contributions	23,497.87	23,497.87
Investment Expenses	20,918.84	20,918.84
Total Liabilities	44,416.71	44,416.71
NET POSITION RESTRICTED FOR PENSIONS	51,822,419.75	51,017,119.78

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

ADDITIONS			
Contributions:			
Member		1,615,458.51	
City		1,646,524.10	
Total Contributions			3,261,982.61
Investment Income:			
Net Realized Gain (Loss)	649,327.00		
Unrealized Gain (Loss)	(10,793,275.18)		
Net Increase in Fair Value of Investments		(10,143,948.18)	
Interest & Dividends		1,952,474.54	
Less Investment Expense[1]		(253,566.46)	
Net Investment Income			(8,445,040.10)
Total Additions			(5,183,057.49)
DEDUCTIONS			
Distributions to Members:			
Benefit Payments		5,816,656.37	
Lump Sum DROP Distributions		0.00	
Refunds of Member Contributions		211,665.13	
Total Distributions			6,028,321.50
Administrative Expense			132,250.84
Total Deductions			6,160,572.34
Net Increase in Net Position			(11,343,629.83)
NET POSITION RESTRICTED FOR PENSIONS			
Beginning of the Year			62,360,749.61
End of the Year			51,017,119.78
Actuarial Asset Rate of Return			-14.1%
Actuarial Gain/(Loss) due to Investment Return			(13,303,053.40)

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

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2023

ASSETS	COST VALUE	MARKET VALUE
Cash and Cash Equivalents:		
Short Term Investments	19,573.49	19,573.49
Cash	200.00	200.00
Total Cash and Equivalents	19,773.49	19,773.49
Receivables:		
Investment Income	30,760.33	30,760.33
Total Receivable	30,760.33	30,760.33
Investments:		
Stocks	6,653,144.56	7,018,939.20
Alternative	2,888,826.42	2,829,975.58
Mutual Funds:		
Fixed Income	12,490,448.48	11,312,577.08
Equity	21,354,773.42	26,739,532.26
Pooled/Common/Commingled Funds:		
Equity	374,998.27	479,554.53
Real Estate	7,880,621.61	6,820,625.55
Total Investments	51,642,812.76	55,201,204.20
Total Assets	51,693,346.58	55,251,738.02
LIABILITIES		
Payables:		
Refunds of Member Contributions	73,836.32	73,836.32
Investment Expenses	21,716.80	21,716.80
Total Liabilities	95,553.12	95,553.12
NET POSITION RESTRICTED FOR PENSIONS	51,597,793.46	55,156,184.90

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

ADDITIONS			
Contributions:			
Member		1,695,156.83	
City		2,109,815.50	
Total Contributions			3,804,972.33
Investment Income:			
Net Realized Gain (Loss)	715,884.04		
Unrealized Gain (Loss)	4,363,691.41		
Net Increase in Fair Value of Investments		5,079,575.45	
Interest & Dividends		1,964,924.85	
Less Investment Expense[1]		(259,781.34)	
Net Investment Income			6,784,718.96
Total Additions			10,589,691.29
DEDUCTIONS			
Distributions to Members:			
Benefit Payments		5,970,067.66	
Lump Sum DROP Distributions		286,962.21	
Refunds of Member Contributions		110,435.20	
Total Distributions			6,367,465.07
Administrative Expense			83,161.10
Total Deductions			6,450,626.17
Net Increase in Net Position			4,139,065.12
NET POSITION RESTRICTED FOR PENSIONS			
Beginning of the Year			51,017,119.78
End of the Year			55,156,184.90
Actuarial Asset Rate of Return			13.5%
Actuarial Gain/(Loss) due to Investment Return			2,847,027.67

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

STATISTICAL DATA

	1/1/2018	1/1/2020	1/1/2022	1/1/2024
Actives - Tier 1				
Number	138	118	107	99
Average Current Age	40.3	41.4	42.4	44.0
Average Age at Employment	25.4	25.5	25.7	25.7
Average Past Service	14.9	15.9	16.7	18.3
Average Annual Salary	$74,792	$84,917	$87,724	$98,897
Actives - Tier 2				
Number	17	41	53	58
Average Current Age	25.8	26.8	28.7	29.5
Average Age at Employment	25.0	25.2	26.1	25.6
Average Past Service	0.8	1.6	2.6	3.9
Average Annual Salary	$49,141	$56,571	$59,468	$64,851
Service Retirees + DROP				
Number	106	112	116	115
Average Current Age	66.1	66.4	67.4	68.2
Average Annual Benefit	$40,406	$43,280	$46,010	$47,294
Beneficiaries + Alt Payees				
Number	27	34	31	31
Average Current Age	78.0	73.5	73.0	72.9
Average Annual Benefit	$12,403	$13,532	$15,351	$16,802
Disability Retirees				
Number	2	1	0	1
Average Current Age	59.4	53.8	N/A	47.3
Average Annual Benefit	$18,748	$20,117	N/A	$37,270
Terminated Vested				
Number	1	5	3	4
Average Current Age	N/A	34.7	39.4	43.1
Average Annual Benefit [1]	N/A	$49,692	$55,009	$52,231

[1] Average Annual Benefit for Terminated Vested members reflects the benefit for members entitled to a future annual benefit from the plan.

AGE AND SERVICE DISTRIBUTION

ATTAINED AGE	PAST SERVICE 0-1	2-9	10-14	15-19	20	21	22	23	24	25-29	30+	TOTAL
15 - 24	7	1	0	0	0	0	0	0	0	0	0	8
25 - 34	6	37	6	0	0	0	0	0	0	0	0	49
35 - 44	2	17	20	13	1	1	0	0	1	0	0	55
45 - 49	0	0	0	5	2	4	0	2	4	1	0	18
50	0	0	0	2	0	1	0	1	0	1	0	5
51	0	0	0	0	0	0	0	0	0	1	0	1
52	0	0	0	0	0	2	0	0	0	1	1	4
53	0	0	0	0	1	0	0	0	0	1	1	3
54	0	0	0	0	0	0	0	0	1	0	0	1
55 - 59	0	0	0	0	0	1	0	1	3	3	2	10
60+	0	0	0	0	0	0	0	0	0	2	1	3
TOTAL	15	55	26	20	4	9	0	4	9	10	5	157

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 1/1/2022	160
b. Terminations	
i. Vested (partial or full) with deferred benefits	(1)
ii. Non-vested or full lump sum distribution received	(12)
c. Deaths	
i. Beneficiary receiving benefits	0
ii. No future benefits payable	0
d. Disabled	(1)
e. Retired	(4)
f. Continuing participants	142
g. New entrants	15
h. Total active life participants in valuation	157

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

	Service Retirees, DROP Receiving Benefits	Alternate Payees, Beneficiaries Receiving Benefits	Receiving Disability Benefits	Vested Deferred	Total
a. Number prior valuation	116	31	0	3	150
Retired	4	0	0	0	4
Vested Deferred	0	0	0	1	1
Death, With Survivor	(2)	2	0	0	0
Death, No Survivor	(3)	(4)	0	0	(7)
Disabled	0	0	1	0	1
Refund of Contributions	0	0	0	0	0
Rehires	0	0	0	0	0
QDRO	0	2	0	0	2
Expired Annuities	0	0	0	0	0
Data Corrections	0	0	0	0	0
Hired/Termed in Same Year	0	0	0	0	0
b. Number current valuation	115	31	1	4	151

ACTUARIAL ASSUMPTIONS AND METHODS

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 5 years beyond the valuation date using scale MP-2021 and a base year of 2010. We feel these assumptions sufficiently accommodate anticipated future mortality improvements.

Interest Rate

7.50% (previously7.75%) per year, compounded annually, net of expenses. This is supported by the asset allocation of the trust and the long-term expected return by asset class.

Termination Rates

Service	Current Rate	Prior Rate
<1	12.0%	8.0%
1-3	8.0	8.0
4-10	3.0	4.0
11-19	0.25	0.75
20+	3.0	0.75

The assumed rates of termination were approved in conjunction with an actuarial experience study dated October 2022.

Disability Rates

Sample rates are displayed below.

Age	Current Rate	Prior Rate
25	0.028%	0.056%
35	0.038%	0.076%
45	0.084%	0.168%
55	0.215%	0.429%

The assumed rates of disablement were approved in conjunction with an actuarial experience study dated October 2022.

Retirement Age

Hired prior to April 21, 2016:

Years Following Retirement Eligibility	Current Rate	Prior Rate
0	50.0%	50.0%
1	10.0	5.0
2	4.0	5.0
3	4.0	5.0
4	4.0	5.0
5	50.0	83.3
6	50.0	50.0
7	25.0	25.0
8	25.0	25.0
9	25.0	25.0
10+	100.0	100.0

Hired after April 20, 2016:

Age \ Service	20	21	22	23	24	25	26	27	28	29	30+
55	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
56	0.50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
57	0.50	0.05	0.05	0.05	0.05	1.00	1.00	1.00	1.00	1.00	1.00
58	0.50	0.05	0.05	0.05	0.05	1.00	1.00	1.00	1.00	1.00	1.00
59	0.50	0.05	0.05	0.05	0.05	1.00	1.00	1.00	1.00	1.00	1.00
60+	0.50	0.05	0.05	0.05	0.05	1.00	1.00	1.00	1.00	1.00	1.00

The assumed rates of retirement were approved in conjunction with an actuarial experience study dated October 2022.

Retirement Election

Members eligible for the DROP are assumed to elect either straight service retirement benefits or the DROP, whichever is more valuable. Other members are assumed to receive straight service retirement benefits.

Salary Increases

Service	Current Increase	Prior Increase
<2	10.0%	12.0%
2	10.0%	6.5%
3-8	6.0%	6.5%
9-10	6.0%	5.0%
11-19	4.5%	5.0%
20	4.5%	3.5%
21+	3.25%	3.5%

The assumed rates of salary increase were approved in conjunction with an actuarial experience study dated October 2022.

<u>Payroll Growth</u>	3.00% (previously 4.00%) per year for amortization of the Unfunded Actuarial Accrued Liability. The assumed payroll growth rate was approved in conjunction with an actuarial experience study dated October 2022.
<u>Funding Method</u>	Entry Age Normal Actuarial Cost Method
<u>Marital Status</u>	100% of actives are assumed to be married at time of benefit commencement. Males are assumed to be two years older than their spouses.
<u>Dependent Children</u>	Each member is assumed to have two children. The first child is assumed to have been born when the member was age 25. The second child is assumed to be two years younger. It is also assumed that benefits will be paid until each child reaches the age of 20.
<u>Contribution Rates</u>	Members – 13.00% City – 16.50% (previously 13.25%)
<u>Actuarial Asset Method</u>	Fair Market Value.

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>	Total bi-weekly pay, including regular, longevity and overtime pay, and pay received during a period of sick leave or vacation, but excluding lump sum distributions for unused sick leave and/or unused vacation time and pay classified by the City or Department as "merit" pay.
<u>Average Salary</u>	Average Compensation over the 130 consecutive pay periods of service which produces the highest average, multiplied by 2.167.
<u>Member Contributions</u>	13.00% of Compensation.
<u>Service Retirement</u>	
Date	*Hired prior to April 21, 2016:* Attainment of age 50 and 20 years of Credited Service. *Hired after April 20, 2016:* Attainment of age 55 and 20 years of Credited Service.
Benefit	*Hired prior to April 21, 2016:* 2.55% of Average Salary for each year of Credited Service. *Hired after April 20, 2016:* 2.50% of Average Salary for each year of Credited Service. For all members, the minimum service retirement benefit is the member's accrued benefit as of September 1, 2019. The maximum service retirement benefit is $8,333.33 per month, effective September 1, 2019.
Form of Benefit	Life Annuity.

Termination Benefits

Members with <20 years of Credited Service: Refund of member contributions, without interest.

Members with 20+ years of Credited Service: Accrued benefit as described in the Service Retirement section, payable at the Service Retirement age requirement.

Disability

Prior to Attainment of Age 50

Hired prior to January 1, 2004: 50.0% of Average Salary, payable until attainment of age 50.

Hired After December 31, 2003:

Service related – 50.0% of Average Salary, payable until attainment of age 50.
Non-service related – Average Salary multiplied by a factor based on below table, payable until attainment of age 50.

Service	Factor
0-1	5%
2	10
3	15
4	20
5	25
6	30
7	35
8	40
9	45
10+	50

Attainment of Age 50 Following Disability

2.55% multiplied by Average Salary at time of disability for each year of service assuming the member continued employment to age 50 (maximum = 20 years of service).

Attainment of Age 50 Prior to Disability

2.55% multiplied by Average Salary at time of disability for each year of service.

Death Benefits

Surviving Spouse of Member:	Prior to Normal Retirement Eligibility Two-thirds (2/3) multiplied by Average Salary at time of death multiplied by 2.55% for each year of service assuming the member continued employment to age 50. Following Normal Retirement Eligibility Two-thirds (2/3) of the member's accrued benefit, as described under the Service Retirement benefit provision.
Dependent Children of Member:	Each child is entitled to $230 per month, payable until age 18 or until age 23 as long as the child remains a full-time student.

Retroactive Deferred Retirement Option Program

Eligibility	*Hired prior to April 21, 2016:* Attainment of age 55 and 25 years of Credited Service. *Hired after April 20, 2016:* Attainment of age 57 and 25 years of Credited Service.
Participation Period	*Hired prior to April 21, 2016:* Not to exceed 24 months retroactively (53/23). *Hired after April 20, 2016:* Not to exceed 24 months retroactively (55/23).
Accumulation	Sum of the monthly Service Retirement benefit the member would have received if had retired on the Retroactive DROP election date.

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.

- <u>Investment Return</u>: When the rate of return on the Actuarial Value of Assets falls short of the assumption, this produces a loss representing assumed investment earnings that were not realized. Further, it is unlikely that the plan will experience a scenario that matches the assumed return in each year as capital markets can be volatile from year to year. Therefore, amortization periods can vary in the future.

- <u>Salary Increases</u>: When a plan participant experiences a salary increase that was greater than assumed, this produces a loss representing the cost of an increase in anticipated plan benefits for the participant as compared to the previous year. The total gain or loss associated with salary increases for the plan is the sum of salary gains and losses for all active participants.

- <u>Payroll Growth</u>: The plan's payroll growth assumption, if one is used, causes a predictable annual increase in the plan's amortization payment in order to produce an amortization payment that remains constant as a percentage of payroll if all assumptions are realized. If payroll does not increase according to the plan's payroll growth assumption, the plan's amortization period can increase significantly even if all assumptions other than the payroll growth assumption are realized since anticipated contributions rely upon membership payroll.

- <u>Demographic Assumptions</u>: Actuarial results take into account various potential events that could happen to a plan participant, such as retirement, termination, disability, and death. Each of these potential events is assigned a liability based on the likelihood of the event and the financial consequence of the event for the plan. Accordingly, actuarial liabilities reflect a blend of financial consequences associated with various possible outcomes (such as retirement at one of various possible ages). Once the outcome is known (e.g. the participant retires) the liability is adjusted to reflect the known outcome. This adjustment produces a gain or loss depending on whether the outcome was more or less favorable than other outcomes that could have occurred.

- <u>Amortization Period</u>: 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 decreased from 114.0% to 104.0% over the last four valuations, meaning the plan is gradually maturing.

- The Accrued Liability Ratio, determined as the ratio of the Inactive Accrued Liability, which is the liability associated with members who are no longer employed but are due a benefit from the plan, to the Total Accrued Liability, is 60.7%. 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 57.7% to 52.5% 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 -4.8%. 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 $157,900,799. 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 protentional 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

	1/1/2018	1/1/2020	1/1/2022	1/1/2024
Support Ratio				
Total Actives	155	159	160	157
Total Inactives	136	152	150	151
Actives / Inactives	114.0%	104.6%	106.7%	104.0%
Accrued Liability (AL) Ratio				
Inactive Accrued Liability	47,110,356	55,728,507	60,672,881	63,742,016
Total Accrued Liability	88,946,081	93,066,282	95,923,750	104,973,583
Inactive AL / Total AL	53.0%	59.9%	63.3%	60.7%
Funded Ratio				
Actuarial Value of Assets (AVA)	51,317,643	52,839,714	62,360,750	55,156,185
Total Accrued Liability	88,946,081	93,066,282	95,923,750	104,973,583
AVA / Total Accrued Liability	57.7%	56.8%	65.0%	52.5%
Net Cash Flow Ratio				
Net Cash Flow [1]	(2,631,438)	(2,951,685)	(3,433,460)	(2,645,654)
Market Value of Assets (MVA)	51,317,643	52,839,714	62,360,750	55,156,185
Ratio	-5.1%	-5.6%	-5.5%	-4.8%

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

VALUATION NOTES

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.

Covered Annual Payroll is the projected annual rate of pay for the year beginning on the valuation date of all active participants.

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.

Entry Age Normal Cost Method - Under this method, the normal cost is the sum of the individual normal costs for all active participants. For an active participant, the normal cost is the participant's normal cost accrual rate, multiplied by the participant's current compensation. The funding span utilized in determination of the normal cost rate for each benefit is to the last age at which that benefit is payable.

(a) The normal cost accrual rate equals:
   (i) the present value of future benefits for the participant, determined as of the participant's entry age, divided by
   (ii) the present value of the compensation expected to be paid to the participant for each year of the participant's anticipated future service, determined as of the participant's entry age.

(b) In calculating the present value of future compensation, the salary scale is applied both retrospectively and prospectively to estimate compensation in years prior to and subsequent to the valuation year based on the compensation used for the valuation.

(c) The accrued liability is the sum of the individual accrued liabilities for all participants and beneficiaries. A participant's accrued liability equals the present value, at the participant's attained age, of future benefits less the present value at the participant's attained age of the individual normal costs payable in the future. A beneficiary's accrued liability equals the present value, at the beneficiary's attained age, of future benefits. The unfunded accrued liability equals the total accrued liability less the actuarial value of assets.

(d) Under this method, the entry age used for each active participant is the participant's age at the time he or she would have commenced participation if the plan had always been in existence under current terms, or the age as of which he or she first earns service credits for purposes of benefit accrual under the current terms of the plan.