WICHITA FALLS FIREMEN'S
RELIEF AND RETIREMENT FUND

ACTUARIAL VALUATION
AS OF JANUARY 1, 2020

GASB 67 DISCLOSURE INFORMATION
AS OF DECEMBER 31, 2019

FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

May 7, 2020

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. Included are the related results for GASB Statement No. 67. 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. The calculation of the liability for GASB results was performed for the purpose of satisfying the requirements of GASB Statement No. 67. 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 valuations, 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 valuations, 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.

The total pension liability, net pension liability, and certain sensitivity information shown in this report are based on an actuarial valuation performed as of January 1, 2020. It is our opinion that the assumptions used for this purpose are internally consistent, reasonable, and comply with the requirements under GASB No. 67.

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 me at 239-433-5500.

Respectfully submitted,

Foster & Foster Inc.

By: ______________________________
Bradley R. Heinrichs, FSA, EA, MAAA
Enrolled Actuary #20-6901

By: ______________________________
Drew D. Ballard, EA, MAAA
Enrolled Actuary #20-8193

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, 2020, has been completed and the results are presented in this Report. The pension costs, compared with those developed in the January 1, 2018 actuarial valuation, are as follows:

Valuation Date	New Benefits/Assump 1/1/2020	Old Benefits/Assump 1/1/2020	1/1/2018
Current Normal Cost Rate % of Covered Annual Payroll	13.38%	15.59%	15.78%
Funding Measurements			
Actuarial Accrued Liability (AAL)	93,066,282	95,052,723	88,946,081
Actuarial Value of Assets (AVA)	52,839,714	52,839,714	51,317,643
Unfunded Actuarial Accrued Liability (UAAL = AAL - AVA)	40,226,568	42,213,009	37,628,438
Funded Ratio (AVA / AAL)	56.8%	55.6%	57.7%
Amortization Period	43.3 years	Infinite years	Infinite years
Contributions			
Expected City Contribution Rate	13.00%	13.00%	12.00%
Expected Member Contribution Rate	13.00%	13.00%	13.00%
Total Expected Contribution Rate	26.00%	26.00%	25.00%
Funding Costs			
City 20-Year Funding Cost	22.36%	26.56%	24.83%
City 30-Year Funding Cost [1][2]	16.52%	20.77%	19.53%
City 40-Year Funding Cost	13.64%	18.01%	17.02%

[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. The primary source of unfavorable experience was an average investment return of 6.85% over the past two years which fell short of the 7.75% assumption. This loss was offset in part by gains associated with more inactive mortality than expected and an average salary increase of 4.55% which fell short of the 5.28% assumption. These actuarial losses and the average actual payroll growth of 1.9% (lower than the 4.00% assumption) since the previous valuation contributed to an increase in the funding costs shown on the previous page.

Additionally, the Unfunded Actuarial Accrued Liability (UAAL) increased from approximately $37.6m to $42.2m prior to reflecting the benefit changes and updating the mortality assumption. This increase in UAAL is primarily due to the fact that the contributions made during the past two years were less than the Normal Costs (with interest) plus interest on the prior valuation UAAL.

CHANGES SINCE PRIOR VALUATION

Benefit/Fund Changes

Effective September 1, 2019, the following benefit amendments were implemented into the Fund for all active participants:

- A maximum accrued benefit cap of $100,000 per year
- The average final compensation period was increased from 3 years to 5 years for members hired prior to April 21, 2016
- The normal formal of annuity payment was amended from a 66 2/3% Joint & Survivor Annuity to a Life Annuity

Actuarial Assumption/Method Changes

The valuation reflects the following assumption changes:

- The mortality rates were updated to reflect the PubS-2010 (amount-weighted) tables. Previously, the mortality rates reflected the sex distinct RP-2000 mortality tables projected to 2024 using Scale AA. Given the recent release of a report by the Society of Actuaries on public pension mortality, we feel that the PubS-2010 tables are the most representative of the population in question.
- In conjunction with the benefit changes mentioned above, retirement rates were updated to better reflect anticipated future retirement experience.

There were no method changes since the prior valuation.

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	New Benefits/Assump 1/1/2020	Old Benefits/Assump 1/1/2020	1/1/2018
A. Participant Data			
Actives	159	159	155
Service Retirees + DROP	112	112	106
Beneficiaries + Alt Payees	34	34	27
Disability Retirees	1	1	2
Terminated Vested	5	5	1
Total	311	311	291
Covered Annual Payroll	12,339,595	12,339,595	11,887,244
Annual Rate of Payments to:			
Service Retirees + DROP	4,847,404	4,847,404	4,283,040
Beneficiaries + Alt Payees	460,073	460,073	334,875
Disability Retirees	20,117	20,117	37,495
Terminated Vested	99,383	99,383	0
B. Assets			
Actuarial Value (AVA)	52,839,714	52,839,714	51,317,643
Market Value (MVA)	52,839,714	52,839,714	51,317,643
C. Liabilities			
Present Value of Benefits			
Actives			
Retirement + Termination Benefits	50,762,440	57,209,244	57,583,084
Death Benefits	574,459	830,599	784,189
Disability Benefits	1,262,236	1,752,451	1,718,395
Service Retirees + DROP	50,640,585	49,923,160	44,279,704
Beneficiaries + Alt Payees	3,778,389	3,690,214	2,399,518
Disability Retirees	239,677	240,978	421,221
Terminated Vested	1,069,856	1,067,603	9,913
Total	108,327,642	114,714,249	107,196,024

	New Benefits/Assump 1/1/2020	Old Benefits/Assump 1/1/2020	1/1/2018
C. Liabilities - (Continued)			
Present Value of Future Salaries	119,854,271	127,969,557	117,820,181
Normal Cost (Entry Age Normal)			
Retirement + Termination Benefits	1,478,488	1,718,359	1,681,211
Death Benefits	41,330	46,723	43,225
Disability Benefits	70,121	87,099	81,253
Total Normal Cost	1,589,939	1,852,181	1,805,689
Present Value of Future Normal Costs	15,261,360	19,661,526	18,249,943
Actuarial Accrued Liability			
Retirement + Termination Benefits	36,622,309	38,940,669	40,575,767
Death Benefits	153,436	339,826	353,604
Disability Benefits	562,030	850,273	906,354
Inactives	55,728,507	54,921,955	47,110,356
Total Actuarial Accrued Liability (AAL)	93,066,282	95,052,723	88,946,081
Unfunded Actuarial Accrued Liability (UAAL)	40,226,568	42,213,009	37,628,438
Funded Ratio (AVA / AAL)	56.8%	55.6%	57.7%
D. Actuarial Present Value of Accrued Benefits			
Inactives	55,728,507	54,921,955	47,110,356
Actives	28,861,826	28,570,615	29,638,516
Total Present Value Accrued Benefits (PVAB)	84,590,333	83,492,570	76,748,872
Funded Ratio (MVA / PVAB)	62.5%	63.3%	66.9%

GAIN/LOSS ANALYSIS

a. Total (Gain)/Loss

1.	Unfunded Actuarial Accrued Liability as of January 1, 2018	$37,628,438
2.	Normal Cost applicable for 2018	1,805,689
3.	Normal Cost applicable for 2019	1,905,002
4.	Interest on (1), (2), and (3)	6,496,779
5.	Contributions made during 2018	2,931,192
6.	Contributions made during 2019	2,910,950
7.	Interest on (5) and (6)	460,070
8.	Expected UAAL as of January 1, 2020: (1)+(2)+(3)+(4)-(5)-(6)-(7)	41,533,696
9.	Actual UAAL as of January 1, 2020 (Before Changes)	42,213,009
	Total Actuarial (Gain)/Loss	679,313

b. (Gain)/Loss on Assets

1.	Actuarial Value of Assets as of January 1, 2018	51,317,643
2.	Contributions Less Benefit Payments	(5,083,509)
3.	Expected Investment Earnings	7,396,609
4.	Expected AVA as of January 1, 2020: (1)+(2)+(3)	53,630,742
5.	Actual Actuarial Value of Assets as of January 1, 2020 (Before Changes)	52,839,714
	(Gain)/Loss on Assets	791,028

c. Gain/(Loss) on Liabilities

1.	Expected Actuarial Accrued Liability: a(8)+b(4)	95,164,438
2.	Actual Actuarial Accrued Liability (Before Changes)	95,052,723
	(Gain)/Loss on Liabilities	(111,715)

HISTORY OF GAIN/LOSS

Valuation as of January 1,	Actuarial (Gain)/Loss	(Gain)/Loss on Assets	(Gain)/Loss on Liabilities
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:	
1/1/2020	12,339,595
1/1/2009 [1]	8,915,419
(a) Average Annual Rate [1]	3.00%
(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)*
2020	13.00%	18.76%	(5.76%)

[1] A valuation was not performed as of January 1, 2010. Therefore, the Average Annual Rate shown is the average payroll growth over the last eleven (11) years.

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2018

ASSETS	COST VALUE	MARKET VALUE
Cash and Cash Equivalents:		
Short Term Investments	185,304.55	185,304.55
Cash	200.00	200.00
Total Cash and Equivalents	185,504.55	185,504.55
Receivables:		
Investment Income	53,823.59	53,823.59
Total Receivable	53,823.59	53,823.59
Investments:		
U. S. Bonds and Bills	3,833,139.74	3,817,801.49
Federal Agency Guaranteed Securities	945,608.39	925,251.53
Corporate Bonds	615,796.55	596,051.73
Municipal Obligations	49,324.87	48,639.67
Stocks	4,804,539.56	4,299,974.91
Mutual Funds:		
Fixed Income	12,506,772.88	11,965,326.37
Equity	19,577,626.81	20,450,471.33
Pooled/Common/Commingled Funds:		
Equity	2,290,845.07	2,134,695.57
Real Estate	2,000,000.00	2,206,679.83
Total Investments	46,623,653.87	46,444,892.43
Total Assets	46,862,982.01	46,684,220.57
LIABILITIES		
Payables:		
Investment Expenses	20,001.79	20,001.79
Total Liabilities	20,001.79	20,001.79
NET POSITION RESTRICTED FOR PENSIONS	46,842,980.22	46,664,218.78

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
FOR THE YEAR ENDED DECEMBER 31, 2018
Market Value Basis

ADDITIONS			
Contributions:			
Member		1,475,242.09	
City		1,455,949.94	
Total Contributions			2,931,192.03
Investment Income:			
Net Realized Gain (Loss)	3,053,007.56		
Unrealized Gain (Loss)	(6,331,675.99)		
Net Increase in Fair Value of Investments		(3,278,668.43)	
Interest & Dividends		1,172,120.01	
Less Investment Expense[1]		(198,468.53)	
Net Investment Income			(2,305,016.95)
Total Additions			626,175.08
DEDUCTIONS			
Distributions to Members:			
Benefit Payments		4,860,471.41	
Lump Sum DROP Distributions		274,522.00	
Refunds of Member Contributions		26,655.05	
Total Distributions			5,161,648.46
Administrative Expense			117,951.14
Total Deductions			5,279,599.60
Net Increase in Net Position			(4,653,424.52)
NET POSITION RESTRICTED FOR PENSIONS			
Beginning of the Year			51,317,643.30
End of the Year			46,664,218.78
Actuarial Asset Rate of Return			-4.8%
Actuarial Gain/(Loss) due to Investment Return			(6,313,655.26)

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

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2019

ASSETS	COST VALUE	MARKET VALUE
Cash and Cash Equivalents:		
Short Term Investments	172,009.78	172,009.78
Cash	197.04	197.04
Total Cash and Equivalents	172,206.82	172,206.82
Receivables:		
Investment Income	24,273.01	24,273.01
Total Receivable	24,273.01	24,273.01
Investments:		
Stocks	3,436,071.21	3,895,686.00
Mutual Funds:		
Fixed Income	16,500,784.66	16,731,657.26
Equity	20,430,389.37	26,604,764.78
Pooled/Common/Commingled Funds:		
Equity	3,844,014.08	3,209,148.99
Real Estate	2,000,000.00	2,219,071.06
Total Investments	46,211,259.32	52,660,328.09
Total Assets	46,407,739.15	52,856,807.92
LIABILITIES		
Payables:		
Investment Expenses	17,093.76	17,093.76
Total Liabilities	17,093.76	17,093.76
NET POSITION RESTRICTED FOR PENSIONS	46,390,645.39	52,839,714.16

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

ADDITIONS			
Contributions:			
Member		1,468,464.84	
City		1,442,485.07	
Total Contributions			2,910,949.91
Investment Income:			
Net Realized Gain (Loss)	952,717.08		
Unrealized Gain (Loss)	6,633,260.93		
Net Increase in Fair Value of Investments		7,585,978.01	
Interest & Dividends		1,695,090.73	
Less Investment Expense[1]		(153,887.89)	
Net Investment Income			9,127,180.85
Total Additions			12,038,130.76
DEDUCTIONS			
Distributions to Members:			
Benefit Payments		5,238,754.70	
Lump Sum DROP Distributions		463,844.81	
Refunds of Member Contributions		61,403.22	
Total Distributions			5,764,002.73
Administrative Expense			98,632.65
Total Deductions			5,862,635.38
Net Increase in Net Position			6,175,495.38
NET POSITION RESTRICTED FOR PENSIONS			
Beginning of the Year			46,664,218.78
End of the Year			52,839,714.16
Actuarial Asset Rate of Return			20.0%
Actuarial Gain/(Loss) due to Investment Return			5,522,627.04

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

STATISTICAL DATA

	1/1/2016	1/1/2017	1/1/2018	1/1/2020
Actives - Tier 1				
Number	157	148	138	118
Average Current Age	39.8	40.2	40.3	41.4
Average Age at Employment	25.4	25.4	25.4	25.5
Average Past Service	14.4	14.8	14.9	15.9
Average Annual Salary	$67,898	$69,454	$74,792	$84,917
Actives - Tier 2				
Number		9	17	41
Average Current Age		28.5	25.8	26.8
Average Age at Employment		27.9	25.0	25.2
Average Past Service		0.6	0.8	1.6
Average Annual Salary		$45,674	$49,141	$56,571
Service Retirees + DROP				
Number	93	97	106	112
Average Current Age	66.2	66.3	66.1	66.4
Average Annual Benefit	$37,264	$38,861	$40,406	$43,280
Beneficiaries + Alt Payees				
Number	25	25	27	34
Average Current Age	78.6	79.6	78.0	73.5
Average Annual Benefit	$12,437	$12,437	$12,403	$13,532
Disability Retirees				
Number	2	2	2	1
Average Current Age	57.4	58.4	59.4	53.8
Average Annual Benefit	$18,748	$18,748	$18,748	$20,117
Terminated Vested				
Number	3	2	1	5
Average Current Age [1]	N/A	49.9	N/A	34.7
Average Annual Benefit [1]	N/A	$48,704	N/A	$49,692

[1] 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 0-1	2-9	10-14	15-19	20	21	22	23	24	25-29	30+	TOTAL
15 - 24	13	6	0	0	0	0	0	0	0	0	0	19
25 - 34	11	33	6	0	0	0	0	0	0	0	0	50
35 - 44	1	11	18	14	5	0	0	1	0	0	0	50
45 - 49	0	0	2	6	0	3	0	1	0	4	0	16
50	0	0	0	0	1	0	0	0	0	0	0	1
51	0	0	0	0	1	0	0	0	0	0	0	1
52	0	0	0	2	1	0	0	0	0	2	0	5
53	0	0	0	0	1	0	0	0	0	0	1	2
54	0	0	0	0	0	1	0	1	0	1	0	3
55 - 59	0	0	0	0	0	1	0	1	1	1	5	9
60+	0	0	0	0	0	0	0	0	0	0	3	3
TOTAL	25	50	26	22	9	5	0	4	1	8	9	159

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 1/1/2018	155
b. Terminations	
i. Vested (partial or full) with deferred benefits	(5)
ii. Non-vested or full lump sum distribution received	(3)
c. Deaths	
i. Beneficiary receiving benefits	(1)
ii. No future benefits payable	0
d. Disabled	0
e. Retired	(12)
f. Continuing participants	134
g. New entrants	25
h. Total active life participants in valuation	159

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	106	27	2	1	136
Retired	12	0	0	0	12
Vested Deferred	0	0	0	5	5
Death, With Survivor	(5)	8	(1)	0	2
Death, No Survivor	(1)	(2)	0	0	(3)
Disabled	0	0	0	0	0
Refund of Contributions	0	0	0	(1)	(1)
Rehires	0	0	0	0	0
QDRO	0	2	0	0	2
Expired Annuities	0	(1)	0	0	(1)
Data Corrections	0	0	0	0	0
Hired/Termed in Same Year	0	0	0	0	0
b. Number current valuation	112	34	1	5	152

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-2019 and a base year of 2010. We feel these assumptions sufficiently accommodate anticipated future mortality improvements.

Previously, the RP-2000 tables projected to 2024 using Scale AA (Sex Distinct) were used.

Interest Rate

7.75% 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	Rate
<4	8.0%
4-10	4.0
11+	0.75

The assumed rates of termination were approved in conjunction with an actuarial experience study dated October 2017.

Disability Rates

Sample rates are displayed below.

Age	Rate
25	0.056%
35	0.076%
45	0.168%
55	0.429%

The assumed rates of disablement were approved in conjunction with an actuarial experience study dated October 2017.

Retirement Age

Hired prior to April 21, 2016:*

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

* Members who attained age 53 and 23 years of Credited Service as of September 1, 2019 are assumed to retire with 100% probability in 2021.

Hired after April 20, 2016:

	Service										
Age	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 2017. Rates were also adjusted to account for benefit changes effective September 1, 2019.

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	Increase
<2	12.0%
2-8	6.5%
9-19	5.0%
20+	3.5%

The assumed rates of salary increase were approved in conjunction with an actuarial experience study dated October 2017.

Payroll Growth	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 2017.
Funding Method	Entry Age Normal Actuarial Cost Method
Marital Status	100% of actives are assumed to be married at time of benefit commencement. Males are assumed to be two years older than their spouses.
Dependent Children	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.
Contribution Rates	Members – 13.00% City – 13.00%
Actuarial Asset Method	Fair Market Value.

SUMMARY OF BENEFIT PROVISIONS

Credited Service	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.
Compensation	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.
Average Salary	Average Compensation over the 130 consecutive pay periods of service which produces the highest average, multiplied by 2.167.
Member Contributions	13.00% of Compensation.
Service Retirement	
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 127.6% to 104.6% 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 59.9%. 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 64.4% to 56.8% 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 -5.6%. This indicates that contributions are not currently covering the plan's benefit payments and administrative expenses.

It is important to note that the 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

	1/1/2016	1/1/2017	1/1/2018	1/1/2020
Support Ratio				
Total Actives	157	157	155	159
Total Inactives	123	126	136	152
Actives / Inactives	127.6%	124.6%	114.0%	104.6%
Accrued Liability (AL) Ratio				
Inactive Accrued Liability	37,745,891	41,433,907	47,110,356	55,728,507
Total Accrued Liability	75,480,701	79,707,755	88,946,081	93,066,282
Inactive AL / Total AL	50.0%	52.0%	53.0%	59.9%
Funded Ratio				
Actuarial Value of Assets (AVA)	48,591,992	49,802,579	51,317,643	52,839,714
Total Accrued Liability	75,480,701	79,707,755	88,946,081	93,066,282
AVA / Total Accrued Liability	64.4%	62.5%	57.7%	56.8%
Net Cash Flow Ratio				
Net Cash Flow [1]	(1,580,851)	(1,986,330)	(2,631,438)	(2,951,685)
Market Value of Assets (MVA)	46,577,636	46,915,744	51,317,643	52,839,714
Ratio	-3.4%	-4.2%	-5.1%	-5.6%

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

VALUATION NOTES

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.

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2019

ASSETS	MARKET VALUE
Cash and Cash Equivalents:	
Short Term Investments	172,010
Cash	197
Total Cash and Equivalents	172,207
Receivables:	
Distribution Receivable	51,013
Investment Income	11,498
Total Receivable	62,511
Investments:	
Investments in Partnership	5,428,223
Common/Collective Trusts	22,382,116
Mutual Funds	20,954,305
Corporate Stocks	3,895,686
Total Investments	52,660,330
Total Assets	52,895,048
LIABILITIES	
Payables:	
Investment Expenses	17,094
Total Liabilities	17,094
NET POSITION RESTRICTED FOR PENSIONS	52,877,954

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

ADDITIONS		
Contributions:		
Member	1,468,465	
City	1,442,485	
Total Contributions		2,910,950
Investment Income:		
Net Increase in Fair Value of Investments	7,975,430	
Interest & Dividends	1,564,764	
Less Investment Expense[1]	(397,610)	
Net Investment Income		9,142,584
Total Additions		12,053,534
DEDUCTIONS		
Distributions to Members:		
Benefits paid to participants	5,234,474	
Lump Sum DROP Distributions	463,845	
Refunds and drop payments	61,403	
Total Distributions		5,759,722
Administrative Expense		111,432
Total Deductions		5,871,154
Net Increase in Net Position		6,182,380
NET POSITION RESTRICTED FOR PENSIONS		
Beginning of the Year		46,695,574
End of the Year		52,877,954

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

NOTES TO THE FINANCIAL STATEMENTS
(For the Year Ended December 31, 2019)

Plan Administration

The Wichita Falls Firemen's Relief and Retirement Fund is a single-employer defined benefit plan, established under the authority of the Texas Local Fire Fighter's Retirement Act (TLFFRA). The fund is administered by a Board of Trustees. The Board is made up of three members elected from and by the fund members, two representatives of the City of Wichita Falls, Texas, and two citizen members.

Plan Membership as of January 1, 2020:

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	147
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	5
Active Plan Members	159
	311

Benefits Provided

The Plan provides retirement, termination, disability and death benefits.

A summary of the benefit provisions can be found in the January 1, 2020 Actuarial Valuation Report for the Wichita Falls Firemen's Relief and Retirement Fund prepared by Foster & Foster Actuaries and Consultants.

Incorporated are the benefit changes for measurement date 09/30/2019 as noted under the Notes to Schedule of Changes in Net Pension Liability and Related Ratios.

Contribution Rates:

Members: 13.00%

City - 13.00%

Investment Policy:

The following was the Board's adopted asset allocation policy as of December 31, 2019:

Asset Class	Target Allocation
Domestic Equity	40%
International Equity	15%
Domestic Fixed Income	20%
Global Fixed Income	5%
Real Estate	10%
GTAA	10%
Total	100%

Concentrations:

The Plan did not hold investments in any one organization that represent 5 percent or more of the Pension Plan's Fiduciary Net Position.

Rate of Return:

For the year ended December 31, 2019, the annual money-weighted rate of return on Pension Plan investments, net of Pension Plan investment expense, was 20.15 percent.

The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Retroactive Deferred Retirement Option Program

Eligibility Hired prior to April 21, 2016:

Attainment of age 55 and 25 years of Credited Service.

Eligibility 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).

Participation Period Hired after April 20, 2016:

Not to exceed 24 months retroactively (55/23).

The DROP balance as December 31, 2019 is $0.

NET PENSION LIABILITY OF THE SPONSOR

The components of the Net Pension Liability of the Sponsor on December 31, 2019 were as follows:

Total Pension Liability	$ 125,911,289
Plan Fiduciary Net Position	$ (52,877,954)
Sponsor's Net Pension Liability	$ 73,033,335
Plan Fiduciary Net Position as a percentage of Total Pension Liability	42.00%

Actuarial Assumptions:

The Total Pension Liability was determined by an actuarial valuation as of January 1, 2020 using the following actuarial assumptions:

Inflation	3.00%
Salary Increases	Service based
Discount Rate	4.99%
Investment Rate of Return	7.75%

Mortality Rate Active Lives:
PubS-2010 Mortality Table for Employees.
Mortality Rate Retiree and Vested Terminated Lives:
PubS-2010 Mortality Table for Healthy Retirees.
Mortality Rate Contingent Survivor Lives:
PubS-2010 Mortality Table for Contingent Survivors.
Mortality Rate 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-2019 and a base year of 2010. We feel these assumptions sufficiently accommodate anticipated future mortality improvements.

The most recent actuarial experience study used to review the other significant assumptions was dated October 6, 2017.

The Long-Term Expected Rate of Return on Pension Plan investments can be determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of Pension Plan investment expenses and inflation) are developed for each major asset class.
For 2019, the inflation rate assumption of the investment advisor was 2.50%.
These ranges are combined to produce the Long-Term Expected Rate of Return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Best estimates of geometric real rates of return for each major asset class included in the Pension Plan's target asset allocation as of December 31, 2019 are summarized in the following table:

Asset Class	Long Term Expected Real Rate of Return
Domestic Equity	7.50%
International Equity	8.50%
Domestic Fixed Income	2.50%
Global Fixed Income	3.50%
Real Estate	4.50%
GTAA	3.50%

Discount Rate:
The projection of cash flows used to determine the Discount Rate assumed that current Plan Member and Sponsor contributions will be made at the current contribution rate. Future Member's contributions in excess of their normal cost were also included. Based on those assumptions, the Pension Plan's Fiduciary Net Position was projected to provide future benefit payments for 26 years. These payments were discounted using a discount rate of 7.75%. Future benefits payments beyond 26 years were discounted using a high quality municipal bond rate of 3.26%. The high quality municipal bond rate was based on the week closest to, but not later than, the measurement date of the S&P Municipal Bond 20 Year High Grade Rate Index. The single equivalent discount rate was 4.99%.

	1% Decrease 3.99%	Current Discount Rate 4.99%	1% Increase 5.99%
Sponsor's Net Pension Liability	$ 90,178,432	$ 73,033,335	$ 58,897,775

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS

Last 10 Years

	12/31/2019	12/31/2018	12/31/2017
Total Pension Liability			
Service Cost	2,923,162	3,797,094	2,514,077
Interest	6,405,216	5,944,979	5,887,833
Changes of benefit terms	(6,621,408)	-	-
Differences between Expected and Actual Experience	(117,512)	3,358,881	1,599,916
Changes of assumptions	(1,593,843)	933,535	24,056,360
Benefit Payments, including Refunds of Employee Contributions	(5,759,722)	(5,292,918)	(5,250,040)
Net Change in Total Pension Liability	(4,764,107)	8,741,571	28,808,146
Total Pension Liability - Beginning	130,675,396	121,933,825	93,125,679
Total Pension Liability - Ending (a)	$ 125,911,289	$ 130,675,396	$ 121,933,825
Plan Fiduciary Net Position			
Contributions - Employer	1,442,485	1,455,950	1,411,351
Contributions - Employee	1,468,465	1,475,242	1,463,122
Net Investment Income	9,142,584	(2,225,595)	6,581,299
Benefit Payments, including Refunds of Employee Contributions	(5,759,722)	(5,292,918)	(5,250,040)
Administrative Expense	(111,432)	(96,102)	(124,267)
Other	-	-	347,490
Net Change in Plan Fiduciary Net Position	6,182,380	(4,683,423)	4,428,955
Plan Fiduciary Net Position - Beginning	46,695,574	51,378,997	46,950,042
Plan Fiduciary Net Position - Ending (b)	$ 52,877,954	$ 46,695,574	$ 51,378,997
Net Pension Liability - Ending (a) - (b)	$ 73,033,335	$ 83,979,822	$ 70,554,828
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	42.00%	35.73%	42.14%
Covered Payroll	$ 11,295,885	11,348,015	11,254,785
Net Pension Liability as a percentage of Covered Payroll	646.55%	740.04%	626.89%

SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS

Last 10 Years

	12/31/2016	12/31/2015	12/31/2014[1]
Total Pension Liability			
Service Cost	1,613,166	1,514,459	1,447,068
Interest	5,740,141	5,743,802	5,537,931
Changes of benefit terms	-	6,752	-
Differences between Expected and Actual Experience	1,231,956	(3,155,703)	(320,862)
Changes of assumptions	16,673,408	-	(423,984)
Benefit Payments, including Refunds of Employee Contributions	(4,543,166)	(3,950,906)	(3,616,549)
Net Change in Total Pension Liability	20,715,505	158,404	2,623,604
Total Pension Liability - Beginning	72,410,174	72,251,770	69,628,166
Total Pension Liability - Ending (a)	$ 93,125,679	$ 72,410,174	$ 72,251,770
Plan Fiduciary Net Position			
Contributions - Employer	1,283,410	1,273,913	1,232,957
Contributions - Employee	1,350,904	1,221,926	1,144,644
Net Investment Income	2,577,572	421,270	3,284,243
Benefit Payments, including Refunds of Employee Contributions	(4,543,166)	(3,950,906)	(3,616,549)
Administrative Expense	(115,843)	(87,245)	(85,636)
Other	250	-	-
Net Change in Plan Fiduciary Net Position	553,127	(1,121,042)	1,959,659
Plan Fiduciary Net Position - Beginning	46,396,915	47,517,957	45,558,298
Plan Fiduciary Net Position - Ending (b)	$ 46,950,042	$ 46,396,915	$ 47,517,957
Net Pension Liability - Ending (a) - (b)	$ 46,175,637	$ 26,013,259	$ 24,733,813
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	50.42%	64.08%	65.77%
Covered Payroll	10,391,569	10,182,717	9,520,903
Net Pension Liability as a percentage of Covered Payroll	444.36%	255.46%	259.78%

Notes to Schedule of Changes in Net Pension Liability and Related Ratios

[1] The 2014 results were provided by the prior actuary, John M. Crider, Jr.

Changes of benefit terms:
For measurement date 12/31/2019, the following benefit amendments were implementated for all active participants:
- A maximum accrued benefit cap of $100,000 per year
- The average final compensation period was increased from 3 years to 5 years for members hired prior to April 21, 2016
- The normal formal of annuity payment was amended from a 66 2/3% Joint & Survivor Annuity to a Life Annuity

For measurement date 12/31/2015, amounts reported as changes of benefits resulted from:
- The member contribution rate was increased from 12.0% to 13.0% of Salary for all members.
- All future new entrants will accrue benefits under a “Tier 2” benefit structure.

Changes of assumptions:
For purposes of determining the GASB discount rate at the 12/31/2019 measurement date, a depletion date projection as of that date have been performed. The results of this projection showed a single discount rate of 4.99%. The discount rate was increased from 4.90% to 4.99%. Additionally, the retirement rates were updated to better reflect anticipated future retirement experience.

For purposes of determining the GASB discount rate at the 12/31/2018 measurement date, a depletion date projection as of that date have been performed. The results of this projection showed a single discount rate of 4.90%. The discount rate was increased from 4.83% to 4.90%. Additionally, the mortality rates were updated to reflect the PubS-2010 tables.

For purposes of determining the GASB discount rate at the 12/31/2017 measurement date, a depletion date projection as of that date have been performed. The results of this projection showed a single discount rate of 4.83%. The discount rate was decreased from 6.33% to 4.83%. Other actuarial changes of assumptions in the 2017 year were a result of an actuarial experience study dated October 6, 2017, as approved by the Board of Trustees, the following changes were made:
- The actuarial asset method was changed to eliminate asset smoothing.
- The investment return assumption was lowered from 8.00% to 7.75% per year, net of all expenses.
- The assumed rates of salary increases were amended.
- The assumed rates of retirement were amended.
- The assumed rates of withdrawal were amended.
- The assumed rates of disablement were amended.

For purposes of determining the GASB discount rate at the 12/31/2016 measurement date, a depletion date projection as of th
date have been performed. The results of this projection showed a single discount rate of 6.33%.
The discount rate was decreased from 8.00% to 6.33%.

SCHEDULE OF CONTRIBUTIONS

Last 10 Years

Year Ended	Contractually Required Contribution	Contributions in relation to the Contractually Required Contributions	Contribution Deficiency (Excess)	Covered Payroll	Contributions as a percentage of Covered Payroll
12/31/2019	$ 1,442,485	$ 1,442,485	$ -	$ 11,295,885	12.77%
12/31/2018	$ 1,455,950	$ 1,455,950	$ -	$ 11,348,015	12.83%
12/31/2017	$ 1,411,351	$ 1,411,351	$ -	$ 11,254,785	12.54%
12/31/2016	$ 1,283,410	$ 1,283,410	$ -	$ 10,391,569	12.35%
12/31/2015	$ 1,273,913	$ 1,273,913	$ -	$ 10,182,717	12.51%
12/31/2014[1]	$ 1,232,957	$ 1,232,957	$ -	$ 9,520,903	12.95%

[1] The 2014 results were provided by the prior actuary, John M. Crider, Jr.

<u>Notes to Schedule</u>

Methods and assumptions used to determine contribution rates:

Mortality Rate: RP-2000 projected to 2024 using Scale AA - Sex Distinct. We feel this sufficiently accommodates expected mortality improvements.

Retirement Age: *Hired prior to April 21, 2016:*

Years Following Retirement Eligibility	Rate
0	25.0%
1	5.0%
2	5.0%
3	5.0%
4	5.0%
5	33.3%
6	50.0%
7	25.0%
8	25.0%
9	25.0%
10+	100.0%

Hired after April 20, 2016:

Age \ Service	20	21	22	23	24	25	26	27	28	29	30+
55	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
56	0.25	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
57	0.25	0.05	0.05	0.05	0.05	0.5	0.5	0.5	0.5	0.5	0.5
58	0.25	0.05	0.05	0.05	0.05	0.5	0.5	0.5	0.5	0.5	0.5
59	0.25	0.05	0.05	0.05	0.05	0.5	0.5	0.75	0.75	0.75	0.75
60+	0.25	0.05	0.05	0.05	0.05	1	1	1	1	1	1

The assumed rates of retirement were approved in conjunction with an actuarial experience study dated October 2017.

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.

Termination Rate:

Service	Termination Rate
<4	8.00%
4-10	4.00%
11+	0.75%

The assumed rates of termination were approved in conjunction with an actuarial experience study dated October 2017.

Disability Rates:

Sample rates are displayed below:

Age	Disability Rate
25	0.056%
35	0.076%
45	0.168%
55	0.429%

The assumed rates of disablement were approved in conjunction with an actuarial experience study dated October 2017.

Interest Rate: 7.75% 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.

Salary Increases:

Service	Increase
<2	12.0%
2-8	6.5%
9-19	5.0%
20+	3.5%

The assumed rates of salary increase were approved in conjunction with an actuarial experience study dated October 2017.

Payroll Growth:	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 2017.
Funding Method:	Entry Age Normal Actuarial Cost Method.
Marital Status:	100% of actives are assumed to be married at time of benefit commencement. Males are assumed to be two years older than their spouses.
Dependent Children:	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.
Contribution Rates:	Members - 13.00%. City – 12.00% (12.83% in 2018, 12.77% in 2019).
Actuarial Asset Method:	Fair Market Value.

SCHEDULE OF INVESTMENT RETURNS

Last 10 Years

Fiscal Year Ended	Annual Money-Weighted Rate of Return Net of Investment Expense
12/31/2019	20.15%
12/31/2018	-4.60%
12/31/2017	15.42%
12/31/2016	5.10%
12/31/2015	0.45%
12/31/2014[1]	7.32%

[1] The 2014 results were provided by the prior actuary, John M. Crider, Jr.