



THE CITY OF NEW HAVEN POLICEMEN AND FIREMEN'S PENSION FUND

ACTUARIAL VALUATION REPORT

JULY 1, 2022



h&h[®]
hooker & holcombe



Table of Contents

Executive Summary	1
Valuation Results and Highlights	2
Purpose of the Valuation	2
Information Available in the Valuation Report.....	2
Changes Reflected in the Valuation.....	2
Cash Contribution for Fiscal Years Ending 2024 and 2025	2
Liability Experience During Period Under Review	2
Asset Experience During Period Under Review	2
Assessment and Measurement of Risks	3
Certification	5
Development of Unfunded Accrued Liability and Funded Ratio.....	6
Determination of Normal Cost and Actuarially Determined Employer Contribution.....	8
Actuarially Determined Employer Contribution per Group	10
Valuation Contribution Change	11
Determination of Actuarial Gain/Loss	12
Development of Asset Values.....	13
Target Allocation and Expected Rate of Return	19
Amortization of Unfunded Liability	20
Member Data	21
Active Member Count by Age and Years of Service	24
Expected Benefit Payments from Trust Fund.....	25
Long Range Forecast.....	26
Description of Actuarial Methods	27
Description of Actuarial Assumptions	28
Summary of Plan Provisions	31

Report Prepared By:

Richard S. Sych
President & Consulting Actuary
860.856.2112
RSych@hhconsultants.com

Robert P. Lessard
Consulting Actuary
860.856.2106
RLessard@hhconsultants.com

David R. Mendel
Senior Actuarial Associate
860.856.2132
DMendel@hhconsultants.com



Executive Summary

	July 1, 2022	July 1, 2020
Number of members		
Active employees	642	652
Terminated vested members	3	4
Vested in employee contributions only	35	32
Retired, disabled and beneficiaries	1,390	1,379
Total	2,070	2,067
Covered employee payroll	60,718,832	59,157,790
Average plan salary	94,578	90,733
Actuarial present value of future benefits	1,163,964,694	1,085,973,767
Actuarial accrued liability	1,036,906,635	970,550,110
Plan assets		
Market value of assets	339,344,209	325,990,716
Actuarial value of assets	360,717,628	331,776,985
Unfunded accrued liability	676,189,007	638,773,125
Funded ratio	34.8%	34.2%
Actuarially determined employer contribution (ADEC)		
Fiscal year ending	2024	2022
ADEC	55,828,369	51,975,070
Fiscal year ending	2025	2023
ADEC	57,224,078	53,274,447



Valuation Results and Highlights

Purpose of the Valuation

The purpose of the valuation is to develop the Actuarially Determined Employer Contribution (ADEC).

The ultimate cost of a pension plan is based primarily on the level of benefits promised by the plan. The pension fund's investment earnings serve to reduce the cost of plan benefits and expenses. Thus,

$$\text{Ultimate cost} = \text{Benefits Paid} + \text{Expenses Incurred} - \text{Investment Return} - \text{Employee Contributions}$$

The actuarial cost method distributes this ultimate cost over the working lifetime of current plan participants. By means of this budgeting process, costs are allocated to both past and future years, and a cost is assigned to the current year. The current year's allocated cost, or normal cost, is the building block upon which the actuarially determined employer contribution is developed. The July 1, 2022 valuation produces the contributions for the fiscal years ending 2024 and 2025.

Information Available in the Valuation Report

The Executive Summary is intended to emphasize the notable results of the valuation from the perspective of the Plan Sponsor. Supporting technical detail is documented in Results of the Valuation, Supporting Exhibits and Description of Actuarial Methods and Assumptions. A concise summary of the principal provisions of the Plan is outlined in Summary of Plan Provisions.

Changes Reflected in the Valuation

The mortality improvement scale was updated and the investment rate of return assumption was lowered from 7.25% to 6.90%. The net impact was an increase in the unfunded accrued liability and ADEC of \$37.8 million and \$2.4 million, respectively.

Cash Contribution for Fiscal Years Ending 2024 and 2025

The City cost is:	2024 Fiscal Year	2025 Fiscal Year
Police	\$28,695,831	\$29,413,227
Fire	<u>27,132,538</u>	<u>27,810,851</u>
Total	\$55,828,369	\$57,224,078

Liability Experience During Period Under Review

The plan experienced a net actuarial gain on liabilities of approximately \$4,533,000 since the prior valuation. The primary drivers for the gains were favorable retirement and mortality experience and a COLA increase that was less than expected.

Asset Experience During Period Under Review

The plan's assets provided the following rates of return during the past two fiscal years:

	2021 Fiscal Year	2022 Fiscal Year
Market Value Basis	26.9%	-11.1%
Actuarial Value Basis	10.9%	6.4%

The Actuarial Value of assets, rather than the Market Value, is used to determine plan contributions. The Actuarial Value spreads the asset volatility over 5 years, thereby smoothing out fluctuations that are inherent in the Market Value.



Assessment and Measurement of Risks

Financial Significance of Plan

It is important to understand the size of the pension plan compared to the size of the sponsor of that plan. Additional pension contributions may be required at inopportune times for the plan sponsor. In general, a plan sponsor with assets or revenue that are much larger than the liabilities in its pension plans will be better able to withstand increases in required pension contributions.

Plan Maturity Measurements

	July 1, 2022	July 1, 2020
Actuarial accrued liability for members currently in pay status as a percentage of the total actuarial accrued liability	80.7%	77.7%
<ul style="list-style-type: none"> • A lower percentage results in greater volatility as the investment return assumption changes. • A higher percentage results in greater demand on cash due to a proportionately higher percentage of benefits being in pay status. 		

	July 1, 2022
Duration of benefit payments using an investment rate of return of 6.90%	12.6 years
<ul style="list-style-type: none"> • A higher duration will occur if the plan's percentage of members in pay status decreases. A plan with a higher duration will have a liability that is more sensitive to changes in the investment return assumption. 	

	July 1, 2022	July 1, 2020
Ratio of market value of assets to covered payroll	5.6	5.5
<ul style="list-style-type: none"> • A higher ratio is more typical of relatively mature plans with a larger percentage of inactive members and may cause more potential contribution volatility as pension fund assets fluctuate. 		

	July 1, 2022
Ratio of market value of assets to expected benefit payments	4.7
<ul style="list-style-type: none"> • A plan with a high percentage of members in pay status can have a low ratio. As the ratio decreases, liquidity risk increases, and may indicate the need to review (and potentially adjust) the plan sponsor's funding policy contribution. 	



Risks to Assess

Estimated Impact of a 5% Reduction in Market Value of Assets

	Fiscal Year Ending 2024	Fiscal Year Ending 2025
Increase in actuarially determined employer contribution (ADEC)	237,288	243,220

- Plans would generally be subject to a larger amortization payment if the market value of assets were 5% smaller. As a result, the ADEC would generally be higher for up to 22 years.

Due to the asset smoothing method, the ADEC will additionally increase by the same amount in each of the next few years. Each of these additional contributions will continue for up to 22 years.

Historical Results

Valuation Year Beginning	Investment Return Assumption	Annual Effective Rate of Return on Market Value of Assets	Market Value of Assets as a % of Actuarial Accrued Liability	Benefit Payments as a % of Market Value of Assets
2022	6.90%	N/A	32.7%	N/A
2021	N/A	-11.1%	N/A	17.7%
2020	7.25%	26.9%	33.6%	20.8%
2019	N/A	7.1%	N/A	20.2%
2018	7.75%	7.0%	39.1%	19.2%
2017	N/A	2.2%	N/A	17.5%
2016	7.75%	14.6%	39.1%	17.9%



Certification

This report presents the results of the July 1, 2022 Actuarial Valuation for The City of New Haven Policemen and Firemen's Pension Fund (the Plan) for the purpose of estimating the funded status of the Plan and determining the Actuarially Determined Employer Contribution (ADEC) for the fiscal years ending June 30, 2024 and June 30, 2025. This report may not be appropriate for any other purpose.

The valuation has been performed in accordance with generally accepted actuarial principles and practices. It is intended to comply with all applicable Actuarial Standards of Practice.

I certify that the actuarial assumptions and methods that were selected by me and represent my best estimate of anticipated actuarial experience under the Plan. The combined effect of the actuarial assumptions and methods is not expected to contain significant bias, meaning it is not overly optimistic or pessimistic.

In preparing this valuation, I have relied on employee data provided by the Plan Sponsor, and on asset and contribution information provided by the Trustee. I have audited neither the employee data nor the financial information, although I have reviewed them for reasonableness.

The results in this valuation report are based on the Plan as summarized in the *Summary of Plan Provisions* section of this report and the actuarial assumptions and methods detailed in the *Description of Actuarial Methods and Assumptions* section of this report.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of this report, an analysis of the potential range of such future measurements has not been performed.

I have no relationship with the employer or the Plan that would impair, or appear to impair, my objectivity in performing the work presented in this report. I am a member of the American Academy of Actuaries and meet its Qualification Standards to render the actuarial opinion contained herein.

Richard S. Sych, FSA, FCA, MAAA,
Enrolled Actuary 20-05065

Robert P. Lessard, ASA, FCA, MAAA,
Enrolled Actuary 20-08801

March 2, 2023

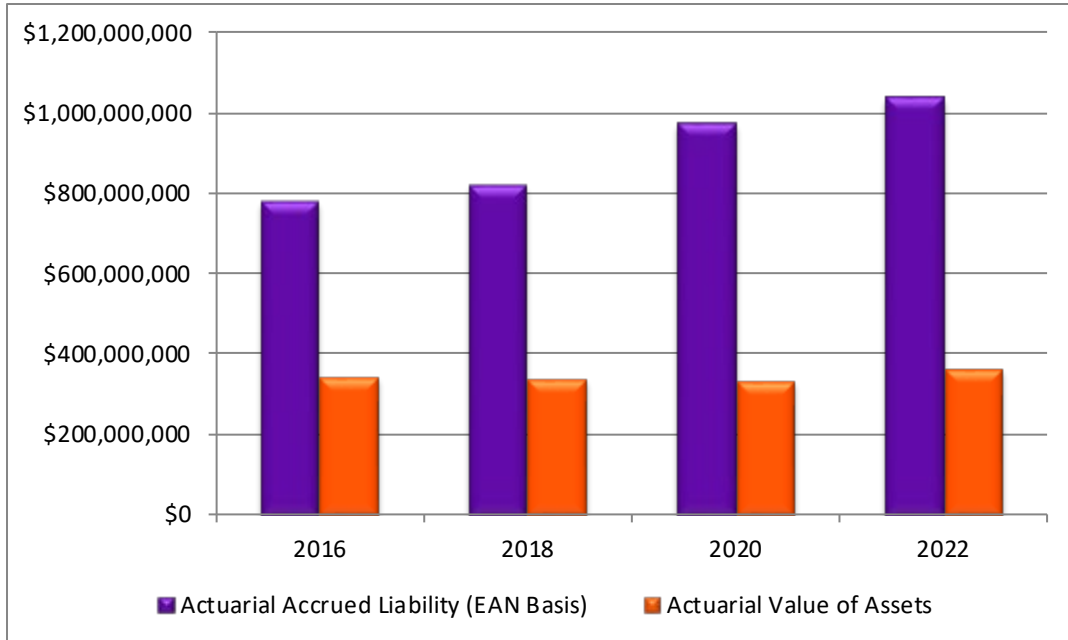


Development of Unfunded Accrued Liability and Funded Ratio

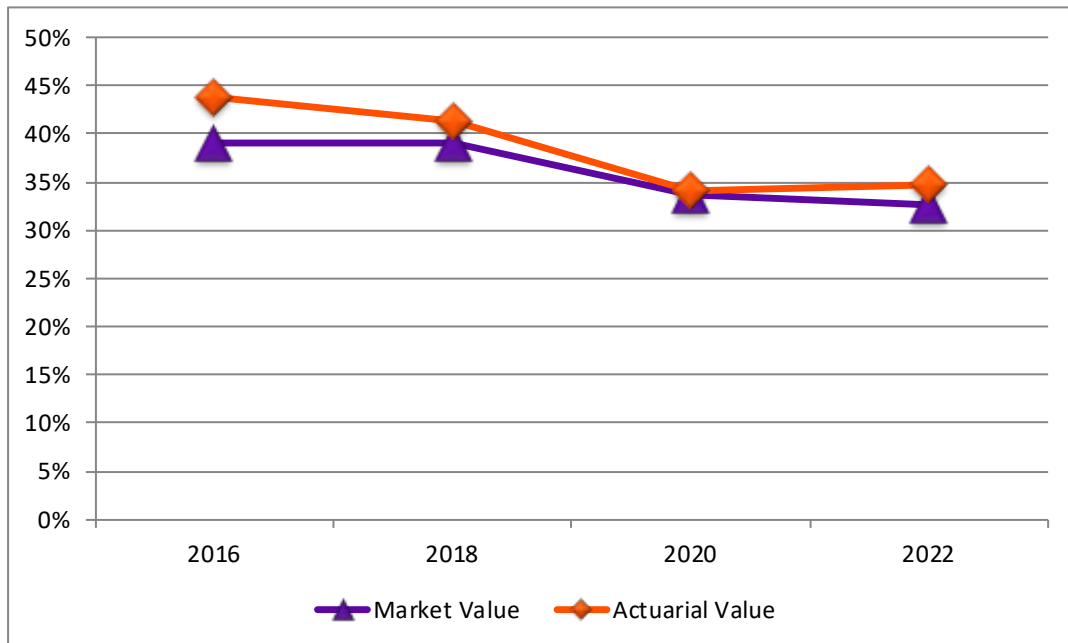
	July 1, 2022	July 1, 2020
Actuarial accrued liability for inactive members		
Retired, disabled and beneficiaries	\$837,104,738	\$754,461,853
Terminated vested members	1,708,733	1,710,829
Due refund of employee contributions only	371,849	257,670
Total	839,185,320	756,430,352
Actuarial accrued liability for active employees	197,721,315	214,119,758
Total actuarial accrued liability	1,036,906,635	970,550,110
Actuarial value of assets	360,717,628	331,776,985
Unfunded accrued liability	676,189,007	638,773,125
Funded ratio	34.8%	34.2%



Actuarial Accrued Liability vs. Actuarial Value of Assets



Funded Ratio



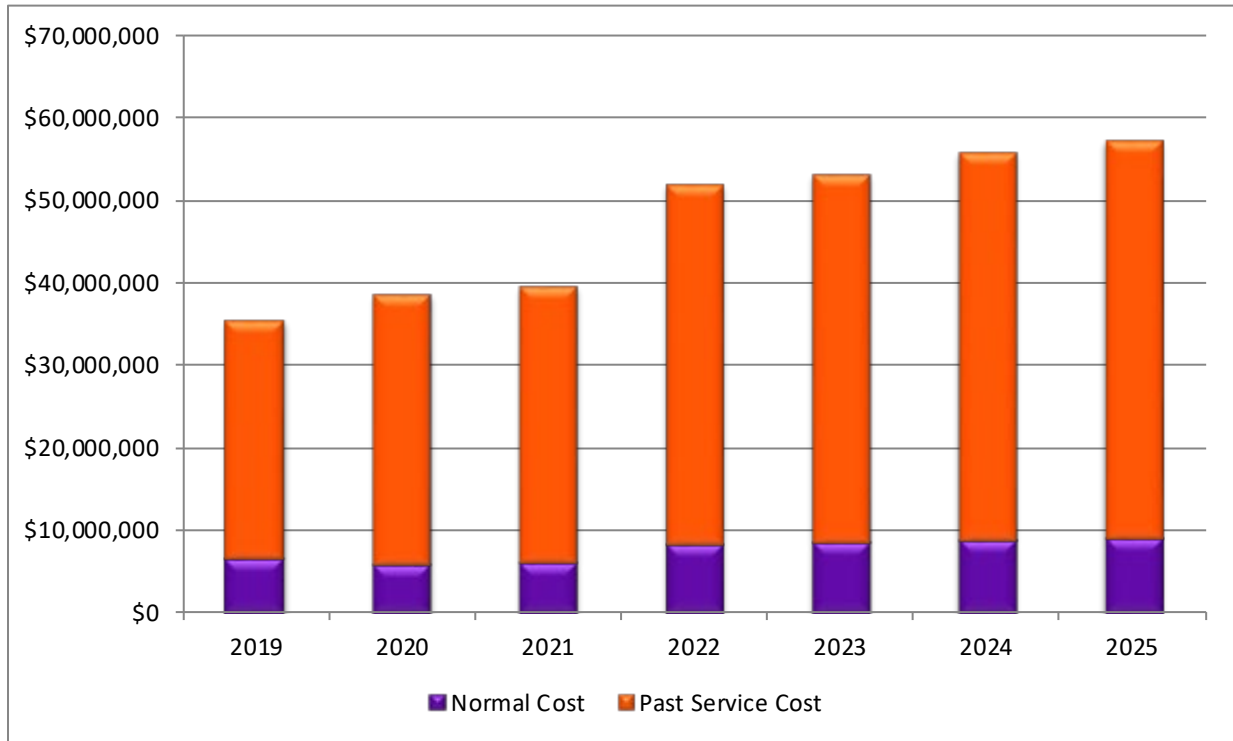


Determination of Normal Cost and Actuarially Determined Employer Contribution

	July 1, 2022		July 1, 2020	
	Cost	Percent of payroll	Cost	Percent of payroll
Gross normal cost	\$15,002,231	25.1%	\$14,662,115	24.4%
Estimated employee contributions	(6,862,114)	-11.5%	(6,919,971)	-11.5%
Estimated administrative expenses	197,051	0.4%	284,200	0.5%
City's normal cost	8,337,168	14.0%	8,026,344	13.4%
Amortization of unfunded accrued liability	46,129,533	77.3%	42,681,041	71.0%
Contribution before adjustment as of the valuation date	54,466,701	91.3%	50,707,385	84.4%
Estimated valuation year payroll for actives not yet at 100% assumed retirement age	59,681,763		60,113,647	
Fiscal year ending	2024		2022	
Adjustment for interest and inflation	1,361,668		1,267,685	
Actuarially determined employer contribution	55,828,369		51,975,070	
Fiscal year ending	2025		2023	
Adjustment for interest and inflation	1,395,709		1,299,377	
Actuarially determined employer contribution	57,224,078		53,274,447	



Actuarially Determined Employer Contribution





Actuarially Determined Employer Contribution per Group

	Police	Fire	Total
Gross normal cost	\$6,957,321	\$8,044,910	\$15,002,231
Estimated employee contributions	(3,565,445)	(3,296,669)	(6,862,114)
Estimated administrative expenses	91,383	105,668	197,051
City's normal cost	3,483,259	4,853,909	8,337,168
Actuarial accrued liability	550,999,591	485,907,044	1,036,906,635
Actuarial value of assets	191,680,966	169,036,662	360,717,628
Unfunded accrued liability	359,318,625	316,870,382	676,189,007
Amortization of unfunded accrued liability	24,512,673	21,616,860	46,129,533
Contribution before adjustment as of the valuation date	27,995,932	26,470,769	54,466,701
Estimated valuation year payroll for actives not yet at 100% assumed retirement age	29,712,042	29,969,721	59,681,763
City's normal cost as a percentage of payroll	11.7%	16.2%	14.0%
Contribution as a percentage of payroll	94.2%	88.3%	91.3%
Fiscal year ending June 30, 2024			
Adjustment for interest and inflation	699,899	661,769	1,361,668
Actuarially determined employer contribution	28,695,831	27,132,538	55,828,369
Fiscal year ending June 30, 2025			
Adjustment for interest and inflation	717,396	678,313	1,395,709
Actuarially determined employer contribution	29,413,227	27,810,851	57,224,078



Valuation Contribution Change

Valuation Contribution Change		
Contribution before adjustment as of July 1, 2020		\$50,707,385
Decrease due to actuarial return on assets	(\$648,061)	
Decrease due to liability gains	(318,233)	
Expected increase in normal cost	406,334	
Expected increase in amortization of unfunded accrued liability	2,160,728	
Increase due to assumption or method changes	2,398,828	
Miscellaneous decrease	<u>(240,280)</u>	
Total increase in contribution		<u>3,759,316</u>
Contribution before adjustment as of July 1, 2022		54,466,701



Determination of Actuarial Gain/Loss

The Actuarial Gain/Loss is the difference between the expected unfunded accrued liability and the actual unfunded accrued liability, without regard to any changes in actuarial methods, actuarial assumptions or plan provisions. This can also be referred to an Experience Gain/Loss, since it reflects the difference between what was expected and what was actually experienced.

Actuarial Gain / Loss	
Expected unfunded accrued liability July 1, 2022	
Expected unfunded accrued liability July 1, 2021	
Unfunded accrued liability July 1, 2020	\$638,773,125
Gross normal cost July 1, 2020	14,946,315
City and employee contributions for 2020-2021	(47,439,212)
Interest at 7.25% to July 1, 2021	<u>45,448,058</u>
Expected unfunded accrued liability July 1, 2021	651,728,286
Expected unfunded accrued liability July 1, 2022	
Expected unfunded accrued liability July 1, 2021	651,728,286
Expected gross normal cost July 1, 2021	15,319,973
City and employee contributions for 2021-2022	(60,734,025)
Interest at 7.25% to July 1, 2022	<u>45,809,203</u>
Expected unfunded accrued liability July 1, 2022	652,123,437
Actuarial (gain) / loss July 1, 2022	<u>(13,764,246)</u>
Actual unfunded accrued liability July 1, 2022, prior to plan provision, assumption and method changes	638,359,191
Sources of (gain) / loss	
Assets	(9,231,000)
Liabilities	<u>(4,533,000)</u>
Total (gain) / loss (rounded to nearest \$1,000)	(13,764,000)
Assumption and method changes since prior valuation	<u>37,829,816</u>
Actual unfunded accrued liability July 1, 2022, after plan provision, assumption and method changes	676,189,007



Development of Asset Values

Summary of Fund Activity		
	Market Value	Actuarial Value
1. Beginning value of assets July 1, 2021		
Trust assets	\$392,272,712	\$347,090,974
2. Contributions		
City contributions during year	53,093,107	53,093,107
Employee contributions during year	7,640,918	7,640,918
Total for plan year	60,734,025	60,734,025
3. Disbursements		
Benefit payments during year	69,394,923	69,394,923
Administrative expenses during year	197,051	197,051
Total for plan year	69,591,974	69,591,974
4. Net investment return		
Interest and dividends	4,059,614	N/A
Realized and unrealized gain / (loss)	(46,135,355)	N/A
Expected return	N/A	28,699,244
Recognized gain / (loss)	N/A	(6,214,641)
Required adjustment due to corridor	N/A	0
Reversal of prior year required adjustment	N/A	0
Investment-related expenses	(1,994,813)	N/A
Total for plan year	(44,070,554)	22,484,603
5. Ending value of assets July 1, 2022		
Trust assets: (1) + (2) - (3) + (4)	339,344,209	360,717,628
6. Approximate rate of return	-11.1%	6.4%



Relationship of Actuarial Value to Market Value

1. Market value 7/1/2022	\$339,344,209
2. Gain / (loss) not recognized in actuarial value 7/1/2022	<u>(21,373,419)</u>
3. Preliminary actuarial value 7/1/2022: (1) - (2)	360,717,628
4. Preliminary actuarial value as a percentage of market value: (3) ÷ (1)	106.3%
5. Gain / (loss) recognized for corridor minimum / maximum	N/A
6. Actuarial value 7/1/2022 after corridor minimum / maximum: (3) + (5)	360,717,628
7. Actuarial value as a percentage of market value: (6) ÷ (1)	106.3%

Development of Market Value Gain / Loss for 2021-2022 Plan Year

1. Market value 7/1/2021	\$392,272,712
2. City contributions	53,093,107
3. Employee contributions	7,640,918
4. Benefit payments	69,394,923
5. Administrative expenses	197,051
6. Expected return at 7.25%	<u>28,699,244</u>
7. Expected value 7/1/2022: (1) + (2) + (3) - (4) - (5) + (6)	412,114,007
8. Market value 7/1/2022	<u>339,344,209</u>
9. Market value gain / (loss) for 2021-2022 plan year: (8) - (7)	(72,769,798)

Recognition of Gain / Loss in Actuarial Value

Year	(a) Gain / (loss)	(b) Total recognized as of 7/1/2021	(c) Recognized in current year: 20% of (a)	(d) Total recognized as of 7/1/2022: (b) + (c)	(e) Not recognized as of 7/1/2022: (a) - (d)
2017-2018	(\$17,574,995)	(\$14,059,996)	(\$3,514,999)	(\$17,574,995)	\$0
2018-2019	(2,240,241)	(1,344,144)	(448,048)	(1,792,192)	(448,049)
2019-2020	(1,916,844)	(766,738)	(383,369)	(1,150,107)	(766,737)
2020-2021	63,428,675	12,685,735	12,685,735	25,371,470	38,057,205
2021-2022	(72,769,798)	0	<u>(14,553,960)</u>	(14,553,960)	<u>(58,215,838)</u>
Total			(6,214,641)		(21,373,419)



Summary of Fund Activity		
	Market Value	Actuarial Value
1. Beginning value of assets July 1, 2020		
Trust assets	\$325,990,716	\$331,776,985
2. Contributions		
City contributions during year	39,595,014	39,595,014
Employee contributions during year	7,844,198	7,844,198
Total for plan year	47,439,212	47,439,212
3. Disbursements		
Benefit payments during year	67,696,286	67,696,286
Administrative expenses during year	256,109	256,109
Total for plan year	67,952,395	67,952,395
4. Net investment return		
Interest and dividends	3,709,660	N/A
Realized and unrealized gain / (loss)	84,446,763	N/A
Expected return	N/A	23,366,504
Recognized gain / (loss)	N/A	12,460,668
Required adjustment due to corridor	N/A	0
Reversal of prior year required adjustment	N/A	0
Investment-related expenses	(1,361,244)	N/A
Total for plan year	86,795,179	35,827,172
5. Ending value of assets July 1, 2021		
Trust assets: (1) + (2) - (3) + (4)	392,272,712	347,090,974
6. Approximate rate of return	26.9%	10.9%



Relationship of Actuarial Value to Market Value

1. Market value 7/1/2021	\$392,272,712
2. Gain / (loss) not recognized in actuarial value 7/1/2021	45,181,738
3. Preliminary actuarial value 7/1/2021: (1) - (2)	347,090,974
4. Preliminary actuarial value as a percentage of market value: (3) ÷ (1)	88.5%
5. Gain / (loss) recognized for corridor minimum / maximum	N/A
6. Actuarial value 7/1/2021 after corridor minimum / maximum: (3) + (5)	347,090,974
7. Actuarial value as a percentage of market value: (6) ÷ (1)	88.5%

Development of Market Value Gain / Loss for 2020-2021 Plan Year

1. Market value 7/1/2020	\$325,990,716
2. City contributions	39,595,014
3. Employee contributions	7,844,198
4. Benefit payments	67,696,286
5. Administrative expenses	256,109
6. Expected return at 7.25%	23,366,504
7. Expected value 7/1/2021: (1) + (2) + (3) - (4) - (5) + (6)	328,844,037
8. Market value 7/1/2021	392,272,712
9. Market value gain / (loss) for 2020-2021 plan year: (8) - (7)	63,428,675

Recognition of Gain / Loss in Actuarial Value

Year	(a) Gain / (loss)	(b) Total recognized as of 7/1/2020	(c) Recognized in current year: 20% of (a)	(d) Total recognized as of 7/1/2021: (b) + (c)	(e) Not recognized as of 7/1/2021: (a) - (d)
2016-2017	\$20,606,749	\$16,485,400	\$4,121,349	\$20,606,749	\$0
2017-2018	(17,574,995)	(10,544,997)	(3,514,999)	(14,059,996)	(3,514,999)
2018-2019	(2,240,241)	(896,096)	(448,048)	(1,344,144)	(896,097)
2019-2020	(1,916,844)	(383,369)	(383,369)	(766,738)	(1,150,106)
2020-2021	63,428,675	0	12,685,735	12,685,735	50,742,940
Total			12,460,668		45,181,738

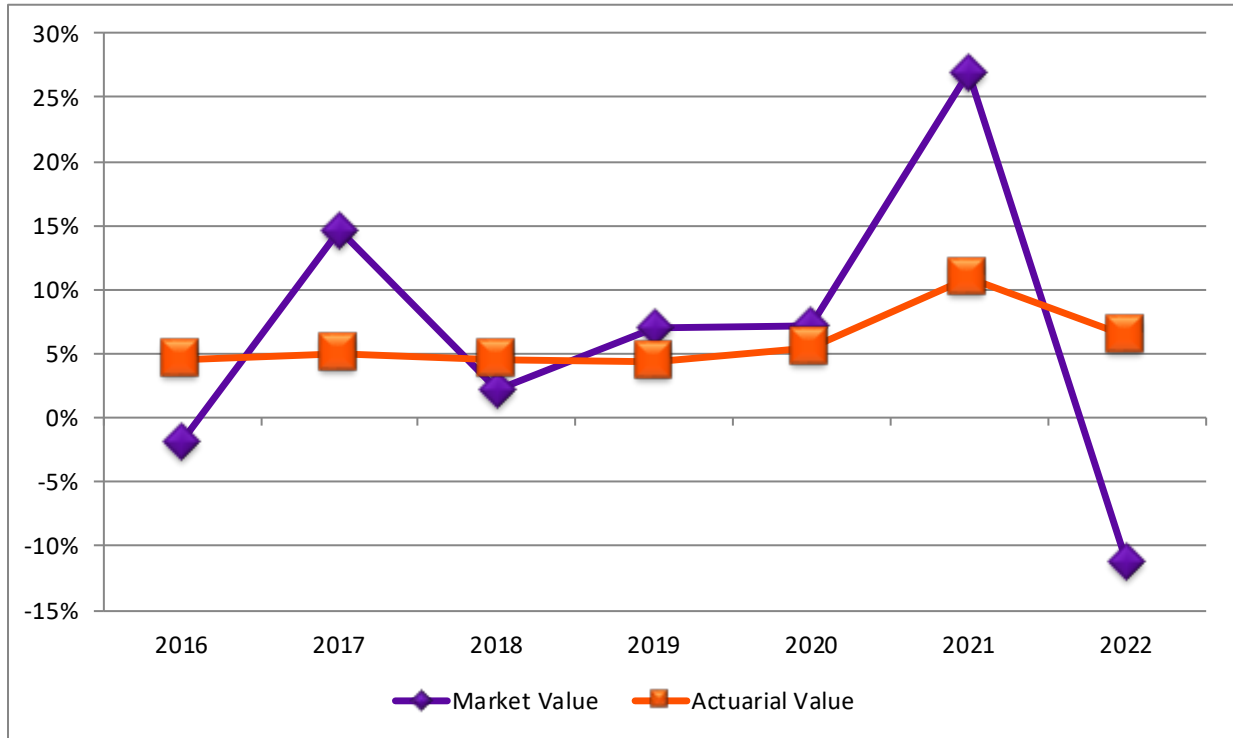


Rate of Return on Market Value of Assets				
Period Ending	Average Annual Effective Rate of Return			
	1 Year	3 Years	5 Years	10 Years
June 30				
2013	15.6%	10.8%	5.1%	6.5%
2014	19.9%	11.0%	12.9%	7.1%
2015	1.8%	12.2%	10.7%	6.4%
2016	-1.8%	6.3%	6.5%	5.5%
2017	14.6%	4.7%	9.7%	5.3%
2018	2.2%	4.8%	7.0%	6.1%
2019	7.0%	7.8%	4.6%	8.7%
2020	7.1%	5.4%	5.7%	8.2%
2021	26.9%	13.3%	11.3%	8.8%
2022	-11.1%	6.5%	5.7%	7.7%

Rate of Return on Actuarial Value of Assets				
Period Ending	Average Annual Effective Rate of Return			
	1 Year	3 Years	5 Years	10 Years
June 30				
2013	4.9%	3.0%	2.3%	N/A
2014	13.1%	6.2%	4.5%	N/A
2015	6.8%	8.2%	5.7%	N/A
2016	4.5%	8.1%	6.0%	N/A
2017	5.1%	5.5%	6.8%	N/A
2018	4.6%	4.7%	6.8%	4.5%
2019	4.3%	4.6%	5.0%	4.8%
2020	5.5%	4.8%	4.8%	5.3%
2021	10.9%	6.9%	6.1%	6.0%
2022	6.4%	7.6%	6.3%	6.6%



Actual Rate of Return on Assets





Target Allocation and Expected Rate of Return July 1, 2022

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*	Weighting
US Large Cap Equity	15.50%	4.24%	0.66%
US Small/Mid Cap Equity (Smid)	26.00%	4.49%	1.17%
AC World ex-US All Cap Equity Unhedged	15.00%	4.18%	0.63%
US Aggregate FI	20.00%	1.39%	0.28%
US Cash	3.50%	0.30%	0.01%
US Real Estate - Core	6.00%	4.70%	0.28%
Private Equity - Total	10.00%	7.27%	0.73%
Hedge Funds - Macro	4.00%	4.13%	0.17%
	100.00%		3.93%
Long-Term Inflation Expectation			2.50%
Long-Term Expected Nominal Return			6.43%

**Long-Term Real Returns are provided by Raymond James. The returns are geometric means.*

The long-term expected rate of return on pension plan investments was determined using a building block method in which best-estimate ranges of expected future real rates of return are developed. Best estimates of the real rates of return for each major asset class are included in the pension plan's target asset allocation.

The information above is based on geometric means and does not reflect additional returns through investment selection, asset allocation and rebalancing. An expected rate of return of 6.90% was used.



Amortization of Unfunded Liability

Schedule of Amortization Bases				
	Date established	Amortization installment	Years remaining	Present value of remaining installments as of July 1, 2022
2022 base	July 1, 2022	46,129,533	22	676,189,007



Member Data

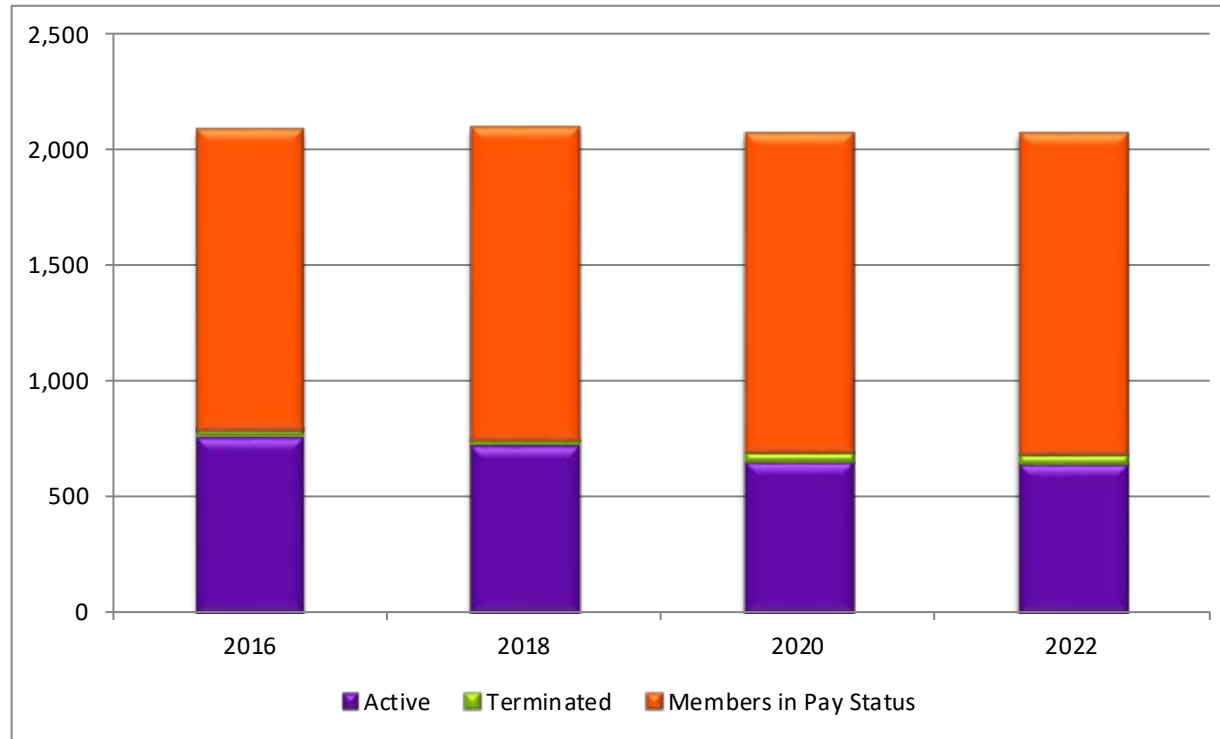
The data reported by the Plan Sponsor for this valuation includes 642 active employees who met the Plan's minimum age and service requirements as of July 1, 2022.

Member Data					
	Active	Terminated vested	Due refund of contributions	Members in pay status	Total
Total members July 1, 2020	652	4	32	1,379	2,067
Adjustments	0	0	0	0	0
Retirements	-70	0	N/A	+70	0
Disabilities	-7	N/A	N/A	+7	0
Terminations					
Vested	0	0	N/A	N/A	0
Lump sum payments	-11	0	-9	N/A	-20
Due contributions only	-6	N/A	+6	N/A	0
End of benefit	N/A	N/A	N/A	-2	-2
Deaths					
With death benefit	-1	0	0	-33	-34
Without death benefit	-2	-1	0	-73	-76
Transfers	0	0	0	N/A	0
Rehires	+1	0	-1	N/A	0
New beneficiaries	N/A	N/A	N/A	+42	+42
New entrants	+86	N/A	+7	N/A	+93
Total members July 1, 2022	642	3	35	1,390*	2,070

* Includes 68 alternate payees receiving benefits



Member Counts by Status





Member Data				
	Active	Terminated vested	Due refund of contributions	Members in pay status
Average age				
July 1, 2020	38.8	51.5	35.2	66.6
July 1, 2022	38.3	50.6	36.2	66.5
Average service				
July 1, 2020	9.8	N/A	N/A	N/A
July 1, 2022	9.3	N/A	N/A	N/A
Covered employee payroll				
July 1, 2020	\$59,157,790	N/A	N/A	N/A
July 1, 2022	60,718,832	N/A	N/A	N/A
Total annual benefits				
July 1, 2020	N/A	\$169,795	N/A	\$64,593,445
July 1, 2022	N/A	156,939	N/A	69,912,793



Active Member Count by Age and Years of Service

Attained age	Completed Years of Credited Service										
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and over	All years
Under 25	8	3									11
25 to 29	24	42	15								81
30 to 34	16	34	101	12							163
35 to 39	10	24	61	50	11						156
40 to 44	3	9	25	26	23	5					91
45 to 49	1	2	15	20	10	20					68
50 to 54		1	7	11	3	18	4				44
55 to 59	1		2	5	4	8	1				21
60 to 64			1	2	1	3					7
65 to 69											
70 & over											
All ages	63	115	227	126	52	54	5				642



Expected Benefit Payments from Trust Fund

An important consideration in formulating short-term or intermediate-term investment policy is the need for liquidity to meet the payment requirements of the Plan. The Plan's investment advisors may wish to compare expected benefit payments and expenses with anticipated cash income from investments and employer contributions.

The table below presents projected annual benefit payments for the next ten plan years. The following assumptions are reflected in this table:

- Retirements among active participants will occur at the valuation's assumed retirement date.
- Benefits will continue to accrue based on the current Plan.
- Plan salaries will increase in accordance with the valuation's assumption.
- Benefits will be paid monthly.
- Participants will receive the normal form of benefit.

Differences between actual experience and that assumed will affect the pattern of benefit payments.

Participant categories reflect status as of July 1, 2022.

Year	Active as of July 1, 2022	Retired and Terminated as of July 1, 2022	Total Benefit Payments
2022	\$1,483,000	\$70,103,000	\$71,586,000
2023	3,338,000	69,534,000	72,872,000
2024	5,270,000	69,275,000	74,545,000
2025	7,117,000	68,938,000	76,055,000
2026	8,897,000	68,535,000	77,432,000
2027	10,741,000	68,050,000	78,791,000
2028	12,958,000	67,514,000	80,472,000
2029	15,190,000	66,932,000	82,122,000
2030	17,272,000	66,209,000	83,481,000
2031	18,931,000	65,412,000	84,343,000



Long Range Forecast

Projected Values as of the Valuation Date				Cash Flows Projected to the Following Fiscal Year				
Valuation Date	Market Value of Fund - Beginning of Fiscal Year	City Contribution (ADEC) *	Employee Contributions	Estimated Benefit Payments	Estimated Administrative Expense	Expected Net Cash Flow	Estimated Investment Earnings (@ 6.90%)	Market Value of Fund - End Fiscal Year
6/30/2023	\$339,344,209	\$53,274,000	\$6,862,000	\$71,586,000	\$197,000	(\$11,647,000)	\$24,545,000	\$352,242,000
6/30/2024	352,242,000	55,828,000	7,034,000	\$72,872,000	202,000	(10,212,000)	25,557,000	367,587,000
6/30/2025	367,587,000	57,224,000	7,210,000	\$74,545,000	207,000	(10,318,000)	26,653,000	383,922,000
6/30/2026	383,922,000	58,655,000	7,390,000	\$76,055,000	212,000	(10,222,000)	27,824,000	401,524,000
6/30/2027	401,524,000	60,121,000	7,575,000	\$77,433,000	217,000	(9,954,000)	29,090,000	420,660,000
6/30/2028	420,660,000	61,624,000	7,764,000	\$78,791,000	222,000	(9,625,000)	30,465,000	441,500,000
6/30/2029	441,500,000	63,165,000	7,958,000	\$80,473,000	228,000	(9,578,000)	31,949,000	463,871,000
6/30/2030	463,871,000	64,744,000	8,157,000	\$82,121,000	234,000	(9,454,000)	33,542,000	487,959,000
6/30/2031	487,959,000	66,363,000	8,361,000	\$83,481,000	240,000	(8,997,000)	35,267,000	514,229,000
6/30/2032	514,229,000	68,022,000	8,570,000	\$84,343,000	246,000	(7,997,000)	37,162,000	543,394,000
6/30/2033	543,394,000	69,723,000	8,784,000	\$85,027,000	252,000	(6,772,000)	39,265,000	575,887,000
6/30/2034	575,887,000	71,466,000	9,004,000	\$85,518,000	258,000	(5,306,000)	41,608,000	612,189,000
6/30/2035	612,189,000	73,253,000	9,229,000	\$85,909,000	264,000	(3,691,000)	44,220,000	652,718,000
6/30/2036	652,718,000	75,084,000	9,460,000	\$86,270,000	271,000	(1,997,000)	47,127,000	697,848,000
6/30/2037	697,848,000	76,961,000	9,697,000	\$86,927,000	278,000	(547,000)	50,345,000	747,646,000
6/30/2038	747,646,000	78,885,000	9,939,000	\$87,839,000	285,000	700,000	53,880,000	802,226,000
6/30/2039	802,226,000	80,857,000	10,187,000	\$88,613,000	292,000	2,139,000	57,752,000	862,117,000
6/30/2040	862,117,000	82,878,000	10,442,000	\$89,515,000	299,000	3,506,000	61,990,000	927,613,000
6/30/2041	927,613,000	84,950,000	10,703,000	\$90,326,000	306,000	5,021,000	66,621,000	999,255,000
6/30/2042	999,255,000	87,074,000	10,971,000	\$90,784,000	314,000	6,947,000	71,692,000	1,077,894,000
6/30/2043	1,077,894,000	89,251,000	11,245,000	\$91,000,000	322,000	9,174,000	77,257,000	1,164,325,000



Description of Actuarial Methods

Asset Valuation Method

The Actuarial Value of assets used in the development of plan contributions phases in the recognition of differences between the actual return on Market Value and expected return on Market Value over a 5-year period at 20% per year.

Actuarial Cost Method

Changes in Actuarial Cost Method: None.

Description of Current Actuarial Cost Method: Entry Age Normal (level percentage of salary)

Normal Cost: Under this method, the total normal cost is the sum of amounts necessary to fund each active member's normal retirement benefit if paid annually from entry age to assumed retirement age. Entry age is the age at which the employee would have been first eligible for the plan, if it had always been in effect. The normal cost for each participant is expected to remain a level percentage of the employee's salary. The normal cost for the plan is the difference between the total normal cost for the year and the anticipated member contributions for that year.

Past Service Liability: The present value of future benefits that relates to service before the valuation date is the total past service liability. The unfunded past service liability is the difference between the total past service liability and any assets (including accumulated member contributions).

This amount is amortized over 22 years on a closed basis.

Experience Gains and Losses: All experience gains and losses (the financial effect of the difference between the actual experience during the prior period and the result expected by the actuarial assumptions for that prior period) appear directly in the past service liability and are amortized at the same rate the plan is amortizing the remaining unfunded past service liability.

In addition, an annual 2.50% amortization increase rate was assumed.



Description of Actuarial Assumptions

Changes in Actuarial Assumptions

The valuation reflects changes in the actuarial assumptions listed below. (The assumptions used before and after these changes are more fully described in the next section.)

- Investment rate of return
- Mortality

The assumptions indicated were changed to represent the Enrolled Actuary's current best estimate of anticipated experience of the plan.

Investment rate of return (net of investment-related expenses)

6.90%. (Prior: 7.25%)

Rate of amortization payment increase

2.50%.

Inflation

2.50%.

This assumption is based on long term historical inflation numbers. While near term averages have been lower, we do not believe this trend will continue indefinitely and expect that there will be a reversion to the long-term average.

Salary increases

Age	Rate
20	9.75%
25	9.75%
30	7.50%
35	3.40%
40	3.00%
45	2.95%
50	2.75%
>=55	2.50%

Implicit inflation assumption is 2.50%.

The actuarial assumption in regards to rates of salary increases shown above are based on the results of an actuarial experience study for the period July 1, 2014 through June 30, 2020.

Overtime, longevity pay, and private duty

37% load on budgeted pay for Police and 37% load on budgeted pay for Fire.

The actuarial assumption shown above is based on the results of an actuarial experience study for the period July 1, 2014 through June 30, 2020.



Mortality

Pub-2010 Public Retirement Plans Amount-Weighted Mortality Table for Public Safety, projected to the valuation date with Scale MP-2021.

Prior: Pub-2010 Public Retirement Plans Amount-Weighted Mortality Table for Public Safety, projected to the valuation date with Scale MP-2020.

Mortality improvement

Projected to date of decrement using Scale MP-2021 (generational mortality).

Prior: Projected to date of decrement using Scale MP-2020 (generational mortality).

We have selected this mortality assumption because it is based on the latest published public retirement mortality study released by the Society of Actuaries.

The mortality assumption was updated to better reflect anticipated experience.

The change in assumption increased liabilities by approximately 0.1%.

Retirement age

Years of Service	Rate*
10-20	7%
20	30%
21-29	25%
30	30%
31-39	20%
40	100%

*100% are assumed to retire at age 65 or greater.

The actuarial assumption in regards to rates of retirement shown above is based on the results of an actuarial experience study for the period 2014 through 2020.

Termination prior to retirement

Age	Years of Service			
	< 1	1	2	3+
20	5.96%	5.00%	4.20%	3.72%
25	5.56%	4.50%	3.70%	2.72%
30	5.16%	4.00%	3.20%	2.02%
35	4.76%	3.56%	2.76%	1.58%
40	4.36%	3.16%	2.36%	1.30%
45	3.96%	2.82%	2.02%	1.10%
50	3.56%	2.52%	1.72%	0.90%
>=55	3.00%	2.00%	1.00%	0.00%

The actuarial assumption in regards to rate of termination shown above is based on a standard table modified for certain plan features such as eligibility for full and early retirement where applicable and input from the plan sponsor.

The actuarial assumption in regards to rates of termination shown above is based on the results of an actuarial experience study for the period 2014 through 2020.



Disability

The 1985 Disability Pension Study, Class 4 hazardous occupations.

The actuarial assumption in regards to rates of decrement shown above are based on standard table. We reviewed the available experience and reflected it in the assumption.

Sick leave credit

Members who reach retirement or become disabled are assumed to purchase 3.5 years of additional credited service.

The actuarial assumption in regards to sick leave credit shown above is based on the results of an actuarial experience study for the period 2014 through 2020.

Administrative expenses

The estimate is based on actual expenses paid from the trust in the prior year. Estimated expenses are added to annual budget estimates at the time of their preparation.

Cost of living increases

Annual Cap	COLA	Police	Fire
4.00%	1.15%	Hired prior to March 29, 1997	Hired prior to April 23, 2004
3.00%	1.05%	Hired between April 23, 2004 and August 27, 2013	
2.00%	0.85%	Hired between March 29, 1997 and March 28, 2012	
1.50%	0.65%	Hired after March 28, 2012	Hired after August 27, 2013

The actuarial assumption in regards to cost of living increases shown above is based on the results of an actuarial experience study for the period 2014 through 2020.

Percent of active employees married

80% of male employees and 70% of female employees assumed married.

Spouse's age

Husbands are assumed to be 2 years older than wives.

COLA buyout assumption

40% of retiring employees are assumed to elect the COLA buyout upon retirement.



Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan. It is not intended to be, nor should it be interpreted as a complete statement of all plan provisions. To the extent that this summary does not accurately reflect the plan provisions, then the results of this valuation may not be accurate.

Effective Date

January 1, 1958 and dates of subsequent amendments.

Plan Year

July 1 through June 30.

Eligibility

Automatic for policemen and firemen hired after December 31, 1957.

Employee Contributions

11.5% for Fire after July 1, 2014.

12% for Police effective after December 18, 2012.

10.0% for Police effective July 1, 2010.

9.75% for Police effective July 1, 2006.

9.25% for Police effective November 8, 2004.

8.75% of regular and premium pay plus:

for Police - 4.8% of private duty pay effective July 1, 2006.

3.8% of private duty pay after January 1, 1995.

for Fire - 4.375% of private duty pay after April 1, 1995.

6¾% of all earnings after June 30, 1985.

6½% of all earnings between July 1, 1984 and June 30, 1985.

6% of all earnings prior to July 1, 1984.

Continuous Service

Uninterrupted employment with the Police or Fire Departments. Also, members may purchase up to 5 years sick leave credit at retirement.

Service Retirement Date

20 years of continuous service. 25 years for Police hired after May 28, 2012 and Fire hired after August 27, 2013.

Mandatory Retirement Date

Police: Age 67 with no service requirement.

Fire: Age 65 with no service requirement.



Final Average Pay

Average total annual earnings for the 4 highest plan years of earnings (was 5 years for Police prior to July 1, 2004 and for Fire prior to July 1, 2006), or budgeted annual salary at time of retirement, whichever is greater. Total annual earnings includes 50% of extra duty compensation earned on and after July 1, 1994. For Police hired after November 1, 2009, and for Fire hired after August 27, 2013, earnings include only base wages for pension purposes.

For Police (effective July 1, 2004): In consideration for those employees who at the time of retirement have a four (4) year average that is not more than the employee's base salary, said employee's total annual earnings shall be the equivalent of the annual salary of an employee's holding the next higher rank to that held by the retiring employee prior to retirement. This provision shall automatically sunset (no longer exist) at 11:59 p.m. on July 15, 2007. For purposes of calculating the four (4) year average, only plainclothes differential pay, overtime and extra duty pay will be added to the regular pay.

Service Retirement Benefits

For members actively employed after June 30, 1994: 2½% (2% for Police hired after March 28, 2012 and for Fire hired after August 27, 2013) of final average pay for each year of service and fraction thereof up to 20 years plus 3% (2.5% for Police hired after March 28, 2012 and for Fire hired after August 27, 2013) of final average pay for each year of service and fraction thereof in excess of 20 years all subject to a maximum of 80% (effective July 1, 2004: 83% for Police retiring with at least 30 years of actual service, if cash in 30 sick days from the sick leave payout maximum at retirement of final average pay), and 70% for Police hired after May 28, 2012).

January 1, 1993 (June 30, 1993 for Fire) through June 30, 1994: 2½% times final average pay times years of service, up to a maximum of 75% of final average pay.

July 1, 1987 through January 1, 1993 (June 30, 1993 for Fire): 2% of final average pay for each year of service and fraction thereof up to 20 years plus 3% of final average pay for each year of service and fraction thereof in excess of 20 all subject to a maximum of 70% of final average pay.

Prior to July 1, 1987: 2% times final average pay times years of service subject to a maximum of 70% of final average pay.

Disability

For a non-service connected disability 5 years of continuous service is required in order to receive a disability benefit of 50% of final average pay. For service connected disability there is no service requirement and there is a minimum disability benefit of 50% of the employee's rate of pay at time of disability.

After August 31, 1984 policemen and firemen who retire on disability with less than 13 years of service will have their disability benefits reduced if their earnings while on disability exceed a certain level. No reductions will apply after the attainment of age 65.

Death Benefits

The monthly benefits payable to the widow and/or children are summarized as follows:

Pre-retirement Death Benefit:

1. Widow only - 50% (25% prior to July 1, 1987) of rate of pay being received at date of death;
2. Widow and one child - 60% (35% prior to July 1, 1987) of rate of pay being received at date of death; or
3. Widow and two or more children - 70% (45% prior to July 1, 1987) of rate of pay being received at date of death.

Special benefits for service connected deaths (equal to 100% of final salary less Worker's Compensation payments) are payable out of the City's General Fund.



Death Benefits (cont.)

Post-retirement Death benefit:

1. Widow only - for members actively employed after June 30, 1994: 65% of pension being paid at date of death - for other members: 50% of pension being paid at date of death;
2. Widow and one child - for members actively employed after June 30, 1994: 75% of pension being paid at date of death - for other members: 70% of pension being paid at date of death; or
3. Widow and two or more children - for members actively employed after June 30, 1994: 85% of pension being paid at date of death for other members: 90% of pension being paid at date of death.

In any event, the total cumulative benefit payments paid out of the Pension fund will amount to no less than the total contributions made by the employee to the plan.

Termination Benefits

Subject to the following requirements, a benefit equal to 2% times average total earnings for the 10 highest plan years of earnings times years of actual service will be payable starting on the date the terminated member would have become eligible for a normal service pension:

1. Completed 10 years of continuous service.
2. Elected to leave his accumulated contributions in the plan.

All other members will receive their accumulated employee contributions at their date of termination.

Cost of Living Adjustment

Policemen and Firemen, who retire after June 30, 1984 with a service retirement benefit which requires at least 20 years (25 years for members who retire before July 1, 1994) of service or who retire after June 30, 1984 as a result of a service connected disability with 20 years of service, and their eligible survivors will have their benefits increased or decreased every other January 1st starting on January 1, 1987 according to the U.S. Consumer Price Index subject to the following restrictions:

1. each increase or decrease will be limited to 4% (2% for Police hires after March 28, 1997 and 1.5% for Police hires after March 28, 2012), (3% for Fire hired after April 23, 2004 and 1.5% for Fire hired after August 27, 2013);
2. the overall increase in benefits will be limited to 25% (20% for members who retired before July 1, 1994); and
3. the cost of living adjustments will never reduce the benefit below its original level.
4. Accumulated maximum of 25% for Police retirees hired prior to March 29, 1997, and a maximum of 10% applies for such Police retirees hired after March 29, 1997. Accumulated maximum of 15% for Fire retirees hired after April 23, 2004 and 10% for Fire hired after August 27, 2013.
5. The retiree has the option to receive 40% of the actuarial value of the Cost of Living feature in exchange for forgoing the COLA.

Sick Leave

Policemen and Firemen may exchange up to 150 days of sick leave for pension credit. (30 days equal one year of pension service.)