

CITY OF MERIDEN FIRE EMPLOYEES' PENSION PLAN

ACTUARIAL VALUATION REPORT

JULY 1, 2020







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 2022 and 2023	2
Liability Experience During Period Under Review	2
Asset Experience During Period Under Review	3
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
Determination of Actuarial Gain/Loss	10
Development of Asset Values	11
Target Allocation and Expected Rate of Return	15
Amortization of Unfunded Liability	16
Member Data	17
Description of Actuarial Methods	20
Description of Actuarial Assumptions	21
Summary of Plan Provisions	24

Report Prepared By:

Stephen Chykirda
Consulting Actuary
860.856.2102
SChykirda@hhconsultants.com

Kathryn Toyota Actuarial Associate 860.856.2243 KToyota@hhconsultants.com



Executive Summary

	July 1, 2020	July 1, 2018
Number of members		
Active employees	33	41
Terminated vested members	0	0
Retired, disabled and beneficiaries	125	121_
Total	158	162
Covered employee payroll	2,919,557	3,414,245
Average plan salary	88,471	83,274
Actuarial present value of future benefits	94,612,475	93,112,076
Actuarial accrued liability	90,847,192	88,828,673
Plan assets		
Market value of assets	46,171,844	48,357,463
Actuarial value of assets	52,791,835	53,617,631
Unfunded accrued liability	38,055,357	35,211,042
Funded ratio	58.1%	60.4%
Actuarially determined employer contribution (ADEC)		
Fiscal year ending	2022	2020
ADEC	3,794,759	3,514,375
Fiscal year ending	2023	2021
ADEC	3,794,759	3,514,375



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,

Ultimate cost = Benefits Paid + Expenses Incurred - Investment Return - 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, 2020 valuation produces the contributions for the fiscal years ending 2022 and 2023.

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 investment rate of return assumption decreased from 7.375% to 7.25% and the inflation assumption decreased from 2.60% to 2.40%.

Cash Contribution for Fiscal Years Ending 2022 and 2023

The City cost is: 2022 Fiscal Year 2023 Fiscal Year

\$3,794,759 \$3,794,759

Liability Experience During Period Under Review

The plan experienced a net actuarial loss on liabilities of \$777,475 or approximately 0.9% of the liability since the prior valuation.



Asset Experience During Period Under Review

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

2019 Fiscal Year 2020 Fiscal Year

Market Value Basis	6.1%	1.1%
Actuarial Value Basis	5.0%	4.2%

The Actuarial Value of assets, rather than the Market Value, is used to determine plan contributions. The Actuarial Value spreads the asset volatility by recognizing 20% of the difference each year, 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, 2020	July 1, 2018
Actuarial accrued liability for members currently in pay status		
as a percentage of the total actuarial accrued liability	80.9%	77.2%

- 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, 2020
Duration of benefit payments using an investment rate of return of 7.25%	11.1 years

• 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, 2020	July 1, 2018
Ratio of market value of assets to covered payroll	15.8	14.2

• 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.



Risks to Assess

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

	Fiscal Year Ending 2022	Fiscal Year Ending 2023
Increase in actuarially determined employer contribution (ADEC)	41,146	41,146

• 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
2020	7.250%	N/A	50.8%	N/A
2019	N/A	1.1%	N/A	13.4%
2018	7.375%	6.1%	54.4%	12.8%
2017	N/A	10.5%	N/A	12.9%
2016	7.750%	9.9%	52.2%	13.4%



Certification

This report presents the results of the July 1, 2020 Actuarial Valuation for City of Meriden Fire Employees' Pension Plan (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, 2022 and June 30, 2023. 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.

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.

Stephen Chykirda, ASA, ACA, MAAA Enrolled Actuary 20-07517

March 2, 2021

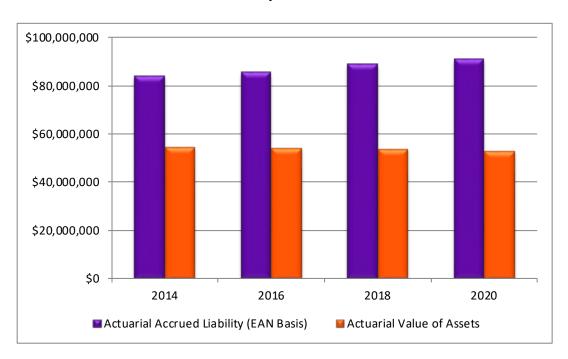


Development of Unfunded Accrued Liability and Funded Ratio

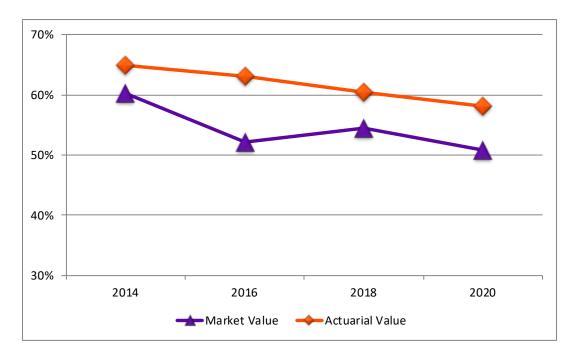
	July 1, 2020	July 1, 2018
Actuarial accrued liability for inactive members		
Retired pensioners	\$46,725,818	\$41,431,797
Disabled pensioners	17,892,777	19,255,384
Beneficiaries in payment status	8,902,245	7,855,686
Terminated vested members	0	0
Total	73,520,840	68,542,867
Actuarial accrued liability for active employees	17,326,352	20,285,806
Total actuarial accrued liability	90,847,192	88,828,673
Actuarial value of assets	52,791,835	53,617,631
Unfunded accrued liability	38,055,357	35,211,042
Funded ratio	58.1%	60.4%



Actuarial Accrued Liability vs. Actuarial Value of Assets



Funded Ratio



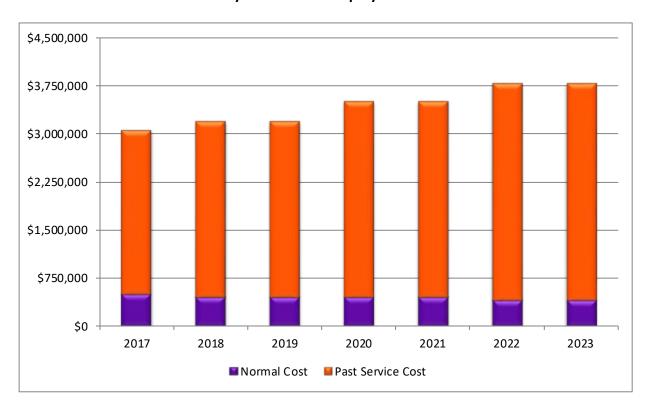


Determination of Normal Cost and Actuarially Determined Employer Contribution

	July 1, 2020		July 1, 2	2018
	Cost	Percent of payroll	Cost	Percent of payroll
Gross normal cost	\$541,612	18.1%	\$616,549	17.5%
Estimated employee contributions	(180,005)	-6.0%	(210,917)	-6.0%
Estimated administrative expenses	28,000	0.9%	32,000	0.9%
City's normal cost	389,607	13.0%	437,632	12.4%
Amortization of unfunded accrued liability	3,274,647	109.1%	2,953,905	84.1%
Contribution before adjustment as of the valuation date	3,664,254	122.1%	3,391,537	96.5%
Estimated valuation year payroll for actives not yet at 100% assumed retirement age	3,000,090		3,515,276	
Fiscal year ending	2022		2020	
Adjustment for interest and inflation	130,505		122,838	
Actuarially determined employer contribution	3,794,759		3,514,375	
Fiscal year ending	2023		2021	
Adjustment for interest and inflation	0		0	
Actuarially determined employer contribution	3,794,759		3,514,375	



Actuarially Determined Employer Contribution





Determination of Actuarial Gain/Loss

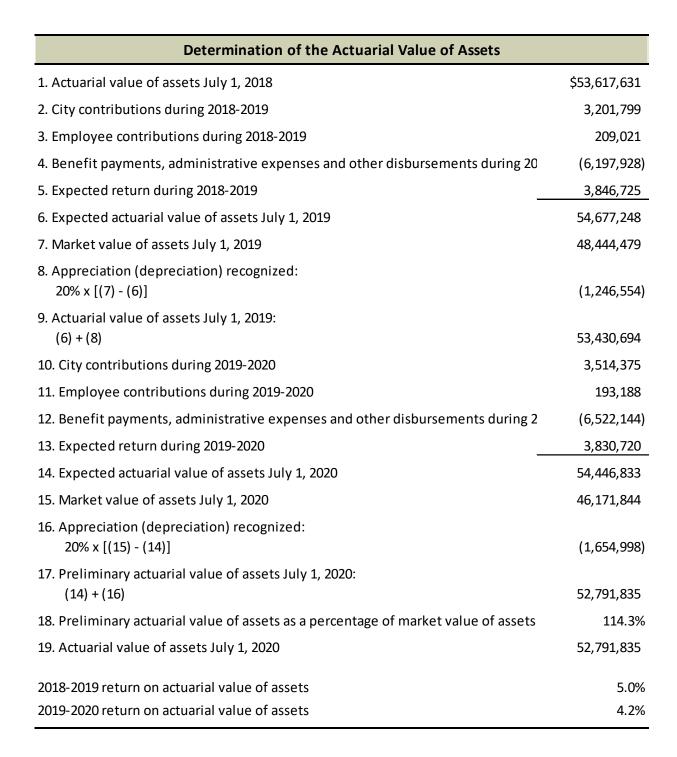
The Actuarial Gain/Loss is the difference between the expected unfunded accrued liability and the actual unfunded accrued liability, without regard to any changes in actuarial methods, actuarial assumptions or plan provisions. This can also be referred to an Experience Gain/Loss, since it reflects the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

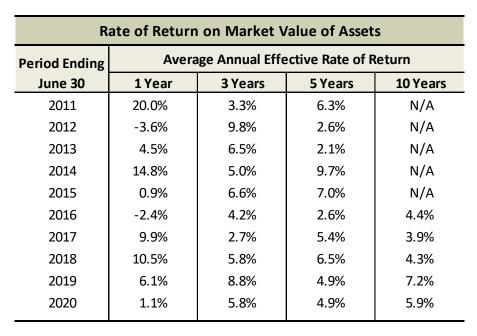
Actuarial Gain / Loss		
Expected unfunded accrued liability July 1, 2020		
Expected unfunded accrued liability July 1, 2019		
Unfunded accrued liability July 1, 2018	\$35,211,042	
Gross normal cost July 1, 2018	648,549	
City and employee contributions for 2018-2019	(3,410,820)	
Interest at 7.375% to July 1, 2019	2,509,922	
Expected unfunded accrued liability July 1, 2019	34,958,693	
Expected unfunded accrued liability July 1, 2020		
Expected unfunded accrued liability July 1, 2019	34,958,693	
Expected gross normal cost July 1, 2019	648,549	
City and employee contributions for 2019-2020	(3,707,563)	
Interest at 7.375% to July 1, 2020	2,479,977	
Expected unfunded accrued liability July 1, 2020	34,379,656	
Actuarial (gain) / loss July 1, 2020	3,669,771	
Actual unfunded accrued liability July 1, 2020, prior to plan provision, assumption and method changes		38,049,427
Sources of (gain) / loss		
Assets	2,892,296	
Liabilities	777,475	
Total (gain) / loss	3,669,771	
Assumption and method changes since prior valuation	_	5,930
Actual unfunded accrued liability July 1, 2020, after plan		
provision, assumption and method changes		38,055,357



Development of Asset Values

Summary of Fund Activity			
	July 1, 2018 - June 30, 2019	July 1, 2019 - June 30, 2020	
1. Beginning market value of assets			
Trust assets	\$48,357,463	\$48,444,479	
2. Contributions			
City contributions during year	3,201,799	3,514,375	
Employee contributions during year	209,021	193,188	
Total for plan year	3,410,820	3,707,563	
3. Disbursements			
Benefit payments during year	6,168,027	6,468,276	
Administrative expenses during year	27,100	27,892	
Other disbursements	2,801	25,976	
Total for plan year	6,197,928	6,522,144	
4. Net investment return			
Interest and dividends	839,720	0	
Net appreciation (depreciation)	2,250,192	568,614	
Investment-related expenses	(215,788)	(26,668)	
Total for plan year	2,874,124	541,946	
5. Ending market value of assets			
Trust assets: (1) + (2) - (3) + (4)	48,444,479	46,171,844	
6. Approximate rate of return	6.1%	1.1%	

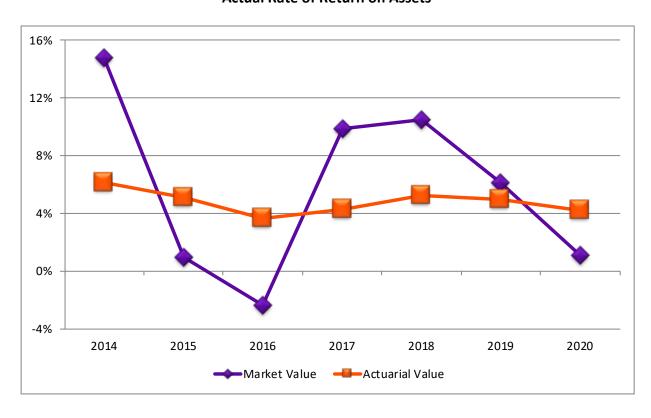




Rate of Return on Actuarial Value of Assets					
Period Ending	Average Annual Effective Rate of Return				
June 30	1 Year 3 Years		5 Years	10 Years	
2011	6.5%	4.2%	5.6%	N/A	
2012	4.6%	5.0%	5.0%	N/A	
2013	4.5%	5.2%	4.4%	N/A	
2014	6.1%	5.1%	5.1%	N/A	
2015	5.1%	5.2%	5.4%	N/A	
2016	3.6%	4.9%	4.8%	5.2%	
2017	4.3%	4.3%	4.7%	4.9%	
2018	5.2%	4.4%	4.9%	4.6%	
2019	5.0%	4.8%	4.6%	4.9%	
2020	4.2%	4.8%	4.5%	4.9%	



Actual Rate of Return on Assets





Target Allocation and Expected Rate of Return July 1, 2020

	Target	Long-Term Expected Real	
Asset Class	Allocation	Rate of Return*	Weighting
Core Fixed Income	15.00%	1.45%	0.22%
Global Fixed Income	5.00%	1.65%	0.08%
U.S. Large Cap Equity	28.00%	4.75%	1.33%
U.S. Small Cap Equity	7.00%	5.15%	0.36%
International Developed Equity	18.00%	5.45%	0.98%
Emerging Markets Equity	7.00%	6.25%	0.44%
Private Real Estate	5.00%	4.10%	0.21%
Hedge Funds	10.00%	3.60%	0.36%
Private Equity	5.00%	7.60%	0.38%
	100.00%		4.36%
Long-Term Inflation Expectation			2.40%
Long-Term Expected Nominal Return			6.76%

^{*}Long-Term Real Returns are provided by Dimeo Schneider Associates, LLC.. 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 7.25% 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, 2020	
2020 base	July 1, 2020	3,274,647	22	38,055,357	



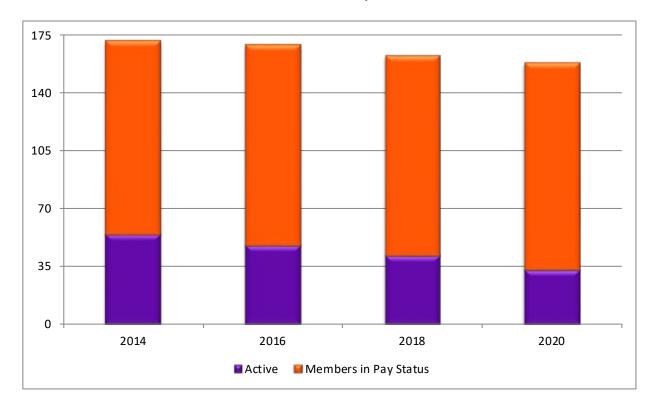
Member Data

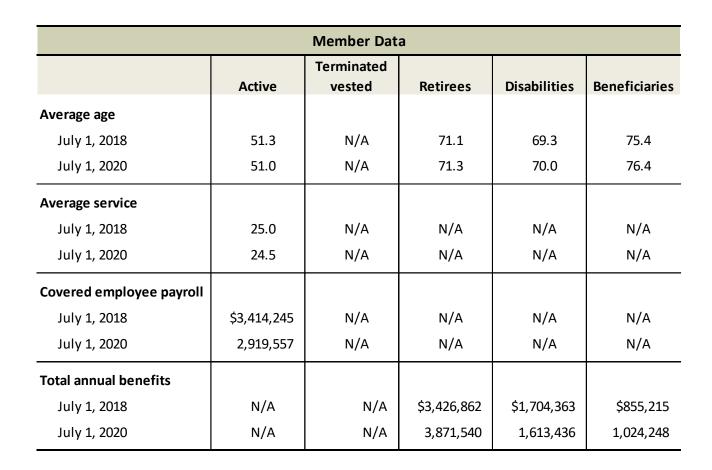
The data reported by the Plan Sponsor for this valuation includes 33 active employees who met the Plan's minimum age and service requirements as of July 1, 2020.

Member Data						
	Active	Terminated vested	Retirees	Disabilities	Beneficiaries	Total
Total members July 1, 2018	41	0	58	32	31	162
Adjustments	0	0	0	0	0	0
Retirements	-8	0	+8	N/A	N/A	0
Disabilities	0	N/A	N/A	0	N/A	0
Terminations						
Vested	0	0	N/A	N/A	N/A	0
Lump sum payments	0	0	N/A	N/A	N/A	0
Due contributions only	0	N/A	N/A	N/A	N/A	0
Deaths						
With death benefit	0	0	-3	-2	0	-5
Without death benefit	0	0	-2	-1	-1	-4
Transfers	0	0	N/A	N/A	N/A	0
Rehires	0	0	N/A	N/A	N/A	0
New beneficiaries	N/A	N/A	N/A	N/A	+5	+5
New entrants	0	N/A	N/A	N/A	N/A	0
Total members July 1, 2020	33	0	61	29	35	158



Member Counts by Status







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 Market Value and Expected Actuarial Value by recognizing 20% of the difference each year.

Actuarial Cost Method

Changes in Actuarial Cost Method: None.

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

<u>Normal Cost</u>: 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.

<u>Past Service Liability</u>: 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.

<u>Experience Gains and Losses:</u> 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.



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.)

- Mortality
- Investment rate of return
- Salary Scale
- Inflation

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 and administrative expenses)

7.25% (Prior: 7.375%)

Salary Scale

Merit table shown below, plus an annual inflation assumption of 2.40% for all groups.

Fire				
Completed Years				
of Service	Rate			
0	7.85%			
1	5.85			
2	3.85			
3-6	1.35			
7-12	1.10			
13-14	0.85			
15+	0.35			

(Prior: Merit table shown below, plus an annual inflation assumption of 2.60% for all groups.)

F*				
Fire				
Completed Years				
of Service	Rate			
0	7.85%			
1	5.85			
2	3.85			
3-6	1.35			
7-12	1.10			
13-14	0.85			
15+	0.35			

The actuarial assumption in regards to salary scale shown above are based on the results of an actuarial experience study for the period July 1, 2008 through July 1, 2014.



Inflation

2.40%. (Prior: 2.60%)

This assumption is consistent with the Social Security Administration's current best estimate of the ultimate long-term (75-year horizon) annual percentage increase in CPI, as published in the 2020 OASDI Trustees Report.

The assumption was changed to better reflect expected experience.

Cost of living increases

Retirement date prior to April 1, 2003: 3.75% Retirement date on or after April 1, 2003: 3.00%

Mortality

Retirement: RP-2014 Adjusted to 2006 Blue Collar Mortality Table, projected to the valuation date with Scale MP-2020.

(Prior Retirement: RP-2014 Adjusted to 2006 Blue Collar Mortality Table, projected to the valuation date with Scale MP-2018.)

Disabilities: RP-2014 Adjusted to 2006 Disabled Mortality Table, projected to the valuation date with Scale MP-2020.

(Prior Disabilities: RP-2014 Adjusted to 2006 Disabled Mortality Table, projected to the valuation date with Scale MP-2018.)

Survivors: RP-2014 Adjusted to 2006 Total Dataset Mortality Table, projected to the valuation date with Scale MP-2020.

(Prior Survivors: RP-2014 Adjusted to 2006 Total Dataset Mortality Table, projected to the valuation date with Scale MP-2018.)

Mortality Improvement

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

(Prior All: Projected to date of decrement using Scale MP-2018 (generational mortality).)

We have selected this mortality assumption because it is based on a recently published pension mortality study released by the Society of Actuaries. The group composition of the Plan is consistent with the collar adjustment selected.

Retirement age

Sample Rates:

Completed Years of Service						
Age	<25	25	30	35		
50	0%	5%	5%	5%		
55	0%	20%	20%	20%		
60	0%	20%	20%	30%		
65	0%	100%	100%	100%		

Termination prior to retirement

None.



Disability

1985 Pension Disability Study Class 4 Unisex Table.

The actuarial assumptions in regards to rates of decrement shown above are based on the results of an actuarial experience study for the period July 1, 2008 through July 1, 2014.

Administrative expenses

We have included estimated administrative expenses in the development of the normal cost.

The estimate is based on actual expenses paid from the trust in the prior year.

Payroll growth

0%.

Percent of active employees married

75%.

Spouse's age

Husbands are assumed to be 3 years older than wives.

Portion of benefit due to Emolument

Active liabilities are loaded 7.3% to reflect the portion of future benefits based on 50% of emoluments.

The assumption changes listed above increased liabilities by about \$6,000.



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.

Plan identification

Single-employer pension plan.

Effective date

Originally effective June 13, 1913.

Amended and restated as of July 1, 2006.

Eligibility for participation

Regular full-time Firefighters hired prior to March 18, 2003, covered under the IAFF, Local 1148 collective bargaining agreement.

Years of service

Completed whole years of employment during which employee has made required contributions.

Base rate of pay

Salary or wages including elective deferrals under 401(k) or Sec. 125, limited by IRC 401(a)(17).

Emoluments

Longevity payments, holiday pay, life insurance and health insurance minus cost share.

Accrued benefit

2.2% of Base Pay times Years of Service up to 20 Years,

plus

50% of current Emoluments.

Normal retirement

Age & Service Requirements:

Earlier of

- 25 Years of Service
- Age 65

Benefit: Accrued Benefit

Termination

Prior to completion of 25 Years of Service: Return of employee contributions plus regular interest.

After completion of 10 Years of Service: Accrued Benefit, payable when Member would have completed 20 Years.



Disability

Eligibility: None if service-related; otherwise completion of 10 Years of Service.

Benefit: 50% of Base Pay plus Emoluments.

Death prior to retirement

Non-service related: Return of employee contributions plus regular interest.

Service-related: Surviving spouse receives 100% of Accrued Benefit as if Officer had 25 Years of Service. Upon attainment of date Officer would have attained 25 Years, spouse's benefit decreases to 50% of the pension amount. Payable until death or remarriage.

Post-retirement death benefit

Surviving spouse receives one-half of amount Member was receiving at time of death. Payable until death or remarriage.

Normal form of retirement benefit

Single life annuity.

Employee contributions

8% of Base Pay, split between Pension and OPEB at the City's discretion, plus Emoluments.

COLA

Retirement prior to January 1, 2003: based on increases in Base Pay for the rank held at retirement.

Retirement after January 1, 2003: active members retiring with at least 25 Years of Service: 3% of Base Pay, excluding Emoluments.