CITY OF MERIDEN FIRE EMPLOYEES' PENSION PLAN

ACTUARIAL VALUATION REPORT

JULY 1, 2018

hooker & holcombe

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Report Prepared By:

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Executive Summary

	July 1, 2018	July 1, 2016
Number of members		
Active employees	41	47
Terminated vested members	0	0
Retired, disabled and beneficiaries	121	122
Total	162	169
Covered employee payroll	3,414,245	3,735,996
Average plan salary	83,274	79,489
Actuarial present value of future benefits	93,112,076	90,211,311
Actuarial accrued liability	88,828,673	85,565,375
Plan assets		
Market value of assets	48,357,463	44,669,265
Actuarial value of assets	53,617,631	53,945,391
Unfunded accrued liability	35,211,042	31,619,984
Funded ratio	60.4%	63.0%
Actuarially determined employer contribution (ADEC)		
Fiscal year ending	2020	2018
ADEC	3,514,375	3,201,799
Fiscal year ending	2021	2019
ADEC	3,514,375	3,201,799

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, 2018 valuation produces the contributions for the fiscal years ending 2020 and 2021.

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 7.75% to 7.375%.

Cash Contribution for Fiscal Years Ending 2020 and 2021

The City cost is:	2020 Fiscal Year	2021 Fiscal Year
	$3,514,375	$3,514,375

Liability Experience During Period Under Review

The plan experienced a net actuarial gain on liabilities of $971,692 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:

	2017 Fiscal Year	2018 Fiscal Year
Market Value Basis	9.9%	10.5%
Actuarial Value Basis	4.3%	5.2%

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.

Certification

This report presents the results of the July 1, 2018 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, 2020 and June 30, 2021. This report is intended to satisfy the requirements of Connecticut General Statute 7-450a. 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.

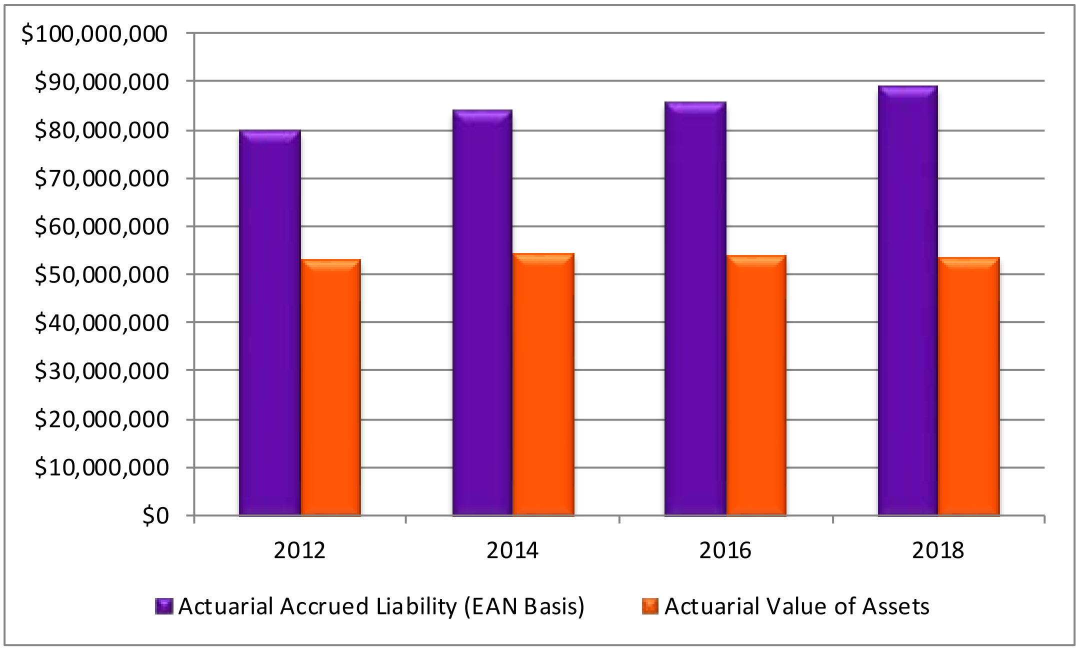
Stephen Chykirda, ASA, ACA, MAAA
Enrolled Actuary 17-07517

July 3, 2019

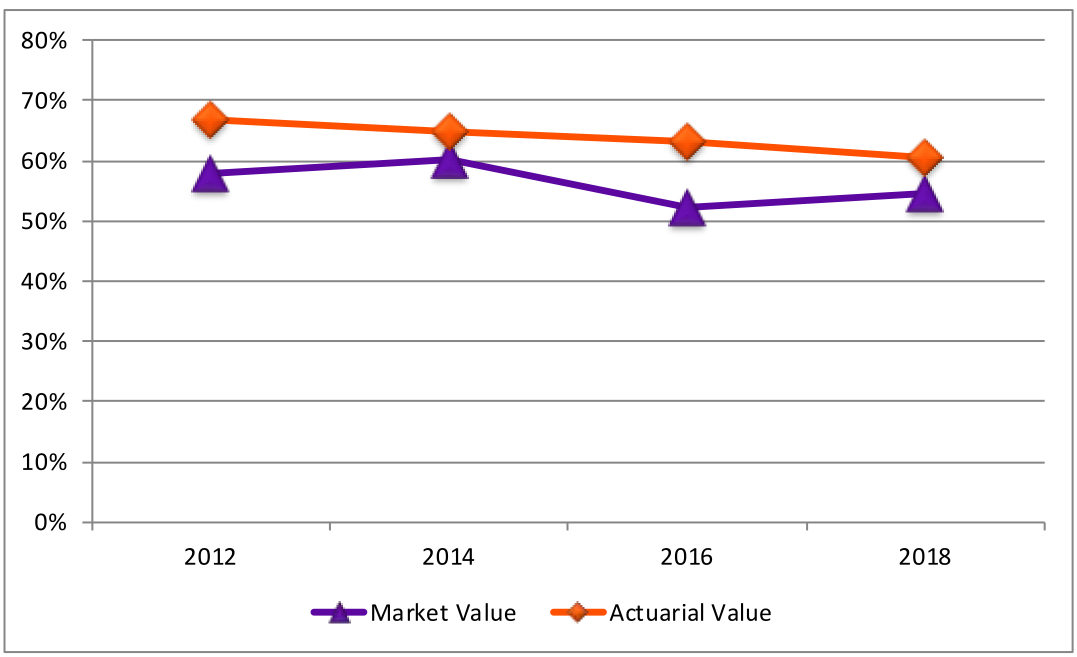
Development of Unfunded Accrued Liability and Funded Ratio

	July 1, 2018	July 1, 2016
Actuarial accrued liability for inactive members		
Retired, disabled and beneficiaries	$68,542,867	$65,074,336
Terminated vested members	0	0
Total	68,542,867	65,074,336
Actuarial accrued liability for active employees	20,285,806	20,491,039
Total actuarial accrued liability	88,828,673	85,565,375
Actuarial value of assets	53,617,631	53,945,391
Unfunded accrued liability	35,211,042	31,619,984
Funded ratio	60.4%	63.0%

Actuarial Accrued Liability vs. Actuarial Value of Assets



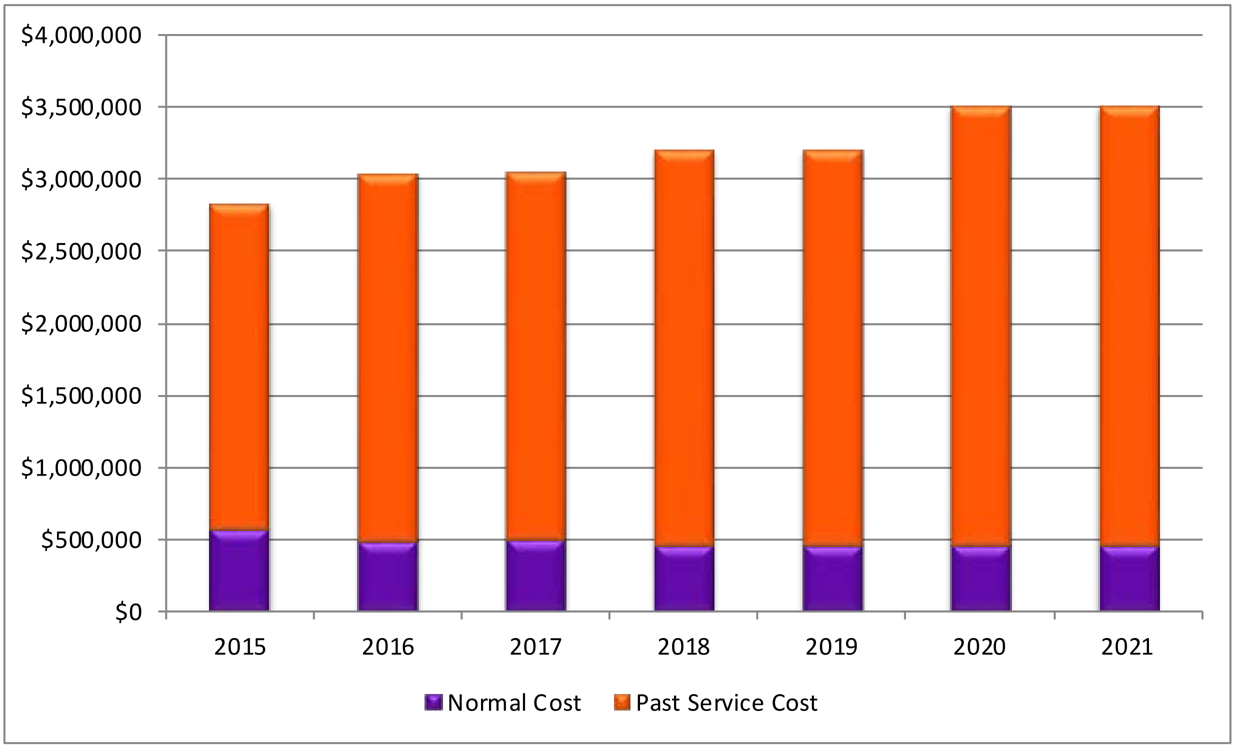
Funded Ratio



Determination of Normal Cost and Actuarially Determined Employer Contribution

	July 1, 2018		July 1, 2016	
	Cost	Percent of payroll	Cost	Percent of payroll
Gross normal cost	$616,549	17.5%	$626,248	16.3%
Estimated employee contributions	(210,917)	-6.0%	(229,880)	-6.0%
Estimated administrative expenses	32,000	0.9%	32,500	0.9%
City's normal cost	437,632	12.4%	428,868	11.2%
Amortization of unfunded accrued liability	2,953,905	84.1%	2,655,637	69.3%
Contribution before adjustment as of the valuation date	3,391,537	96.5%	3,084,505	80.5%
Estimated valuation year payroll for actives not yet at 100% assumed retirement age	3,515,276		3,831,328	
Fiscal year ending	2020		2018	
Adjustment for interest and inflation	122,838		117,294	
Actuarially determined employer contribution	3,514,375		3,201,799	
Fiscal year ending	2021		2019	
Adjustment for interest and inflation	0		0	
Actuarially determined employer contribution	3,514,375		3,201,799	

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, 2018		
Expected unfunded accrued liability July 1, 2017		
Unfunded accrued liability July 1, 2016	$31,619,984	
Gross normal cost July 1, 2016	658,748	
City and employee contributions for 2016-2017	(3,288,185)	
Interest at 7.75% to July 1, 2017	2,378,466	
Expected unfunded accrued liability July 1, 2017	31,369,013	
Expected unfunded accrued liability July 1, 2018		
Expected unfunded accrued liability July 1, 2017	31,369,013	
Expected gross normal cost July 1, 2017	658,748	
City and employee contributions for 2017-2018	(3,433,793)	
Interest at 7.75% to July 1, 2018	2,353,507	
Expected unfunded accrued liability July 1, 2018	30,947,475	
Actuarial (gain) / loss July 1, 2018	2,157,083	
Actual unfunded accrued liability July 1, 2018, prior to plan provision, assumption and method changes		33,104,558
Sources of (gain) / loss		
Assets	3,128,775	
Liabilities	(971,692)	
Total (gain) / loss	2,157,083	
Assumption and method changes since prior valuation		2,106,484
Actual unfunded accrued liability July 1, 2018, after plan provision, assumption and method changes		35,211,042

Development of Asset Values

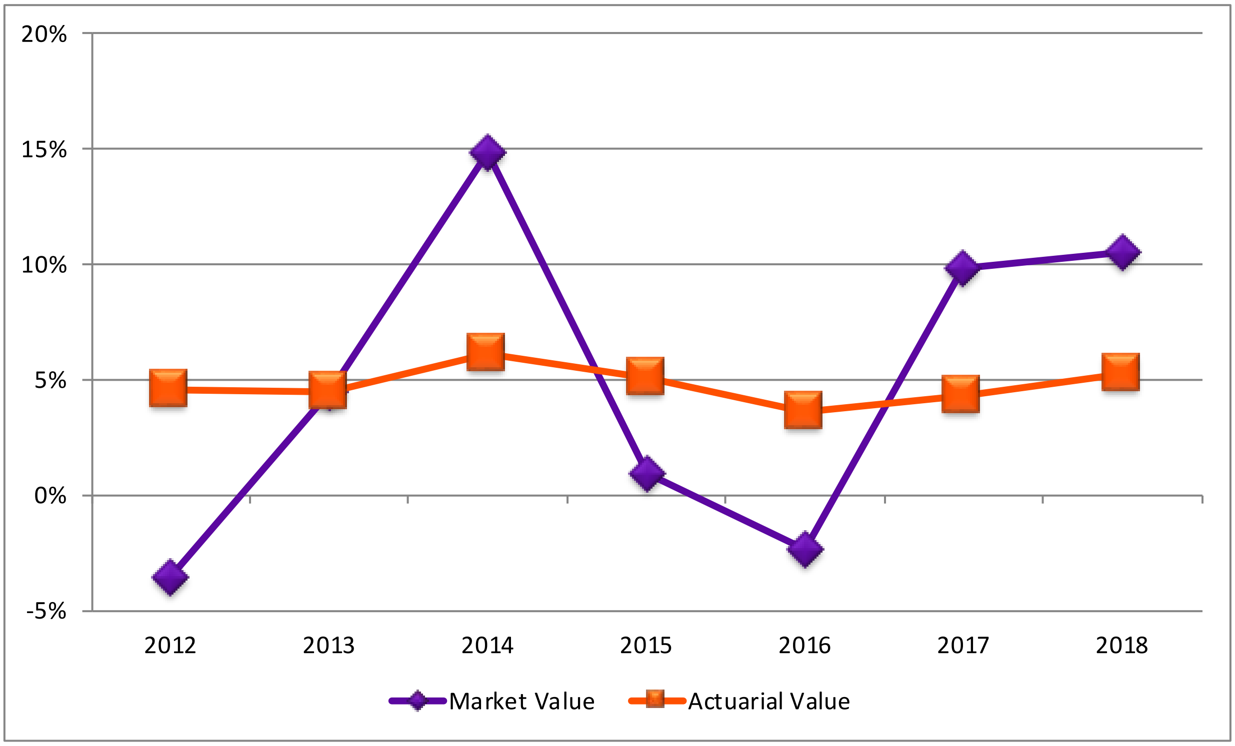
Summary of Fund Activity	July 1, 2016 - June 30, 2017	July 1, 2017 - June 30, 2018
1. Beginning market value of assets		
Trust assets	$44,669,265	$46,205,399
2. Contributions		
City contributions during year	3,054,069	3,201,799
Employee contributions during year	234,116	231,994
Total for plan year	3,288,185	3,433,793
3. Disbursements		
Benefit payments during year	5,954,632	5,954,841
Administrative expenses during year	38,998	25,118
Other disbursements	14,105	12,833
Total for plan year	6,007,735	5,992,792
4. Net investment return		
Interest and dividends	834,480	928,275
Net appreciation (depreciation)	3,652,701	4,029,120
Investment-related expenses	(231,497)	(246,332)
Total for plan year	4,255,684	4,711,063
5. Ending market value of assets		
Trust assets: (1) + (2) - (3) + (4)	46,205,399	48,357,463
6. Approximate rate of return	9.9%	10.5%

Determination of the Actuarial Value of Assets	
1. Actuarial value of assets July 1, 2016	$ 53,945,391
2. City contributions during 2016-2017	3,054,069
3. Employee contributions during 2016-2017	234,116
4. Benefit payments, administrative expenses and other disbursements during 20	(6,007,735)
5. Expected return during 2016-2017	4,054,445
6. Expected actuarial value of assets July 1, 2017	55,280,286
7. Market value of assets July 1, 2017	46,205,399
8. Appreciation (depreciation) recognized: 20% x [(7) - (6)]	(1,814,977)
9. Actuarial value of assets July 1, 2017: (6) + (8)	53,465,309
10. City contributions during 2017-2018	3,201,799
11. Employee contributions during 2017-2018	231,994
12. Benefit payments, administrative expenses and other disbursements during 2	(5,992,792)
13. Expected return during 2017-2018	4,026,363
14. Expected actuarial value of assets July 1, 2018	54,932,673
15. Market value of assets July 1, 2018	48,357,463
16. Appreciation (depreciation) recognized: 20% x [(15) - (14)]	(1,315,042)
17. Preliminary actuarial value of assets July 1, 2018: (14) + (16)	53,617,631
18. Preliminary actuarial value of assets as a percentage of market value of assets	110.9%
19. Actuarial value of assets July 1, 2018	53,617,631
2016-2017 return on actuarial value of assets	4.3%
2017-2018 return on actuarial value of assets	5.2%

Rate of Return on Market Value of Assets				
Period Ending June 30	Average Annual Effective Rate of Return			
	1 Year	3 Years	5 Years	10 Years
2009	-19.6%	-0.4%	N/A	N/A
2010	14.3%	-0.7%	N/A	N/A
2011	20.0%	3.3%	6.3%	N/A
2012	-3.6%	9.8%	2.6%	N/A
2013	4.5%	6.5%	2.1%	N/A
2014	14.8%	5.0%	9.7%	N/A
2015	0.9%	6.6%	7.0%	N/A
2016	-2.4%	4.2%	2.6%	4.4%
2017	9.9%	2.7%	5.4%	3.9%
2018	10.5%	5.8%	6.5%	4.3%

Rate of Return on Actuarial Value of Assets				
Period Ending June 30	Average Annual Effective Rate of Return			
	1 Year	3 Years	5 Years	10 Years
2009	2.2%	5.9%	N/A	N/A
2010	4.0%	4.6%	N/A	N/A
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%

Actual Rate of Return on Assets



Target Allocation and Expected Rate of Return
July 1, 2018

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*	Weighting
Equity - Domestic	45.00%	5.75%	2.59%
Equity - International	12.00%	6.00%	0.72%
Fixed Income	18.00%	2.50%	0.45%
Real Estate	3.00%	4.25%	0.13%
Hedge Funds	4.00%	4.90%	0.20%
Managed Futures	10.00%	4.50%	0.45%
Private Equity	6.00%	10.70%	0.64%
Commodities	0.00%	2.30%	0.00%
Cash	2.00%	0.50%	0.01%
	100.00%		5.19%
Long-Term Inflation Expectation			2.60%
Long-Term Expected Nominal Return			7.79%

**Long-Term Real Returns are provided by Stifel Nicolaus. 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 7.375% was used.

Amortization of Unfunded Liability

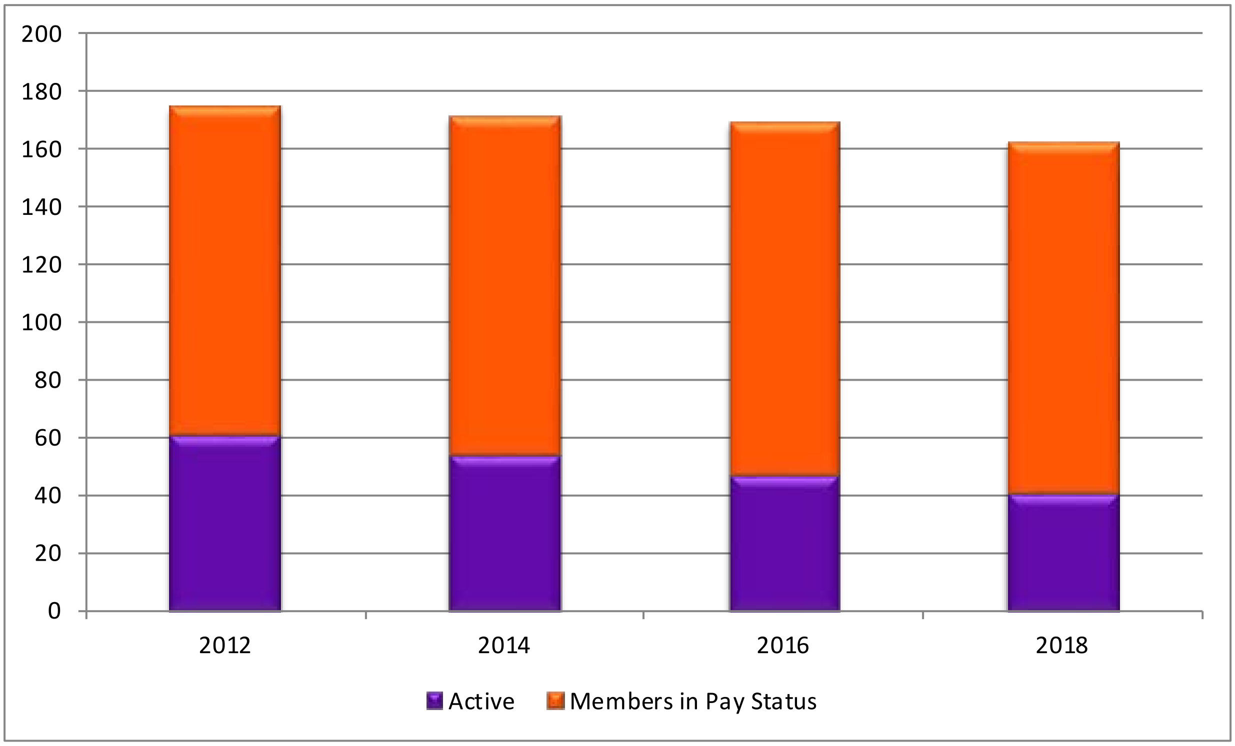
Schedule of Amortization Bases				
	Date established	Amortization installment	Years remaining	Present value of remaining installments as of July 1, 2018
2018 base	July 1, 2018	2,953,905	24	35,211,042

Member Data

The data reported by the Plan Sponsor for this valuation includes 41 active employees who met the Plan's minimum age and service requirements as of July 1, 2018.

Member Data				
	Active	**Terminated vested**	**Members in pay status**	**Total**
Total members July 1, 2016	47	0	122	169
Adjustments	0	0	0	0
Retirements	-5	0	+5	0
Disabilities	-1	N/A	+1	0
Terminations				
Vested	0	0	N/A	0
Lump sum payments	0	0	N/A	0
Due contributions only	0	N/A	N/A	0
Deaths				
With death benefit	0	0	-4	-4
Without death benefit	0	0	-7	-7
Transfers	0	0	N/A	0
Rehires	0	0	N/A	0
New beneficiaries	N/A	N/A	+4	+4
New entrants	0	N/A	N/A	0
Total members July 1, 2018	41	0	121	162

Member Counts by Status



Member Data			
	Active	**Terminated vested**	**Members in pay status**
Average age			
July 1, 2016	50.4	N/A	71.7
July 1, 2018	51.3	N/A	71.7
Average service			
July 1, 2016	24.2	N/A	N/A
July 1, 2018	25.0	N/A	N/A
Covered employee payroll			
July 1, 2016	$3,735,996	N/A	N/A
July 1, 2018	3,414,245	N/A	N/A
Total annual benefits			
July 1, 2016	N/A	N/A	$5,742,127
July 1, 2018	N/A	N/A	5,986,440

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)

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 24 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.

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)

7.375% (Prior: 7.75%)

Salary Scale

Merit table shown below, plus an annual inflation assumption of 2.60% 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:

Fire	
Completed Years of Service	Rate
0	8.00%
1	6.00
2	4.00
3-6	1.50
7-12	1.25
13-14	1.00
15+	0.50

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

2.60%. (Prior: 2.75%)

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 2018 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-2018.

(Prior: RP-2014 Adjusted to 2006 Blue Collar Mortality Table, projected to the valuation date with Scale MP-2016.)

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

(Prior: RP-2014 Adjusted to 2006 Disabled Mortality Table, projected to the valuation date with Scale MP-2016.)

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

(Prior: RP-2014 Adjusted to 2006 Total Dataset Mortality Table, projected to the valuation date with Scale MP-2016.)

Mortality Improvement

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

(Prior All: Projected to date of decrement using Scale MP-2016 (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 2.4%.

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.