THE FIREFIGHTERS' PENSION TRUST FUND OF THE CITY OF STAMFORD

ACTUARIAL VALUATION REPORT

JULY 1, 2016

hooker & holcombe

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Executive Summary

	July 1, 2016	July 1, 2015
Number of members		
Active employees	274	257 *
Terminated vested members	2	0 *
Retired, disabled and beneficiaries	227	223 *
Total	503	480
Covered employee payroll	22,756,531	20,118,733 *
Average plan salary	83,053	78,283
Actuarial present value of future benefits	226,619,694	207,306,117
Actuarial accrued liability	180,482,066	165,668,058
Plan assets		
Market value of assets	116,799,798	124,938,467
Actuarial value of assets	142,545,253	142,539,557
Unfunded accrued liability	37,936,813	23,128,501
Funded ratio	79.0%	86.0%
Actuarially determined employer contribution (ADEC)		
Fiscal year ending	2018	2017
ADEC	6,980,000	5,140,000

** Not updated for Actuarial Valuation in interim year*

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, 2016 valuation produces the contributions for the fiscal year ending 2018.

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 following assumption changes are reflected in this valuation:

- Salary Increase Assumption dropped by .25%
- Inflation decreased .25% to 2.75%
- Payroll growth decreased .25% to 2.75%
- Mortality improvement updated to Scale BB
- Medicare Part B future increases reduced by .25%

Cash Contribution for Fiscal Year Ending 2018

The City cost is:	2018 Fiscal Year
	$6,980,000

Liability Experience During Period Under Review

Liabilities were approximately 3.4% higher than expected over the two year period. The primary reasons for the added liability were a change in the disability funding, higher than expected salary increases, and retiree mortality.

Asset Experience During Period Under Review

	2016 Fiscal Year
Market Value Basis	-3.4%
Actuarial Value Basis	2.7%

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, 2016 Actuarial Valuation for The Firefighters' Pension Trust Fund of the City of Stamford (the Plan) for the purpose of estimating the funded status of the Plan and determining the Actuarially Determined Employer Contribution (ADEC) for the fiscal year ending June 30, 2018. 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.

Evan W. Woollacott

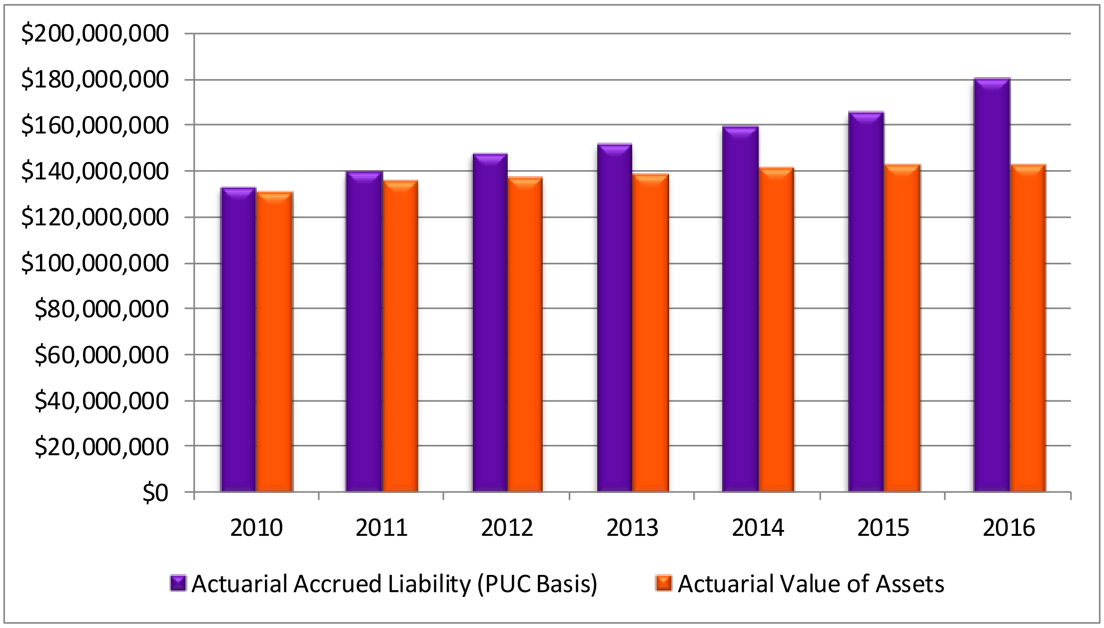
Evan W. Woollacott, Jr., FCA, MAAA
Enrolled Actuary 14-04513

February 17, 2017

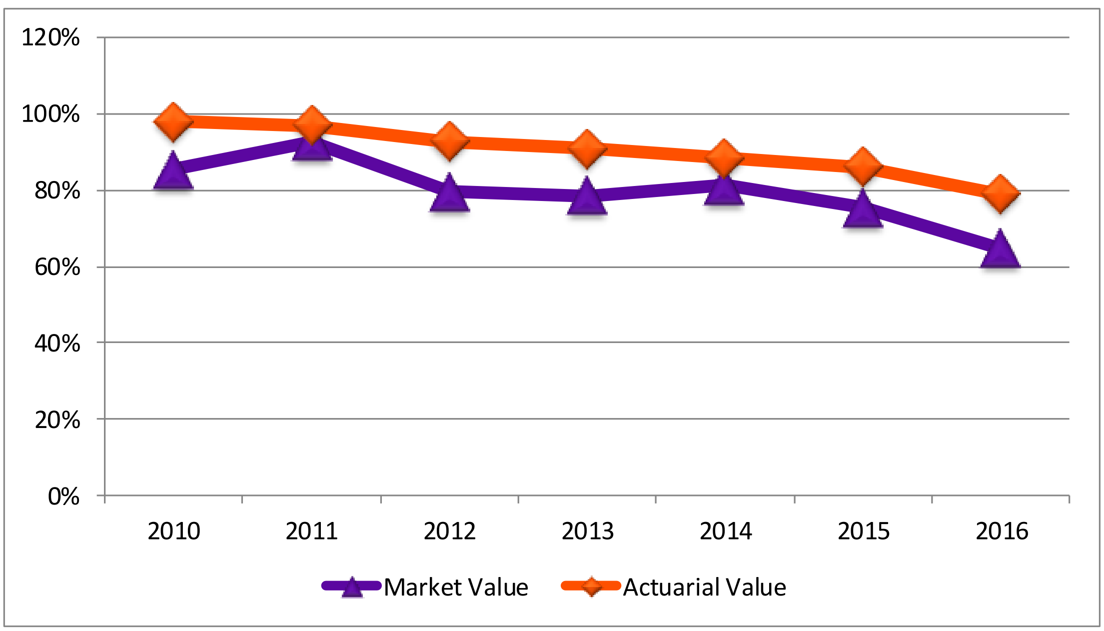
Development of Unfunded Accrued Liability and Funded Ratio

	July 1, 2016	July 1, 2015
Actuarial accrued liability for inactive members		
Retired, disabled and beneficiaries	$95,032,487	$86,277,578
Terminated vested members	1,032,742	0
Total	96,065,229	86,277,578
Actuarial accrued liability for active employees	84,416,837	79,390,480
Total actuarial accrued liability	180,482,066	165,668,058
Actuarial value of assets	142,545,253	142,539,557
Unfunded accrued liability	37,936,813	23,128,501
Funded ratio	79.0%	86.0%

Actuarial Accrued Liability vs. Actuarial Value of Assets



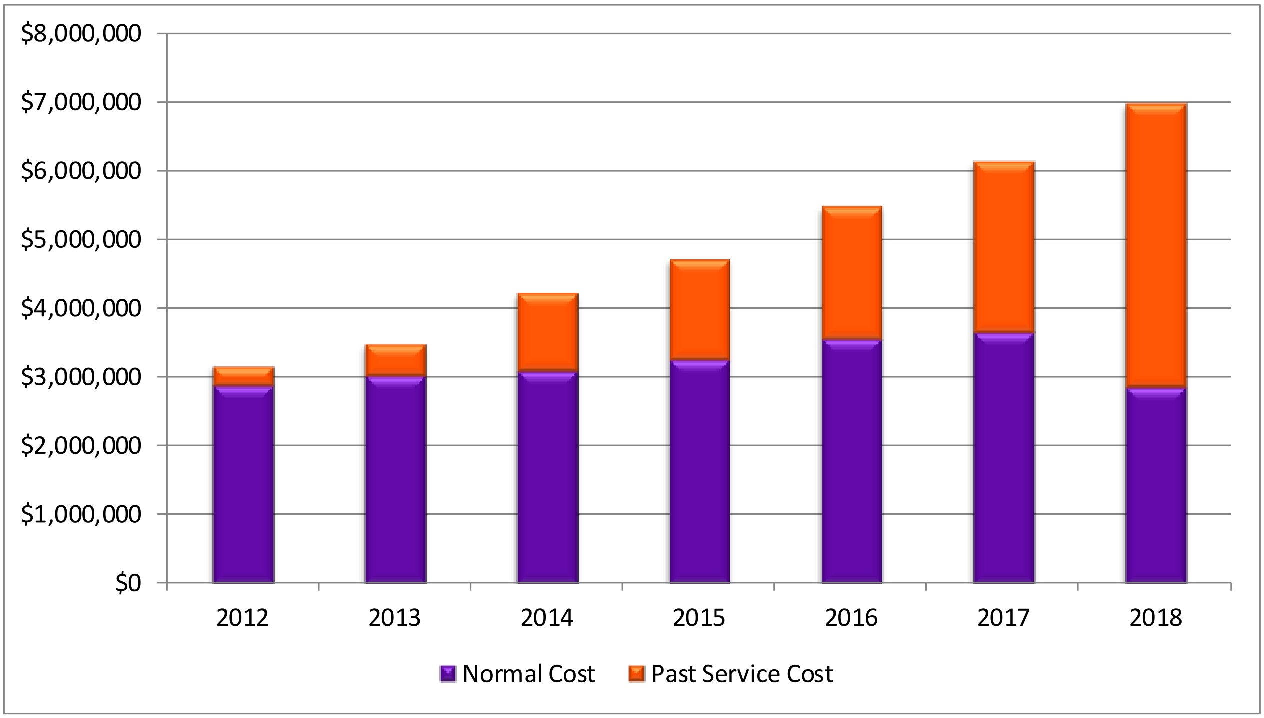
Funded Ratio



Determination of Normal Cost and Actuarially Determined Employer Contribution

	July 1, 2016		July 1, 2015	
	Cost	**Percent of payroll**	**Cost**	**Percent of payroll**
Gross normal cost	$3,938,391	16.9%	$3,547,000	16.6%
Estimated employee contributions	(1,240,212)	-5.3%	(1,137,000)	-5.3%
Estimated administrative expenses	85,000	0.3%	177,000	0.8%
City's normal cost	2,783,179	11.9%	2,587,000	12.1%
Amortization of unfunded accrued liability	4,122,924	17.7%	2,480,637	11.7%
Contribution before adjustment as of the valuation date	6,906,103	29.6%	5,067,637	23.8%
Contribution rounded to nearest $1,000	6,906,000		5,068,000	
Estimated valuation year payroll	23,337,969		21,304,310	
Fiscal year ending	2018		2017	
Adjustment for interest and inflation	74,000		72,000	
Actuarially determined employer contribution	6,980,000		5,140,000	

Actuarially Determined Employer Contribution



Development of Asset Values

Summary of Fund Activity	
1. Beginning market value of assets July 1, 2015	
Trust assets	$124,938,467
2. Contributions	
City contributions during year	4,342,000
Employee contributions during year	1,240,582
Total for plan year	5,582,582
3. Disbursements	
Benefit payments during year	9,436,881
Administrative expenses during year	58,551
Total for plan year	9,495,432
4. Net investment return	
Interest and dividends	1,452,102
Net appreciation (depreciation)	(4,940,953)
Investment-related expenses	(736,968)
Total for plan year	(4,225,819)
5. Ending market value of assets July 1, 2016	
Trust assets: (1) + (2) - (3) + (4)	116,799,798
6. Approximate rate of return	-3.4%

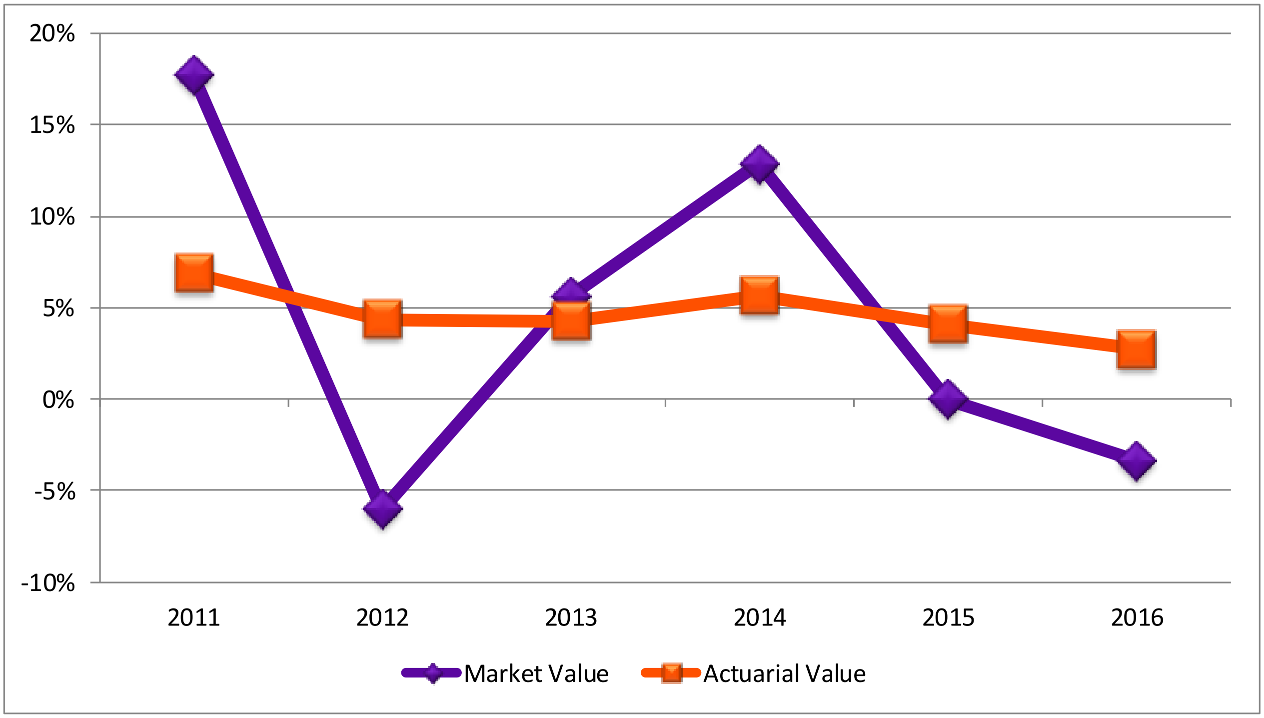
Determination of the Actuarial Value of Assets

1. Actuarial value of assets July 1, 2015	$	142,539,557
2. City contributions during 2015-2016		4,342,000
3. Employee contributions during 2015-2016		1,240,582
4. Benefit payments and administrative expenses during 2015-2016		(9,495,432)
5. Expected return during 2015-2016		10,354,910
6. Expected actuarial value of assets July 1, 2016		148,981,617
7. Market value of assets July 1, 2016		116,799,798
8. Appreciation (depreciation) recognized: 20% x [(7) - (6)]		(6,436,364)
9. Preliminary actuarial value of assets July 1, 2016: (6) + (8)		142,545,253
10. Preliminary actuarial value of assets as a percentage of market value of assets		122.0%
11. Actuarial value of assets July 1, 2016		142,545,253
2015-2016 return on actuarial value of assets		2.7%

Rate of Return on Market Value of Assets				
Period Ending	Average Annual Effective Rate of Return			
June 30	1 Year	3 Years	5 Years	10 Years
2007	N/A	N/A	N/A	N/A
2008	N/A	N/A	N/A	N/A
2009	N/A	N/A	N/A	N/A
2010	N/A	N/A	N/A	N/A
2011	17.7%	N/A	N/A	N/A
2012	-6.1%	N/A	N/A	N/A
2013	5.6%	5.3%	N/A	N/A
2014	12.9%	3.8%	N/A	N/A
2015	0.0%	6.0%	5.7%	N/A
2016	-3.4%	2.9%	1.6%	N/A

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
2007	N/A	N/A	N/A	N/A
2008	N/A	N/A	N/A	N/A
2009	N/A	N/A	N/A	N/A
2010	N/A	N/A	N/A	N/A
2011	6.9%	N/A	N/A	N/A
2012	4.4%	N/A	N/A	N/A
2013	4.3%	5.2%	N/A	N/A
2014	5.6%	4.8%	N/A	N/A
2015	4.1%	4.7%	5.1%	N/A
2016	2.7%	4.2%	4.2%	N/A

Actual Rate of Return on Assets



Target Allocation and Expected Rate of Return
July 1, 2016

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*	Weighting
Large Cap Equities	35.00%	4.65%	1.63%
International Equities	20.00%	5.50%	1.10%
Small Cap Equities	15.00%	5.50%	0.83%
High Quality Bonds	14.00%	1.95%	0.27%
International Income	2.00%	2.00%	0.04%
High Yield	2.00%	3.25%	0.07%
Emerging Markets	2.00%	3.75%	0.08%
Alternative Investments	10.00%	5.00%	0.50%
	100.00%		4.52%
Long-Term Inflation Expectation			2.75%
Long-Term Expected Nominal Return			7.27%

**Long-Term Returns are provided by HHIA. 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. The results support a rate between 7.00% and 7.50%. An expected rate of return of 7.25% was used.

Amortization of Unfunded Liability

Schedule of Amortization Bases

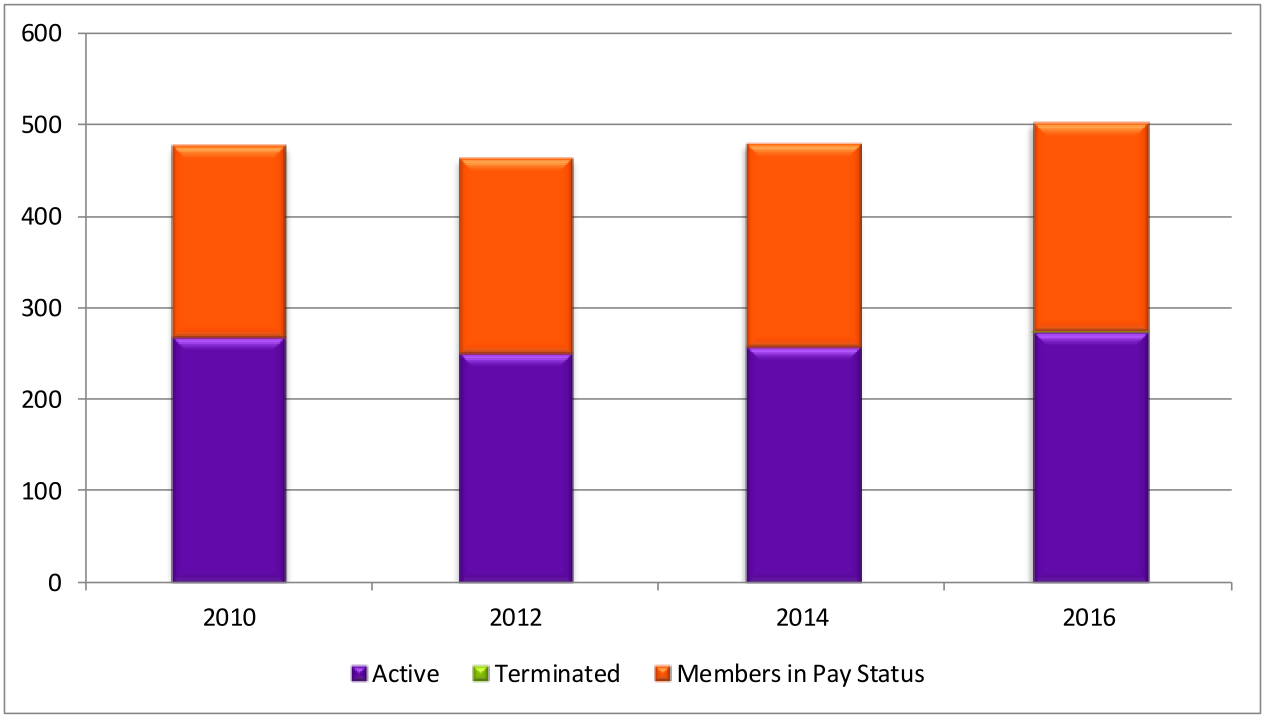
	Date established	Original amount	Amortization installment	Years remaining	Present value of remaining installments as of July 1, 2016
Initial base	July 1, 2014	$18,571,239	$1,931,316	13	$17,068,839
2015 base	July 1, 2015	5,282,184	549,321	14	5,075,996
2016 base	July 1, 2016	15,791,978	1,642,287	15	15,791,978
Total			4,122,924		37,936,813

Member Data

The data reported by the Plan Sponsor for this valuation includes 274 active employees who met the Plan's minimum age and service requirements as of July 1, 2016.

Member Data				
	Active	**Terminated vested**	**Members in pay status**	**Total**
Total members July 1, 2014	257	0	223	480
Adjustments	+1	0	0	+1
Retirements	-6	0	+6	0
Disabilities	-4	N/A	+4	0
Terminations				
Vested	-2	+2	N/A	0
Lump sum payments	-1	0	N/A	-1
Due contributions only	0	N/A	N/A	0
Deaths				
With death benefit	-1	0	-6	-7
Without death benefit	0	0	-8	-8
Transfers	0	0	N/A	0
Rehires	0	0	N/A	0
New beneficiaries	N/A	N/A	+8	+8
New entrants	+30	N/A	N/A	+30
Total members July 1, 2016	274	2	227	503

Member Counts by Status



Member Data				
	Active	**Terminated vested**	**Members in pay status**	**Total**
Average age				
July 1, 2014	46.1	N/A	73.2	
July 1, 2016	45.9	41.0	73.5	
Average service				
July 1, 2014	17.3	N/A	N/A	
July 1, 2016	16.9	N/A	N/A	
Covered employee payroll				
July 1, 2014	$20,118,733	N/A	N/A	$20,118,733
July 1, 2016	22,756,531	N/A	N/A	22,756,531
Total annual benefits				
July 1, 2014	N/A	0.0	$8,374,757	$8,374,757
July 1, 2016	N/A	95,796	9,477,840	9,573,636

Description of Actuarial Methods

Asset Valuation Method

The Actuarial Value of assets used in the development of plan contributions phases in differences between the Market Value and Expected Actuarial Value by recognizing 20% of the difference each year. The Actuarial Value is adjusted, if necessary, to be within the range of 70% and 130% of the Market Value of assets.

Actuarial Cost Method

A. Changes in Actuarial Cost Method: None.

B. Description of Current Actuarial Cost Method: Projected Unit Credit

Normal Cost: Under this method, the normal cost equals the total present value of the benefits accruing for all members during the upcoming year, increased to reflect salaries projected to the assumed retirement date.

Unfunded Accrued Liability: The actuarial accrued liability equals the present value of all benefits accrued to date, increased to reflect salaries for all active members. The actuarial accrued liability is reduced by plan assets to develop the unfunded accrued liability.

We have established the July 1, 2014 unfunded accrued liability as a separate base, and will amortize it to completion over 15 years. Future changes in the unfunded accrued liability will be amortized separately, assuming a fresh 15-year amortization each valuation.

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 actuarial accrued liability and are amortized at the same rate the plan is amortizing the remaining unfunded accrued liability.

Full actuarial valuations are performed every other year. For interim year valuations, the actuarial accrued liability and the normal cost are estimated based on the results of the prior full valuation.

Description of Actuarial Assumptions

Changes in Actuarial Assumptions as of July 1, 2016

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
- Inflation
- Payroll Growth
- Medicare Part B Reimbursement
- Salary Scale

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

Investment Rate of Return

7.25%.

Inflation

2.75%.

Prior: 3.00%.

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.

Mortality

RP-2000 Mortality Table with separate male and female rates, with blue collar adjustment, combined table for non-annuitants and annuitants, projected to the valuation date with Scale BB.

Prior: RP-2000 Mortality Table with separate male and female rates, with blue collar adjustment, combined table for non-annuitants and annuitants, projected to the valuation date with Scale AA.

Mortality Improvement

Projected to date of decrement using Scale BB (generational mortality).

Prior: Projected to date of decrement using Scale AA (generational mortality).

We have selected a mortality table commonly used by public pension systems (such as the State of Connecticut).

We are using Scale BB because it is the most up to date mortality improvement scale which was developed for use with RP-2000.

Salary Scale

Service	Rate
0	14.75%
1-2	9.75%
3	8.75%
4	7.75%
5	6.75%
6	5.75%
7	5.75%
8	4.75%
9	3.75%
10+	3.25%

Prior:

Service	Rate
0	15.0%
1-2	10.0%
3	9.0%
4	8.0%
5	7.0%
6	6.0%
7	6.0%
8	5.0%
9	4.0%
10+	3.5%

The salary increase assumption was based on the experience study as of July 1, 2013.

Payroll Growth Assumption

2.75% annually to project normal cost only.

Prior: 3.00%.

Medicare Part B Reimbursements

2.75% increase assumption each year.

Prior: 3.00%.

Retirement Age

Ret Rates by Years of Service*	
Years	Rate
25	0.040
26	0.000
27	0.040
28	0.040
29	0.040
30	0.040
31	0.040
32	0.180
33	0.110
34	0.380
35	0.100
36	0.220
37	0.000
38	0.290
39	0.200
40	1.000

** Retirement rate at age 65 is 1.00*

The actuarial assumptions in regards to rates of decrement shown above are based on the results of an actuarial experience study.

Turnover

The following annual rates of turnover are assumed:

Age	Probability
20	5.44%
25	4.89%
30	3.70%
35	2.35%
40	0.00%
45	0.00%
50	0.00%
55	0.00%
60	0.00%

The actuarial assumptions in regards to rates of termination shown above are based on the results of an actuarial experience study.

Disability

The following annual rates of disability are assumed:

Age	Probability
20	0.05%
25	0.05%
30	0.05%
35	0.06%
40	0.09%
45	0.18%
50	0.40%
55	0.85%
60	1.74%

The actuarial assumptions in regards to rates of termination shown above are based on the results of an actuarial experience study.

Survivorship

80% of employees assumed to be married, with wives 4 years younger than husbands.

Expenses

The administrative expense is assumed to be the average of the prior two years of administrative expenses.

Vacation Bank

60% of retirees are assumed to elect additional pension credit as an annuity from the fund.

This assumption was based upon the July 1, 2013 experience study.

Payroll growth

2.75% per year. (Previously 3.00% was used)

Percent of active employees married

80%.

Spouse's age

Husbands are assumed to be 4 years older than wives.

The change in assumptions reflected in this valuation increased liabilities by 1.4%.

Summary of Plan Provisions

Plan identification

Single-employer pension plan

Pension Earnings

Base Salary in Final Year or Employment excluding bonuses and overtime including differential amounts.

Normal Retirement

Eligibility: 20 years of service if hired before January 1, 1981; 20 years of service and age 48 if hired after January 1, 1981.

Benefit:

Years of Service	% of Pension Earnings
20	50.00%
21	52.00%
22	54.00%
23	56.00%
24	58.00%
25	60.00%
26	62.00%
27	64.00%
28	66.00%
29	68.00%
30	70.00%
31	72.00%
32	74.00%

Limits on Annual Benefit

Maximum: 74.00% of pension earnings.

Minimum: None.

Early Retirement

Eligibility: None.

Benefit: See Termination Benefit.

Disability - Non-Service Connected

Service Requirement: 20 years of service.

Benefit: 50% of salary, not less than accrued benefit.

Disability - Service Connected

Service Requirement: None.

Benefit: 100% of pay (or 75% of pay depending on extent of disability).

Pre-Retirement Death Benefit - Non Service Connected and less than 10 years of service

Service Requirement: None.

Benefit: Return of employee contributions with interest.

Pre-Retirement Death Benefit - Service Connected or more than 10 years of service

Service Requirement: None, if service connected; 10 years if non service connected.

Benefit: Greater of 100% of retirement benefit and 50% of salary.

Post-Retirement Spouse's Benefit

100% of pension retiree was receiving.

Post-Retirement Death Benefit

Lump sum, excess of accumulated contributions over benefits paid to member or survivors (if not eligible for spouse's benefit).

Medicare Part B

The City pays the cost of the Medicare Part B supplemental benefit from the pension trust for each retiree receiving Medicare coverage. The 2014 Medicare Part B monthly premium is $104.90.

Vesting in Accrued Benefit

Eligibility: 15 years of service.

Benefit: 2.5% of final salary times service. Benefit is payable when the employee would have had 20 years of service but not earlier than age 48.

Termination Benefit

Accumulated contributions as lump sum, if not vested.

Employee Contributions

6.25% of salary; no contributions for those with 32 or more years of service.

Additional Retirement Benefits

Employees can trade in vacation leave for additional pension credit. Each 20 days grants an additional 1.5% of salary up to a maximum of 7.5%.