

THE POLICE PENSION TRUST FUND OF THE CITY OF STAMFORD

ACTUARIAL VALUATION REPORT

JULY 1, 2017



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Executive Summary

	July 1, 2017	July 1, 2016
Number of members		
Active employees	274	272
Terminated vested members	0	1
Employees in DROP	0	0
Retired, disabled and beneficiaries	329	323
Total	603	596
Covered employee payroll	22,344,105	21,692,397
Average plan salary	81,548	79,751
Actuarial present value of future benefits	300,452,983	290,200,461
Actuarial accrued liability	263,886,403	254,339,167
Plan assets		
Market value of assets	202,493,336	186,944,990
Actuarial value of assets	213,613,510	206,260,036
Unfunded accrued liability	50,272,893	48,079,131
Funded ratio	80.9%	81.1%
Actuarially determined employer contribution (ADEC)		
Fiscal year ending	2019	2018
ADEC	8,711,000	8,275,000



Asset Experience During Period Under Review

	2017 Fiscal Year
Market Value Basis	10.8%
Actuarial Value Basis	5.9%

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, 2017 Actuarial Valuation for The Police 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, 2019. 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, Jr., FCA, MAAA, EA
Enrolled Actuary 17-04513

January 30, 2018

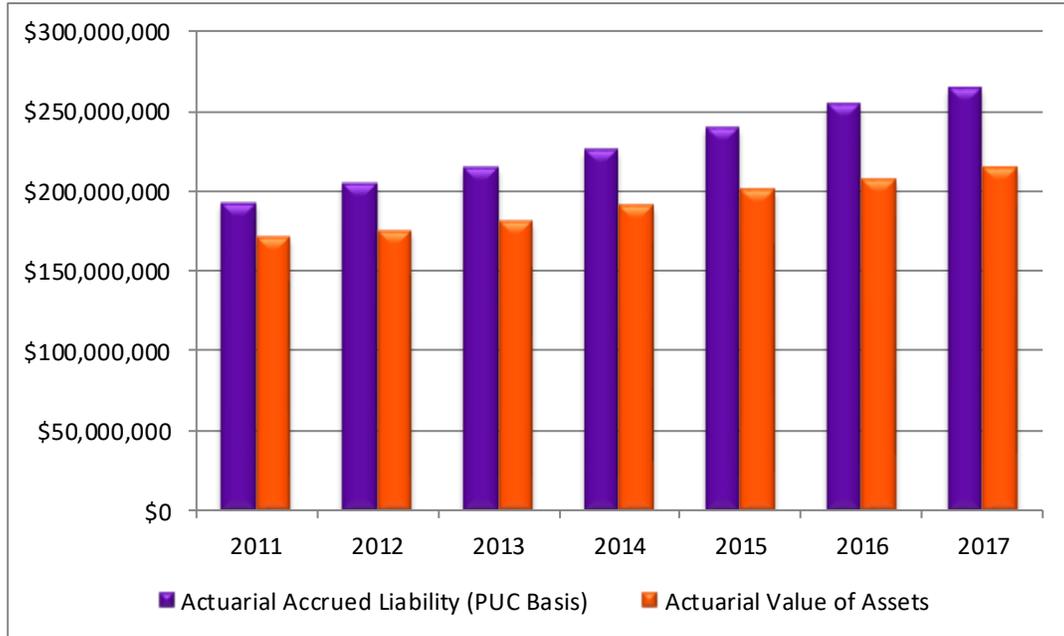


Development of Unfunded Accrued Liability and Funded Ratio

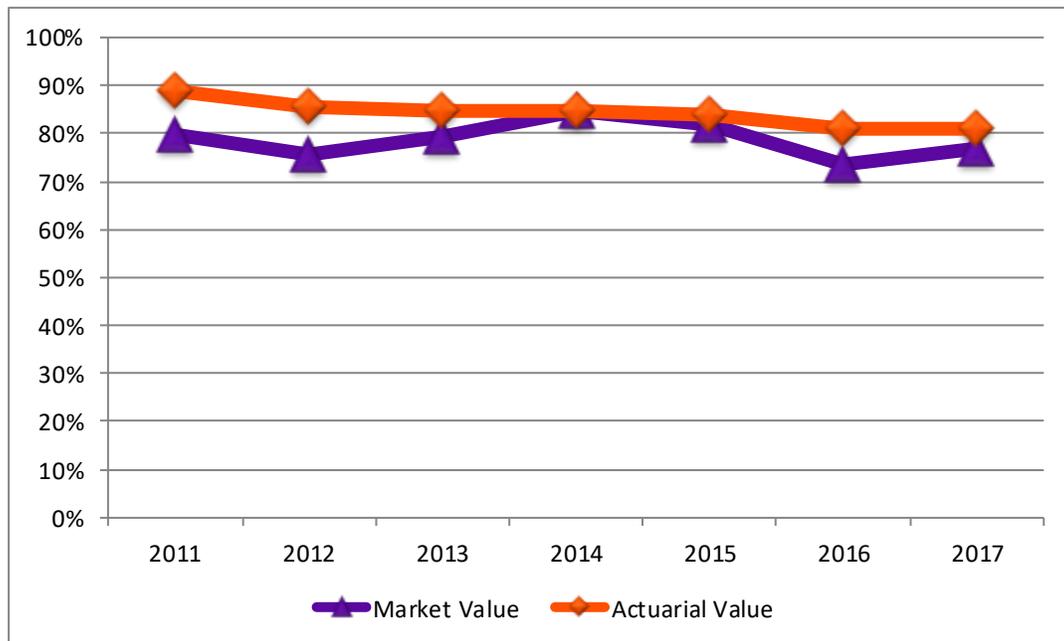
	July 1, 2017	July 1, 2016
Actuarial accrued liability for inactive members		
Retired, disabled and beneficiaries	\$151,660,859	\$145,298,458
Terminated vested members	0	421,392
Total	151,660,859	145,719,850
Actuarial accrued liability for employees in DROP	0	0
Actuarial accrued liability for active employees	112,225,544	108,619,317
Total actuarial accrued liability	263,886,403	254,339,167
Actuarial value of assets	213,613,510	206,260,036
Unfunded accrued liability	50,272,893	48,079,131
Funded ratio	80.9%	81.1%



Actuarial Accrued Liability vs. Actuarial Value of Assets



Funded Ratio



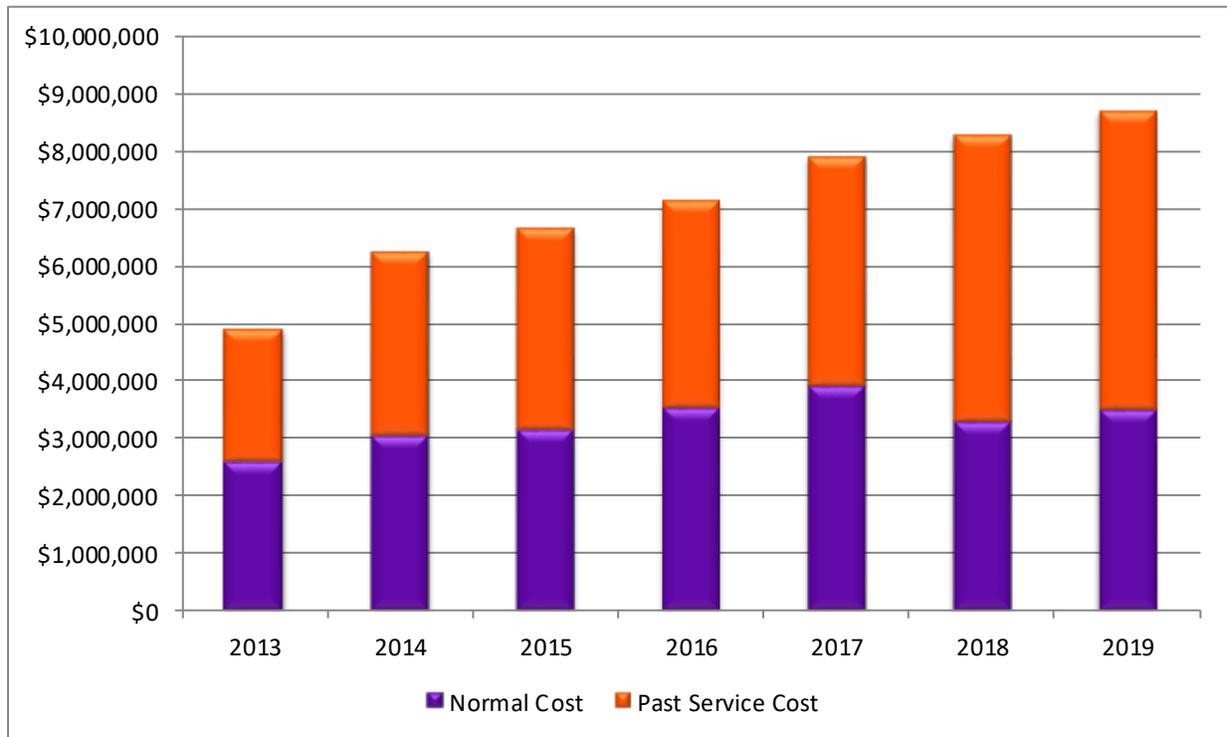


Determination of Normal Cost and Actuarially Determined Employer Contribution

	July 1, 2017		July 1, 2016	
	Cost	Percent of payroll	Cost	Percent of payroll
Gross normal cost	\$4,407,403	19.7%	\$4,170,614	19.2%
Estimated employee contributions	(1,284,847)	-5.7%	(1,239,509)	-5.7%
Estimated administrative expenses	288,000	1.2%	277,000	1.3%
City's normal cost	3,410,556	15.2%	3,208,105	14.8%
Amortization of unfunded accrued liability	5,214,201	23.3%	4,986,669	22.9%
Contribution before adjustment as of the valuation date	8,624,757	38.5%	8,194,774	37.7%
Contribution rounded to nearest \$1,000	8,625,000		8,195,000	
Estimated valuation year payroll for actives not yet at 100% assumed retirement age	22,380,232		21,723,515	
Fiscal year ending	2019		2018	
Adjustment for interest and inflation	86,000		80,000	
Actuarially determined employer contribution	8,711,000		8,275,000	



Actuarially Determined Employer Contribution





Development of Asset Values

Summary of Fund Activity	
1. Beginning market value of assets July 1, 2016	
Trust assets	\$186,944,990
2. Contributions	
City contributions during year	7,903,000
Employee contributions during year	1,302,140
Total for plan year	9,205,140
3. Disbursements	
Benefit payments during year	13,782,624
Administrative expenses during year	249,825
Total for plan year	14,032,449
4. Net investment return	
Interest and dividends	7,096,876
Net appreciation (depreciation)	14,342,466
Investment-related expenses	(1,063,687)
Total for plan year	20,375,655
5. Ending market value of assets July 1, 2017	
Trust assets: (1) + (2) - (3) + (4)	202,493,336
6. Approximate rate of return	
	10.8%



Determination of the Actuarial Value of Assets	
1. Actuarial value of assets July 1, 2016	\$ 206,260,036
2. City contributions during 2016-2017	7,903,000
3. Employee contributions during 2016-2017	1,302,140
4. Benefit payments and administrative expenses during 2016-2017	(14,032,449)
5. Expected return during 2016-2017	<u>14,960,827</u>
6. Expected actuarial value of assets July 1, 2017	216,393,554
7. Market value of assets July 1, 2017	202,493,336
8. Appreciation (depreciation) recognized: 20% x [(7) - (6)]	(2,780,044)
9. Preliminary actuarial value of assets July 1, 2017: (6) + (8)	213,613,510
10. Preliminary actuarial value of assets as a percentage of market value of assets	105.5%
11. Actuarial value of assets July 1, 2017	213,613,510
2016-2017 return on actuarial value of assets	5.9%

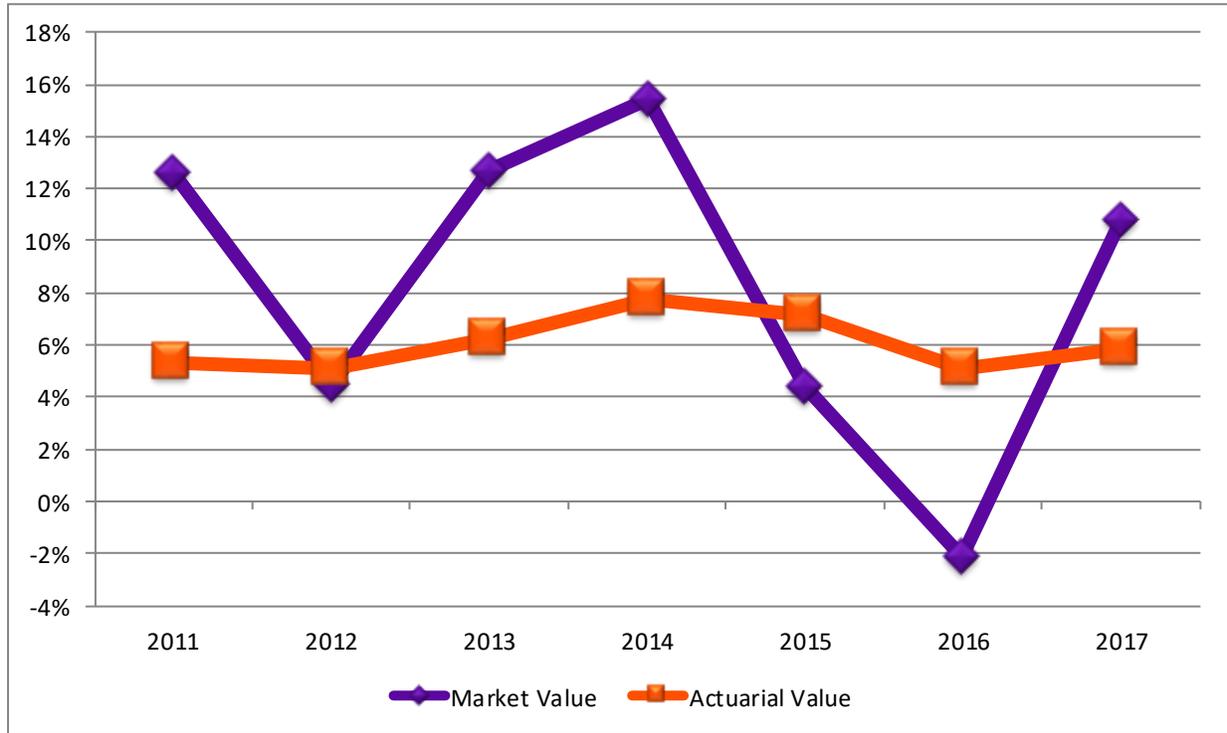


Rate of Return on Market Value of Assets				
Period Ending June 30	Average Annual Effective Rate of Return			
	1 Year	3 Years	5 Years	10 Years
2008	N/A	N/A	N/A	N/A
2009	N/A	N/A	N/A	N/A
2010	14.2%	N/A	N/A	N/A
2011	12.6%	N/A	N/A	N/A
2012	4.5%	10.4%	N/A	N/A
2013	12.7%	9.9%	N/A	N/A
2014	15.4%	10.8%	11.8%	N/A
2015	4.4%	10.7%	9.8%	N/A
2016	-2.1%	5.6%	6.8%	N/A
2017	10.8%	4.2%	8.0%	N/A

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
2008	N/A	N/A	N/A	N/A
2009	N/A	N/A	N/A	N/A
2010	3.9%	N/A	N/A	N/A
2011	5.3%	N/A	N/A	N/A
2012	5.1%	4.8%	N/A	N/A
2013	6.2%	5.5%	N/A	N/A
2014	7.8%	6.4%	5.7%	N/A
2015	7.1%	7.0%	6.3%	N/A
2016	5.1%	6.7%	6.3%	N/A
2017	5.9%	6.0%	6.4%	N/A



Actual Rate of Return on Assets





Target Allocation and Expected Rate of Return July 1, 2017

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*	Weighting
US Equity	25.00%	7.00%	1.75%
Non-US Equity	14.00%	7.25%	1.02%
US Fixed Income	20.00%	2.25%	0.45%
Alternatives	25.00%	4.00%	1.00%
Real Estate/REITs	14.00%	7.00%	0.98%
Cash	2.00%	0.00%	0.00%
	100.00%		5.20%
Long-Term Inflation Expectation			2.25%
Long-Term Expected Nominal Return			7.45%

**Long-Term Returns are provided by Clearbrook. The returns are arithmetic 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 arithmetic means. The investment return assumption was selected using the long term asset allocation shown above. An expected rate of return of 7.20% was used.

We did not receive updated information as of July 1, 2017. The above is taken from the July 1, 2016 report.



Amortization of Unfunded Liability

Schedule of Amortization Bases				
	Date established	Amortization installment	Years remaining	Present value of remaining installments as of July 1, 2017
2017 base	July 1, 2017	5,214,201	15	50,272,893



Member Data

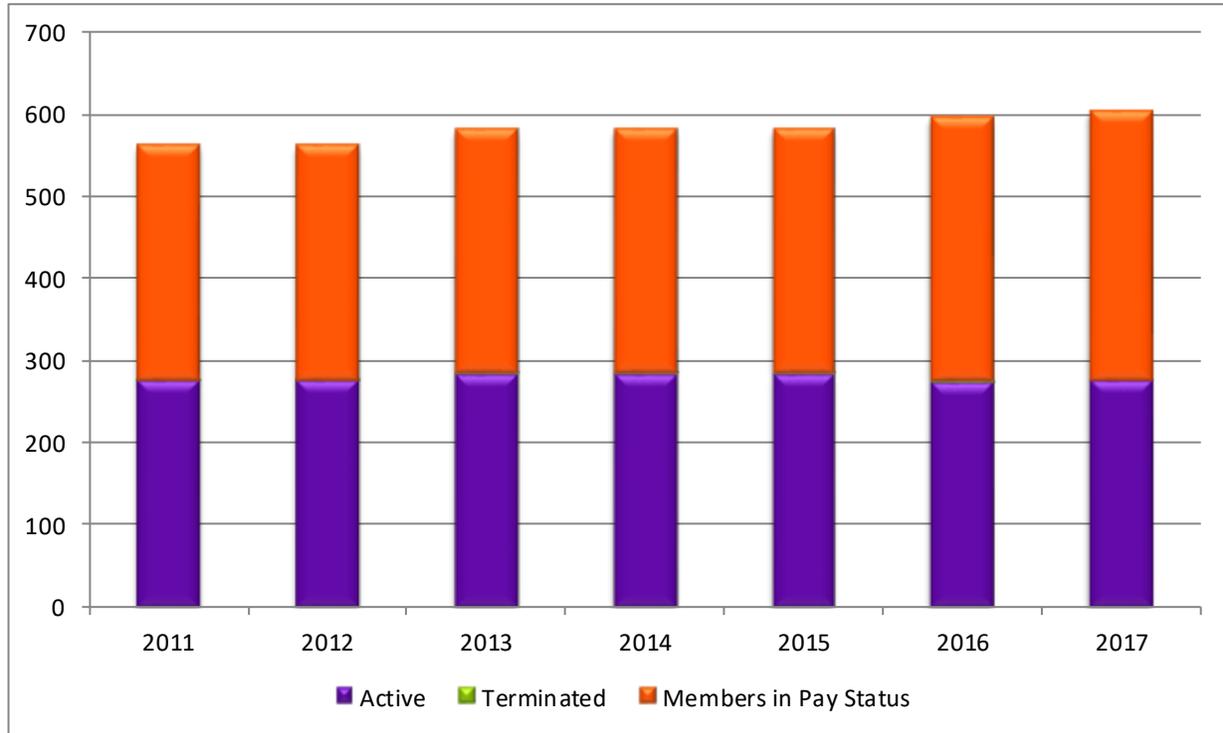
The data reported by the Plan Sponsor for this valuation includes 274 active employees who met the Plan's minimum age and service requirements as of July 1, 2017.

Member Data					
	Active	Terminated vested	Employees in DROP	Members in pay status	Total
Total members July 1, 2016	272	1	0	323	596
Adjustments	0	0	0	+1	+1
Retirements	-2	-1	0	+3	0
Disabilities	-6	N/A	0	+6	0
Entered DROP	0	N/A	0	N/A	0
Terminations					
Vested	0	0	N/A	N/A	0
Lump sum payments	0	0		N/A	0
Due contributions only	0	N/A	N/A	N/A	0
Deaths					
With death benefit	0	0	0	-3	-3
Without death benefit	0	0	0	-7	-7
Transfers	0	0	N/A	N/A	0
Rehires	0	0	N/A	N/A	0
New beneficiaries	N/A	N/A	N/A	+6	+6
New entrants	+10	N/A	N/A	N/A	+10
Total members July 1, 2017	274	0	0	329*	603

* Includes 3 alternate payees receiving benefits



Member Counts by Status





Member Data				
	Active	Terminated vested	Employees in DROP	Members in pay status
Average age				
July 1, 2016	45.0	49.0	N/A	69.1
July 1, 2017	45.0	N/A	N/A	69.1
Average service				
July 1, 2016	17.3	N/A	N/A	N/A
July 1, 2017	17.3	N/A	N/A	N/A
Covered employee payroll				
July 1, 2016	\$21,692,397	N/A	N/A	N/A
July 1, 2017	22,344,105	N/A	N/A	N/A
Total annual benefits				
July 1, 2016	N/A	\$34,054	N/A	\$13,525,216
July 1, 2017	N/A	N/A	N/A	14,169,928



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. 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. This amount is amortized over 15 years on an open 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 actuarial accrued liability and are amortized at the same rate the plan is amortizing the remaining unfunded accrued liability.



Description of Actuarial Assumptions

Changes in Actuarial Assumptions

None.

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

7.20%.

Rate of compensation increase (including inflation)

Service	Rate
0	15.00%
1	15.00%
2-5	6.00%
6+	2.75%

The actuarial assumption in regards to rate of compensation increases shown above is based on the results of an actuarial experience study for the period 2008-2014.

Inflation

2.75%.

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, separate tables for non-annuitants and annuitants, projected to the valuation date with Scale BB.

Mortality Improvement

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

We have selected a mortality table commonly used by public pension systems. It is a recently published pension mortality study released by the Society of Actuaries. The plan does not have sufficiently credible data on which to perform a mortality experience study.

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



Retirement age

Service	Rate
20	13%
21	11%
22	8%
23	7%
24	7%
25	7%
26	7%
27	8%
28	8%
29	8%
30	11%
31	13%
32	14%
33	13%
34	19%
35	20%
36	21%
37	17%
38	16%
39	18%
40	24%
41	24%
42	27%
43	21%
44	25%
45	22%
46	35%
47	50%

Additionally, 100% of participants are assumed to retire upon reaching age 65.

Termination prior to retirement

The following sample annual rates of turnover are assumed:

Age	Rate
20	1.81%
25	1.63%
30	1.23%
35	0.78%
40	0.00%
45	0.00%
50	0.00%
55	0.00%
60	0.00%



Disability

The following sample annual rates of disability are assumed:

Age	Rate
20	0.30%
25	0.30%
30	0.30%
35	0.36%
40	0.54%
45	1.08%
50	2.40%
55	5.10%
60	10.44%

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

Administrative expenses

The estimate is based on the average of the actual expenses paid from the trust in the past 2 years.

Payroll growth

2.75% per year.

Percent of active employees married

80%.

Spouse's age

Husbands are assumed to be 4 years older than wives.

Sick Bank and Vacation Bank

34% of retirees are assumed to elect an annuity from the fund.

Post-Retirement Life Insurance

100% of active and retired employees are assumed to have a \$4,000 life insurance policy beginning at retirement.

Medicare Part B Reimbursement

2.75% increase assumption each year.



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.

Pension Earnings

For those hired before April 11, 2016, Base Salary in Final Year of Employment plus 14 paid holidays.

For those hired after April 11, 2016, average of 3 highest base salaries (including 14 paid holidays).

Normal Retirement

Eligibility: 20 years of service

Benefit (for those hired before April 11, 2016):

Years of Service	% of Pension Earnings
20	50.00%
21	53.00%
22	56.00%
23	59.00%
24	62.00%
25	65.00%
26	67.33%
27	69.66%
28	71.99%
29	74.32%
30	76.65%

For those hired after April 11, 2016, 2.25% per year of service times pension earnings.

Limits on Annual Benefit

Maximum: 76.65% of pension earnings plus a possible 7.5% (from Sick Bank) for a total of 84.15% if hired before April 11, 2016. If hired after April 11, 2016, the maximum benefit is 100% of the average salary.

Minimum: None.

Early Retirement

Eligibility: None.

Minimum: See Termination Benefit.

Disability:

Service Requirement: None.

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



Pre-Retirement Death Benefit – Non Service Connected

Service Requirement: 10 years of service.

Benefit: 50% of salary.

Pre-Retirement Death Benefit – Service Connected

Service Requirement: None.

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

Post-Retirement Spouse's Benefit

For those hired before April 11, 2016, 100% of pension retiree was receiving.

For those hired after April 11, 2016, the retiree can elect an actuarially reduced joint & survivor annuity at retirement.

Post-Retirement Lump Sum at Death

Lump Sum equal to \$4,000.00.

Vesting in Accrued Benefit

Eligibility: 10 years of service.

For those hired before April 11, 2016, 50% of final salary times the ratio of service at termination to 20 years.

For those hired after April 11, 2016, 2.25% times years of service times pension earnings. Benefit is payable when the officer 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

7% of salary; no contributions for those with 30 or more years of service (35 or more years for those hired after April 11, 2016).

Additional Retirement Benefits

Employees can trade in 50% of sick leave for additional pension credit. If an officer's sick bank has less than 200 days, unused vacation time may be added, subject to a maximum of 200 sick and unused vacation days combined. Each 20 days grants an additional 1.5% of salary up to a maximum of 7.5%. Employees hired after April 11, 2016 are not eligible to exchange sick time for additional pension credit.

Medicare Part B Reimbursement

The Medicare Part B premium is reimbursed from the pension fund for participants hired before April 11, 2016.