



TOWN OF COLCHESTER POLICE PENSION PLAN

ACTUARIAL VALUATION REPORT

JULY 1, 2016

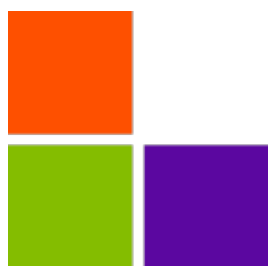




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Executive Summary

	July 1, 2016	July 1, 2014
Number of members		
Active employees	9	10
Terminated vested members	0	0
Retired, disabled and beneficiaries	0	0
Total	9	10
Covered employee payroll	665,300	673,883
Average plan salary	73,922	67,388
Actuarial present value of future benefits	4,161,332	3,690,424
Actuarial accrued liability	2,190,206	1,583,823
Plan assets		
Market value of assets	1,655,492	1,287,557
Actuarial value of assets	1,799,632	1,287,557
Unfunded accrued liability	390,574	296,266
Funded ratio	82.2%	81.3%
Actuarially determined employer contribution (ADEC)		
Fiscal year ending	2018	2016
ADEC	145,300	119,514
Fiscal year ending	2019	2017
ADEC	149,560	123,370



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, 2016 valuation produces the contributions for the fiscal years ending 2018 and 2019.

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

- Asset Valuation Method
- Investment Return
- Mortality
- Rate of Compensation increase (including inflation)

Cash Contribution for Fiscal Years Ending 2018 and 2019

The Town cost is:	2018 Fiscal Year	2019 Fiscal Year
	\$145,300	\$149,560

Liability Experience During Period Under Review

The plan experienced a net actuarial gain on liabilities over the prior period of approximately \$98,200.



Asset Experience During Period Under Review

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

	2015 Fiscal Year	2016 Fiscal Year
Market Value Basis	1.9%	-0.4%
Actuarial Value Basis	6.4%	4.8%

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.



Certification

This report presents the results of the July 1, 2016 Actuarial Valuation for Town of Colchester Police 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, 2018 and 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.



Timothy A. Ryor, FCA, FSA, MAAA
Enrolled Actuary 14-05126

February 10, 2017



Development of Unfunded Accrued Liability and Funded Ratio

	July 1, 2016	July 1, 2014
Actuarial accrued liability for inactive members		
Retired, disabled and beneficiaries	\$0	\$0
Terminated vested members	0	0
Total	0	0
Actuarial accrued liability for active employees	2,190,206	1,583,823
Total actuarial accrued liability	2,190,206	1,583,823
Actuarial value of assets	1,799,632	1,287,557
Unfunded accrued liability	390,574	296,266
Funded ratio	82.2%	81.3%



Determination of Normal Cost and Actuarially Determined Employer Contribution

	July 1, 2016		July 1, 2014	
	Cost	Percent of payroll	Cost	Percent of payroll
Gross normal cost	\$179,785	25.8%	\$167,993	23.6%
Estimated employee contributions	(86,937)	-12.5%	(88,961)	-12.5%
Town's normal cost	92,848	13.3%	79,032	11.1%
Amortization of unfunded accrued liability	43,675	6.3%	31,222	4.4%
Contribution before adjustment as of the valuation date	136,523	19.6%	110,254	15.5%
Contribution rounded to nearest \$10	136,520		110,250	
Estimated valuation year payroll	695,499		711,685	
Fiscal year ending	2018		2016	
Adjustment for interest and inflation	8,780		9,264	
Actuarially determined employer contribution	145,300		119,514	
Fiscal year ending	2019		2017	
Adjustment for interest and inflation	4,260		3,856	
Actuarially determined employer contribution	149,560		123,370	



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, 2016	
Expected unfunded accrued liability July 1, 2015	
Unfunded accrued liability July 1, 2014	\$296,266
Gross normal cost July 1, 2014	167,993
Town and employee contributions for 2014-2015	(182,421)
Interest at 7.50% to July 1, 2015	28,159
Expected unfunded accrued liability July 1, 2015	309,997
Expected unfunded accrued liability July 1, 2016	
Expected unfunded accrued liability July 1, 2015	309,997
Expected gross normal cost July 1, 2015	175,553
Town and employee contributions for 2015-2016	(188,101)
Interest at 7.50% to July 1, 2016	29,529
Expected unfunded accrued liability July 1, 2016	326,978
Actuarial (gain) / loss July 1, 2016	(43,243)
Actual unfunded accrued liability July 1, 2016, prior to plan provision, assumption and method changes	283,735
Sources of (gain) / loss	
Assets	55,000
Liabilities	(98,200)
Total (gain) / loss (rounded to nearest \$100)	(43,200)
Assumption and method changes since prior valuation	106,839
Actual unfunded accrued liability July 1, 2016, after plan provision, assumption and method changes	390,574



Development of Asset Values

Summary of Fund Activity		
	Market Value	Actuarial Value
1. Beginning value of assets July 1, 2014		
Trust assets	\$1,287,557	\$1,287,557
2. Contributions		
Town contributions during year	100,616	100,616
Employee contributions during year	81,805	81,805
Total for plan year	182,421	182,421
3. Disbursements		
Benefit payments during year	23,169	23,169
Administrative expenses during year	0	0
Total for plan year	23,169	23,169
4. Net investment return		
Interest and dividends	26,378	N/A
Realized and unrealized gain / (loss)	0	N/A
Expected return	N/A	102,382
Recognized gain / (loss)	N/A	(15,201)
Required adjustment due to corridor	N/A	0
Reversal of prior year required adjustment	N/A	0
Investment-related expenses	0	N/A
Total for plan year	26,378	87,181
5. Ending value of assets July 1, 2015		
Trust assets: (1) + (2) - (3) + (4)	1,473,187	1,533,990
6. Approximate rate of return	1.9%	6.4%



Relationship of Actuarial Value to Market Value

1. Market value 7/1/2015	\$1,473,187
2. Gain / (loss) not recognized in actuarial value 7/1/2015	(60,803)
3. Preliminary actuarial value 7/1/2015: (1) - (2)	1,533,990
4. Preliminary actuarial value as a percentage of market value: (3) ÷ (1)	104.1%
5. Gain / (loss) recognized for corridor minimum / maximum	N/A
6. Actuarial value 7/1/2015 after corridor minimum / maximum: (3) + (5)	1,533,990
7. Actuarial value as a percentage of market value: (6) ÷ (1)	104.1%

Development of Market Value Gain / (Loss) for 2014-2015 Plan Year

1. Market value 7/1/2014	\$1,287,557
2. Town contributions	100,616
3. Employee contributions	81,805
4. Benefit payments	23,169
5. Administrative expenses	0
6. Expected return at 7.50%	102,382
7. Expected value 7/1/2015: (1) + (2) + (3) - (4) - (5) + (6)	1,549,191
8. Market value 7/1/2015	1,473,187
9. Market value gain / (loss) for 2014-2015 plan year: (8) - (7)	(76,004)

Recognition of Gain / (Loss) in Actuarial Value

Year	(a) Gain / (loss)	(b) Total recognized as of 7/1/2014	(c) Recognized in current year: 20% of (a)	(d) Total recognized as of 7/1/2015: (b) + (c)	(e) Not recognized as of 7/1/2015: (a) - (d)
2010-2011	\$0	\$0	\$0	\$0	\$0
2011-2012	0	0	0	0	0
2012-2013	0	0	0	0	0
2013-2014	0	0	0	0	0
2014-2015	(76,004)	0	(15,201)	(15,201)	(60,803)
Total			(15,201)		(60,803)



Summary of Fund Activity		
	Market Value	Actuarial Value
1. Beginning value of assets July 1, 2015		
Trust assets	\$1,473,187	\$1,533,990
2. Contributions		
Town contributions during year	105,755	105,755
Employee contributions during year	82,346	82,346
Total for plan year	188,101	188,101
3. Disbursements		
Benefit payments during year	0	0
Administrative expenses during year	0	0
Total for plan year	0	0
4. Net investment return		
Interest and dividends	(5,796)	N/A
Realized and unrealized gain / (loss)	0	N/A
Expected return	N/A	117,377
Recognized gain / (loss)	N/A	(39,836)
Required adjustment due to corridor	N/A	0
Reversal of prior year required adjustment	N/A	0
Investment-related expenses	0	N/A
Total for plan year	(5,796)	77,541
5. Ending value of assets July 1, 2016		
Trust assets: (1) + (2) - (3) + (4)	1,655,492	1,799,632
6. Approximate rate of return	-0.4%	4.8%



Relationship of Actuarial Value to Market Value

1. Market value 7/1/2016	\$1,655,492
2. Gain / (loss) not recognized in actuarial value 7/1/2016	(144,140)
3. Preliminary actuarial value 7/1/2016: (1) - (2)	1,799,632
4. Preliminary actuarial value as a percentage of market value: (3) ÷ (1)	108.7%
5. Gain / (loss) recognized for corridor minimum / maximum	N/A
6. Actuarial value 7/1/2016 after corridor minimum / maximum: (3) + (5)	1,799,632
7. Actuarial value as a percentage of market value: (6) ÷ (1)	108.7%

Development of Market Value Gain / Loss for 2015-2016 Plan Year

1. Market value 7/1/2015	\$1,473,187
2. Town contributions	105,755
3. Employee contributions	82,346
4. Benefit payments	0
5. Administrative expenses	0
6. Expected return at 7.50%	117,377
7. Expected value 7/1/2016: (1) + (2) + (3) - (4) - (5) + (6)	1,778,665
8. Market value 7/1/2016	1,655,492
9. Market value gain / (loss) for 2015-2016 plan year: (8) - (7)	(123,173)

Recognition of Gain / Loss in Actuarial Value

Year	(a) Gain / (loss)	(b) Total recognized as of 7/1/2015	(c) Recognized in current year: 20% of (a)	(d) Total recognized as of 7/1/2016: (b) + (c)	(e) Not recognized as of 7/1/2016: (a) - (d)
2011-2012	\$0	\$0	\$0	\$0	\$0
2012-2013	0	0	0	0	0
2013-2014	0	0	0	0	0
2014-2015	(76,004)	(15,201)	(15,201)	(30,402)	(45,602)
2015-2016	(123,173)	0	(24,635)	(24,635)	(98,538)
Total			(39,836)		(144,140)



Target Allocation and Expected Rate of Return July 1, 2016

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*	Weighting
Cash	4.00%	0.00%	0.00%
Equities	64.00%	5.25%	3.36%
Fixed Income	32.00%	2.00%	0.64%
	100.00%		4.00%
Long-Term Inflation Expectation			2.75%
Long-Term Expected Nominal Return			6.75%

**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 6.75% and 7.25%. An expected rate of return of 7.00% 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
2016 base	July 1, 2016	390,574	43,675	13	390,574



Member Data

The data reported by the Plan Sponsor for this valuation includes 9 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	10	0	0	10
Adjustments	0	0	0	0
Retirements	0	0	0	0
Disabilities	0	N/A	0	0
Terminations				
Vested	0	0	N/A	0
Lump sum payments	-1	0	N/A	-1
Due contributions only	0	N/A	N/A	0
Deaths				
With death benefit	0	0	0	0
Without death benefit	0	0	0	0
Transfers	0	0	N/A	0
Rehires	0	0	N/A	0
New beneficiaries	N/A	N/A	0	0
New entrants	0	N/A	N/A	0
Total members July 1, 2016	9	0	0	9



Member Data				
	Active	Terminated vested	Members in pay status	Total
Average age				
July 1, 2014	36.0	N/A	N/A	
July 1, 2016	37.5	N/A	N/A	
Average service				
July 1, 2014	9.0	N/A	N/A	
July 1, 2016	12.0	N/A	N/A	
Covered employee payroll				
July 1, 2014	\$673,883	N/A	N/A	\$673,883
July 1, 2016	665,300	N/A	N/A	665,300
Total annual benefits				
July 1, 2014	N/A	N/A	N/A	\$0
July 1, 2016	N/A	N/A	N/A	\$0



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. The Actuarial Value is adjusted, if necessary, to be within the range of 80% and 120% of the Market Value of assets.

Prior: Plan assets equal the Market Value of assets.

Actuarial Cost Method

A. Changes in Actuarial Cost Method: None.

B. 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 13 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 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.)

- Investment rate of return
- Rate of Compensation increase (including inflation)
- 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 and administrative expenses)

7.0%. (Prior: 7.5%)

Rate of compensation increase

2.75% inflation plus Service Merit Scale.

Service	Rate
0	7.0%
1	6.0%
2	5.0%
3	4.5%
4	4.0%
5	3.5%
6	3.0%
7	2.5%
8	2.0%
9	1.5%
10-14	1.0%
≥ 15	0.5%

(Prior: 3.0% inflation plus Service Merit Scale.)

The plan does not have statistically credible data on which to form a rate of compensation increase assumption. The assumption is based on input from the plan sponsor regarding future expectations, as well as knowledge that younger employees generally earn higher annual percentage increases than older employees.

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-2014 Adjusted to 2006 Blue Collar Mortality Table projected to valuation date with Scale MP-2016.

(Prior: RP-2000 Mortality Table with separate male and female rates, with no collar adjustment, combined tables for non-annuitants and annuitants, projected to the valuation date with Scale AA.)

Mortality Improvement

Projected to date of decrement using Scale MP-2016 (generational).

(Prior: Projected to date of decrement using Scale AA (Generational Mortality).)

We have selected this mortality assumption because it is based on the latest published pension mortality study released by the Society of Actuaries. The group composition of the Plan is consistent with the collar adjustment selected. At least 70 percent of the plan participants are either hourly or union.

The mortality assumption was updated to better reflect actual experience. The change in assumption decreased liabilities by about 2.5%.

Retirement age

Service based table

Service	Rate
20	10%
21-23	5%
24	60%
25	30%
26	40%
27	70%
≥27	100%

Retirement rates were based on rates used for plans with similar demographics and plan provisions. The plan does not have any experience upon which to base retirement rates.

Termination prior to retirement

None.

Administrative expenses

Plan expenses are assumed to be paid by the Town outside of the pension plan.



Summary of Plan Provisions

Effective Date of Plan

July 1, 2005.

Eligibility for Retirement

20 years of service.

Vesting

10 years of service.

Service

For eligibility, vesting and benefit accrual, no service is granted before 7/1/1999.

Average Salary

Average of the 3 highest years of base salary.

Pension Benefit

2.5% times average salary times years of service with a maximum pension of 60% of average salary.

Employee Contributions

Employee will contribute 12.5% of pay.

Post-retirement COLA

2.5%.

Normal Form of Pension

Life annuity.