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April 3, 2015

Ms. Brenda Halpin, Director
State of Connecticut
Office of the State Comptroller
Retirement Services Division
55 Elm Street
Hartford, CT 06106

Dear Ms. Halpin:

Enclosed is the "Report on the Biennial Valuation of the Connecticut Policemen and Firemen Survivors' Benefit Fund" prepared as of June 30, 2014.

Please let us know if there are any questions concerning the report.

Sincerely yours,

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary

JJG/EJK/KC

Enc.

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**CONNECTICUT POLICEMEN AND FIREMEN
SURVIVORS' BENEFIT FUND**

**ACTUARIAL VALUATION REPORT
PREPARED AS OF JUNE 30, 2014**





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April 3, 2015

State of Connecticut
State Employees Retirement Commission
55 Elm Street
Hartford, CT 06106

Members of the Commission:

Connecticut General Statutes Section 7-113 governs the operation of the Connecticut Policemen and Firemen Survivors' Benefit Fund (SBF). At the direction of the Commission, the actuary makes periodic valuations of the contingent assets and liabilities of the Benefit Fund. This report provides the results of the biennial actuarial valuation of the SBF prepared as of June 30, 2014. In preparing the valuation, the actuary relied on data provided by the Comptroller's Office. While not verifying data at the source, the actuary performed tests for consistency and reasonableness.

This valuation results in a decrease to the required employer normal contribution rate for the 2016 fiscal year from 1.54% to 1.17% of annual compensation. In addition, each participating employer is also assessed a \$60 per covered employee administrative expense. Please note that the resulting total contribution requirement for New Britain Police is determined by applying the 1.17% of annual compensation plus the \$60 per covered employee expense less \$4,852 due to the annual recognition of the remaining surplus allocated to that employer as of June 30, 2014.

The actuarial assumptions recommended by the actuary and adopted by the Commission are reasonably related to the experience under the System and to reasonable expectations of anticipated experience under the System. The valuation method used is the Entry Age Normal Frozen Initial Liability cost method. Gains and losses under this method will impact the employer normal contribution.

This is to certify that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as 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. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

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Members of the Commission
April 3, 2015
Page 2

The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely yours,

A handwritten signature in blue ink that reads 'John J. Garrett'.

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

JJG/EJK/KC

A handwritten signature in blue ink that reads 'Edward J. Koebel'.

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary



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**CONNECTICUT POLICEMEN AND FIREMEN SURVIVORS' BENEFIT FUND
ROLL FORWARD VALUATION REPORT
PREPARED AS OF JUNE 30, 2014**

SECTION I - SUMMARY OF PRINCIPAL RESULTS

1. For convenience of reference, the principal results of the 2012 biennial valuation, the 2013 roll forward valuation and the 2014 biennial valuation are summarized below. Recommended contributions for each participating employer are provided in Section III.

Valuation Date	June 30, 2014 Biennial Valuation	June 30, 2013* Roll Forward Valuation	June 30, 2012 Biennial Valuation**
Number of Active Members	591		598
Annual Compensation	\$47,385,319		\$ 48,463,318
Retired Members:			
Number	486		463
Deferred Vested Members:			
Number	29		N/A
Annuitant Members:			
Number	99		102
Annual Allowances	\$1,214,568		\$ 1,006,214
Assets:			
Market Value	\$ 27,190,169	\$ 23,975,868	\$ 22,551,431
Actuarial Value	\$ 25,928,660	\$ 23,759,530	\$ 23,102,082
Funded Ratio	71.7%		76.2%
For Fiscal Year Ending	June 30, 2016 and June 30, 2017	June 30, 2015	June 30, 2014
Employer Normal Contribution Rate:	1.17%	1.54%	1.23%

*Data on members was not updated as part of the roll forward valuation.

**Biennial valuation as of June 30, 2012 was provided by prior actuary.



2. Schedule A of this report presents the development of the actuarial value of assets. Schedule C details the actuarial assumptions and methods employed. Schedule D gives a summary of the benefit and contribution provisions of the plan.

SECTION II - ASSETS

1. As of June 30, 2014, the total market value of assets amounted to \$27,190,169 as reported by the Comptroller's Office compared to \$23,975,868 as of June 30, 2013. This represents an investment return of 14.32% for the fiscal year as compared to the assumed investment return of 8.00%. Schedule A shows the development of the actuarial value of assets as of June 30, 2014. The actuarial value of assets developed in this valuation is \$25,928,659 reflecting a rate of return on the actuarial value of 10.03%.
2. Schedule B shows receipts and disbursements of the System for the two years preceding the valuation date and a reconciliation of the fund balances at market value.



SECTION III – CONTRIBUTIONS PAYABLE BY EMPLOYER

The following table shows the comparison of the employer normal contribution rate payable by the employer as calculated in the June 30, 2012 biennial valuation and the June 30, 2014 biennial valuation. The 2014 valuation results apply to the fiscal years ending June 30, 2016 and June 30, 2017. These amounts include only the employer normal contribution rate. The recommended dollar amount for each entity is determined by applying the normal contribution rate to annual compensation at the beginning of the applicable fiscal year, plus the additional administrative expense of \$60 per covered employee. In addition, New Britain Police will subtract \$4,852 from the amount determined above due to the annual recognition of their surplus balance as of June 30, 2014. The asset surplus for all other towns has been fully recognized and is \$0 in the June 30, 2014 valuation.

CALCULATION OF ANNUAL NORMAL COST

	June 30, 2014	June 30, 2012*
(1) Actuarial Liabilities		
Present Value of Future Benefits Payable to:		
(a) Present Annuitants	\$ 10,027,159	\$ 8,285,505
(b) Present Retired Members	13,314,771	10,625,851
(c) Present Active Members	12,564,114	11,053,846
(d) Inactive Members	<u>275,048</u>	<u>360,542</u>
(e) Total Actuarial Liabilities	36,181,092	30,325,744
(2) Actuarial Value of Assets	25,928,659	23,102,082
(3) Present Value of Future Contributions by Members	4,752,646	3,371,919
(4) Asset Surplus for all towns except New Britain	0	(243,679)
(5) Unfunded Accrued Liability (Surplus) for New Britain	(52,486)	(54,343)
(6) Present Value of Future Employer Normal Costs		
(1e) – (2) – (3) – (4) – (5)	5,552,273	4,149,765
(7) Present Value of Future Salary	475,264,565	337,191,941
(8) Employer Normal Contribution Rate		
(6) / (7), not less than zero	1.17%	1.23%

* Results of the June 30, 2012 valuation were provided by prior actuary.



As can be seen in the previous table, our methodology in determining the Present Value of Future Salary differs from the methodology used by the prior actuary. The prior actuary was exposing all active members to the rates of retirement at age 45 regardless of whether they were eligible for retirement. We applied retirement decrements to active members only if eligible for retirement. This is the same methodology we use in the MERS valuation and recommend this methodology be used for this Plan going forward. Our result is a longer expected working lifetime and therefore, greater Present Value of Future Benefits and Present Value of Future Salary. However, since the change in this method increases the measures of both the future benefits and future contributions, the impact to required funding is minimal.

CALCULATION OF ESTIMATED CONTRIBUTIONS BY EMPLOYER*

Municipality	Active Members	Estimated Contributions for fiscal year ending June 30, 2016	Estimated Contributions for fiscal year ending June 30, 2015**
Derby Police	29	\$35,957	\$45,255
Manchester Fire	77	96,219	121,110
Middlefield Police	2	2,131	2,677
Milford Fire	103	112,162	140,960
Milford Police	105	111,938	140,643
New Britain Police	110	113,196	143,479
New London Fire	65	50,083	62,633
New London Police	66	61,143	76,681
Seymour Police	34	41,675	52,445
Total	591	\$624,504	\$785,883

* Estimated contribution amounts shown above include the \$60 administrative fee per active member and the offset for the New Britain Police municipality.

** The estimated contributions for fiscal year ending June 30, 2015 are based on the results of the June 30, 2013 Roll Forward Valuation using the 1.54% normal contribution rate and estimated compensation for the fiscal year.



SCHEDULE A

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	June 30, 2014	June 30, 2013
(1) Actuarial Value Beginning of Year*	\$23,759,530	\$23,102,082
(2) Market Value End of Year	27,190,169	23,975,868
(3) Market Value Beginning of Year	23,975,868	22,551,431
(4) Cash Flow		
(a) Contributions	871,487	525,490
(b) Disbursements	<u>(1,076,290)</u>	<u>(1,046,269)</u>
(c) Net: (4)(a) + (4)(b)	(204,803)	(520,779)
(5) Investment Income		
(a) Market Total: (2) – (3) – (4)(c)	3,419,104	1,945,216
(b) Assumed Rate	8.00%	8.00%
(c) Amount for Immediate Recognition: [(1) x (5)(b)] + [(4)(a) + (4)(b)] x (5)(b) x 0.5]	1,892,570	1,827,335
(d) Amount for Phased-In Recognition: (5)(a) – (5)(c)	1,526,534	117,880
(6) Phased-In Recognition of Investment Income		
(a) Current Year: (5)(d) * 0.2	305,307	23,576
(b) First Year Prior	23,576	(125,613)
(c) Second Year Prior	(125,613)	220,782
(d) Third Year Prior	220,782	57,310
(e) Fourth Year Prior	<u>57,310</u>	<u>(825,163)</u>
(f) Total Recognized Investment Gain	481,362	(649,109)
(7) Preliminary Actuarial Value End of Year: (1) + (4)(c) + (5)(c) + (6)(f)	25,928,659	23,759,530
(8) Final Actuarial Value End of Year Using 20% Corridor: Greater of [(7) and .8 x (2)], but no more than 1.2 x (2)	25,928,659	23,759,530
(9) Difference Between Market & Actuarial Values: (2) – (8)	1,261,510	216,338
(10) Rate of Return on Preliminary Actuarial Value	10.03%	5.16%

*Prior to Corridor Constraints, if applicable



SCHEDULE B

**SUMMARY OF RECEIPTS AND DISBURSEMENTS
(Market Value)**

	YEAR ENDING	
	June 30, 2014	June 30, 2013
<u>Receipts for the Year</u>		
Contributions:		
Members	\$521,450	\$471,545
Employer/Transfers	<u>350,037</u>	<u>53,945</u>
Subtotal	871,487	525,490
Investment Earnings (net of expenses)	3,419,104	1,945,216
TOTAL		
<u>Disbursements for the Year</u>		
Benefit Payments	(1,068,458)	(1,042,184)
Refunds to Members	<u>(7,832)</u>	<u>(4,085)</u>
TOTAL	(1,076,290)	(1,046,269)
<u>Excess of Receipts over Disbursements</u>	3,214,301	1,424,437
<u>Reconciliation of Asset Balances</u>		
Asset Balance as of the Beginning of Year *	23,975,868	22,551,431
Excess of Receipts over Disbursements	<u>3,214,301</u>	<u>1,424,437</u>
Asset Balance as of the End of Year	27,190,169	23,975,868
Rate of Return	14.32%	8.73%



SCHEDULE C

OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS

Adopted or reaffirmed by the Commission for the June 30, 2012 and later valuations.

VALUATION INTEREST RATE: 8.00% per annum, compounded annually, net of expenses.

SALARY INCREASES: Representative values of assumed annual rates of salary increase are as follows:

Age	Rate
25	11.00%
30	7.00%
35	6.00%
40	5.00%
45	4.50%
50	4.25%
55	4.25%
60	4.25%

SEPARATIONS FROM ACTIVE SERVICE: Representative values of the assumed annual rates of separation before service retirement are as follows:

Age	Withdrawal	Disability	Death	Service Retirement
25	7.0%	0.142%	0.008%	
30	5.0	0.149	0.011	
35	4.0	0.220	0.015	
40	2.0	0.318	0.023	
45	1.0	0.488	0.032	25%
50		1.105	0.050	20
55		3.029	0.077	12
60		6.884	0.122	20
65				100



DEATHS AFTER RETIREMENT: The RP2000 Mortality Table for Annuitants and Non-Annuitants (set forward one year for males and set back one year for females) is used for the period after retirement and for dependent beneficiaries. Representative values of the assumed annual rates of mortality are as follows:

Age	Men	Women	Age	Men	Women
40	0.114%	0.065%	65	1.441%	0.862%
45	0.162	0.103	70	2.457	1.486
50	0.245	0.155	75	4.217	2.546
55	0.420	0.242	80	7.204	4.151
60	0.768	0.444	85	12.280	6.952

For disabled retirees, the same table is used, adjusted with the male table set forward five years and the female table set forward one year. No mortality is assumed for children in receipt of a benefit.

ASSET METHOD: Actuarial Value, as developed in Schedule A. The method of valuing assets is intended to recognize a “smoothed” market value of assets. Under this method, the difference between actual return on market value from investment experience and the expected return on market value is recognized over a five-year period. The actuarial value of assets is constrained to an 80% to 120% corridor around market value of assets.

VALUATION METHOD: Entry Age Normal Frozen Initial Liability Cost method. Under this method, actuarial gains and losses will directly impact the normal contribution calculations of the employers. Initial liabilities for employer joining the Fund are determined upon entry and amortized over a 30-year period as a level dollar amount. This amortization amount is required in addition to the normal contribution and administrative expenses of the Fund.

SPOUSES: For members who have elected spouse coverage, husbands are assumed to be two years older than their wives.

PERCENT MARRIED: 90% of active members are assumed to be married.

LOADING: Since some retiree membership data has historically been reported without spousal information, a load has been added to more accurately reflect the potential retiree liability. The load factor is based on the assumed discount rate, post-retirement mortality tables and marital assumptions.



SCHEDULE D

SUMMARY OF MAIN BENEFIT AND CONTRIBUTION PROVISIONS

The Connecticut Policemen and Firemen Survivors' Benefit Fund became effective July 1, 1966. The following summary describes the main membership, benefits and contribution provisions of the Fund as interpreted for the valuation.

MEMBERSHIP

Any municipality may elect or vote to include any of its policemen and/or firemen as of the next following July 1st. Only full-time employees are eligible for membership.

BENEFITS

Survivor benefits are provided upon the death of an active or retired member of the Fund. Benefits are based on the annual rate of full-time pay on the date of death. For retired members, the rate of pay immediately prior to retirement is used.

The annual benefit payable from the date of death is equal to one of the following:

1. To a surviving spouse, an amount equal to 30% of pay.
2. To a surviving spouse with one dependent child under the age of 18, an amount equal to 45% of pay.
3. To a surviving spouse with two or more dependent children under the age of 18, an amount equal to 60% of pay.
4. To one dependent child under the age of 18 in the case where there is no benefit payable to a surviving spouse, an amount equal to 30% of pay.
5. To two or more dependent children under the age of 18 in the case where there is no benefit payable to a surviving spouse, an amount equal to 45% of pay.
6. To a depended parent in the case where there is no benefit payable to a surviving spouse or dependent child, an amount equal to 30% of pay.



Benefits to surviving spouses cease upon death or remarriage. Benefits to dependent children cease at age 18. Benefits to dependent parents cease upon death.

If there are no survivors eligible for a benefit on the date of the member's death, accumulated member contributions without interest are paid to a designated beneficiary of the member's estate.

CONTRIBUTIONS TO THE FUND

Active members contribute at the rate of 1.00% of salary. Participating municipalities contribute an amount as determined by the biennial actuarial valuation that is necessary to adequately fund all benefits. An annual administration fee of \$60 per active member is also paid by the employer.



SCHEDULE E

**DETAILED DISTRIBUTIONS OF THE DATA
Total Active Members as of June 30, 2014
Distributed by Age Group and Years of Service**

Age Group	Derby Police	Manchester Fire	Middlefield Police	Milford Fire	Milford Police	New Britain Police	New London Fire	New London Police	Seymour Police	Total	
										No.	Compensation
Under 25	0	2	0	2	6	11	0	1	1	23	1,305,311
25 to 29	5	5	0	19	15	26	9	6	0	85	5,758,676
30 to 34	6	8	0	13	21	26	5	9	4	92	7,255,651
35 to 39	1	12	0	18	15	16	4	8	5	79	6,720,304
40 to 44	5	12	0	12	17	18	9	12	10	95	8,052,895
45 to 49	6	21	2	19	14	12	12	16	7	109	9,621,729
50 to 54	1	12	0	12	8	0	15	7	3	58	4,611,582
55 to 59	4	4	0	8	6	1	8	6	1	38	3,091,688
60 & Up	1	1	0	0	3	0	3	1	3	12	967,483
Total	29	77	2	103	105	110	65	66	34	591	47,385,319

Average Age: 40.8

Average Service: 12.5

Average Pay: \$80,178



**Eligible Retirees and Deferred Vested Members as of June 30, 2014
Distributed by Age Group**

Age Group	Derby Police	Manchester Fire	Middlefield Police	Milford Fire	Milford Police	New Britain Police	New London Fire	New London Police	Seymour Police	Total Count
Under 30	0	0	0	0	0	2	2	7	1	12
30 to 34	0	0	0	0	0	4	2	6	1	13
35 to 39	0	0	0	1	2	2	0	0	0	5
40 to 44	0	1	0	1	0	1	0	2	0	5
45 to 49	0	3	0	8	11	0	0	5	1	28
50 to 54	3	2	0	15	21	1	1	10	1	54
55 to 59	1	9	0	16	18	1	2	12	1	60
60 to 64	2	7	0	16	19	0	4	4	5	57
65 to 69	2	21	0	21	17	0	12	12	3	88
70 to 74	4	14	0	20	13	0	9	9	4	73
75 to 79	4	10	0	7	4	0	4	5	5	39
80 to 84	0	1	0	3	11	0	4	6	1	26
85 to 89	0	3	0	11	4	0	3	6	2	29
90 & Up	2	0	0	6	7	0	5	4	2	26
Total	18	71	0	125	127	11	48	88	27	515

Average Age: 65.3



**Total Annuitants as of June 30, 2014
Distributed by Age Group**

Age Group	Derby Police	Manchester Fire	Middlefield Police	Milford Fire	Milford Police	New Britain Police	New London Fire	New London Police	Seymour Police	Total	
										No.	Annual Benefit
Under 30	0	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0	0
40 to 44	1	0	0	0	0	1	0	0	0	2	41,648
45 to 49	0	0	0	1	2	0	0	0	0	3	85,945
50 to 54	0	0	0	0	1	0	0	0	0	1	12,903
55 to 59	0	2	0	1	0	0	0	1	2	6	146,265
60 to 64	1	0	0	0	2	0	2	2	1	8	105,975
65 to 69	0	0	0	3	4	0	1	0	1	9	101,950
70 to 74	0	3	0	5	4	0	3	1	0	16	185,548
75 to 79	2	4	0	8	0	0	2	0	0	16	194,023
80 to 84	1	3	0	6	6	0	3	2	0	21	238,579
85 to 89	0	0	0	5	2	0	0	2	1	10	60,312
90 & Up	1	0	0	0	4	0	1	1	0	7	41,421
Total	6	12	0	29	25	1	12	9	5	99	1,214,568

Average Age: 74.9

Average Benefit: \$12,268