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

**ACTUARIAL VALUATION REPORT
PREPARED AS OF JUNE 30, 2019**





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

February 17, 2020

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 actuarial valuation of the SBF prepared as of June 30, 2019. 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 2021 fiscal year from 1.59% to 1.40% 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 1.40% 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, 2019.

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.

There were no changes in the actuarial assumptions or methods from the previous valuation.



Members of the Commission
February 17, 2020
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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.

The actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. Use of these computations for purposes other than meeting these requirements may not be appropriate.

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.

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

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

Edward J. Koebel, EA, FCA, MAAA
Chief Executive Officer



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Section I – Summary of Principal Results

CONNECTICUT POLICEMEN AND FIREMEN SURVIVORS' BENEFIT FUND

PREPARED AS OF JUNE 30, 2019

1. For convenience of reference, the principal results of the 2018 and the 2019 annual valuations are summarized below. Recommended contributions for each participating employer are provided in Section III.

Valuation Date	June 30, 2019	June 30, 2018
Number of Active Members	679	656
Annual Compensation	\$65,337,394	\$68,470,578
Retired Members:		
Number	366	445
Deferred Vested Members:		
Number	95	33
Annuitant Members:		
Number	102	102
Annual Allowances	\$1,288,761	\$1,415,724
Assets:		
Market Value	\$ 36,701,474	\$ 34,636,923
Actuarial Value	\$ 37,428,638	\$ 35,084,369
Funded Ratio	69.1%	65.0%
For Fiscal Year Ending	June 30, 2021	June 30, 2020
Employer Normal Contribution Rate*:	1.40%	1.59%

* The contribution rate for the 2018 valuation is calculated on an interim basis. Interim results are prior to potential change to assets that may result from an ongoing analysis of New London Fire's participation and reported compensation prior to July 1, 2017.





Section I – Summary of Principal Results

2. Schedule A of this report presents the development of the actuarial value of assets.

3. Schedule C of the report presents the development of the actuarial assumptions and methods employed. There have been no changes since the previous valuation.

4. Schedule D gives a summary of the benefit and contribution provisions of the plan. There have been no changes since the previous valuation.





Section II – Assets

1. As of June 30, 2019, the total market value of assets amounted to \$36,701,474 as reported by the Comptroller's Office. This represents an investment return of 5.62% for the fiscal year ending June 30, 2019. 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.
2. Schedule A shows the development of the actuarial value of assets as of June 30, 2019. The actuarial value of assets developed in this valuation is \$37,428,638 reflecting a rate of return on the actuarial value of 6.48% for fiscal year ending June 30, 2019.





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, 2018 and the June 30, 2019 annual valuations. The 2019 valuation results apply to the fiscal year ending June 30, 2021. 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, 2019. The asset surplus for all other towns has been fully recognized and is \$0 in the June 30, 2019 valuation.

CALCULATION OF ANNUAL NORMAL COST

	June 30, 2019	June 30, 2018
(1) Actuarial Liabilities		
Present Value of Future Benefits Payable to:		
(a) Present Annuitants	\$ 11,170,923	\$ 12,289,886
(b) Present Retired Members	16,646,463	14,637,567
(c) Present Active Members	24,791,326	25,482,594
(d) Inactive Members	<u>1,548,280</u>	<u>1,568,564</u>
(e) Total Actuarial Liabilities	\$ 54,156,992	\$ 53,978,611
(2) Actuarial Value of Assets	37,428,638	35,084,369
(3) Present Value of Future Contributions by Members	6,996,881	7,303,461
(4) Asset Surplus for all towns except New Britain	0	0
(5) Unfunded Accrued Liability (Surplus) for New Britain	(49,043)	(50,687)
(6) Present Value of Future Employer Normal Costs		
(1e) – (2) – (3) – (4) – (5)	9,780,516	11,641,468
(7) Present Value of Future Salary	699,688,131	730,346,124
(8) Employer Normal Contribution Rate		
(6) / (7), not less than zero	1.40%	1.59%

* The contribution rate for the 2018 valuation is calculated on an interim basis. Interim results are prior to potential change to assets that may result from an ongoing analysis of New London Fire's participation and reported compensation prior to July 1, 2017.





Section III – Contributions Payable By Employer

CALCULATION OF ESTIMATED CONTRIBUTIONS BY EMPLOYER*

Municipality	Active Members	Estimated Contributions for fiscal year ending June 30, 2021
Derby Police	34	\$69,635
Manchester Fire	79	150,371
Middlefield Police	0	0
Milford Fire	117	203,266
Milford Police	126	205,091
New Britain Police	142	255,243
New London Fire	63	101,150
New London Police	78	139,201
Seymour Police	40	68,590
Total	679	\$1,192,547

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





Schedule A – Development of Actuarial Value of Assets

		June 30, 2019
(1)	Actuarial Value Beginning of Year*	\$35,084,369
(2)	Market Value End of Year	36,701,474
(3)	Market Value Beginning of Year	34,636,923
(4)	Cash Flow	
	(a) Contributions	1,347,834
	(b) Disbursements	<u>(1,233,611)</u>
	(c) Net: (4)(a) + (4)(b)	114,223
(5)	Investment Income	
	(a) Market Total: (2) – (3) – (4)(c)	1,950,328
	(b) Assumed Rate	7.00%
	(c) Amount for Immediate Recognition: [(1) x (5)(b)] + [{"(4)(a) + (4)(b)} x (5)(b) x 0.5]	2,456,759
(6)	Expected Actuarial Value End of Year: (1) + (4)(c) + (5)(c)	\$37,610,429
(7)	Phased-In Recognition of Investment Income	
	(a) Difference Between Market & Expected Actuarial Value: (2) – (6)	(908,955)
	(b) 20% of Difference: 0.2 x (7)(a)	(181,791)
(8)	Preliminary Actuarial Value End of Year: (6) + (7)(b)	37,428,638
(9)	Final Actuarial Value End of Year Using 20% Corridor: Greater of [(8) and .8 x (2)], but no more than 1.2 x (2)	37,428,638
(10)	Difference Between Market & Actuarial Values: (2) – (9)	(727,164)
(11)	Rate of Return on Preliminary Actuarial Value	6.48%

* Prior to Corridor Constraints, if applicable





Schedule B – Summary of Receipts and Disbursements

(Market Value)

	YEAR ENDING	
	June 30, 2019	June 30, 2018
<u>Receipts for the Year</u>		
Contributions:		
Members	\$643,932	\$576,916
Employer/Transfers	<u>703,902</u>	<u>633,565</u>
Subtotal	1,347,834	1,210,481
Investment Earnings (net of expenses)	1,945,377	2,161,833
Other	<u>4,955</u>	<u>0</u>
TOTAL	3,298,166	3,372,314
<u>Disbursements for the Year</u>		
Benefit Payments and Refunds	(1,233,611)	(1,188,078)
Other	<u>(4)</u>	<u>(6,827)</u>
TOTAL	(1,233,615)	(1,194,905)
<u>Excess of Receipts over Disbursements</u>	2,064,551	2,177,409
<u>Reconciliation of Asset Balances</u>		
Asset Balance as of the Beginning of Year	34,636,923	32,459,514
Excess of Receipts over Disbursements	<u>2,064,551</u>	<u>2,177,409</u>
Asset Balance as of the End of Year	36,701,474	34,636,923
Rate of Return	5.62%	6.64%





Schedule C – Outline of Actuarial Assumptions and Methods

Adopted or reaffirmed by the Commission for the June 30, 2018 and later valuations.

VALUATION INTEREST RATE: 7.00% per annum, compounded annually, net of expenses.

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

Service	Annual Rates of		
	Merit & Seniority	Base (Economy)	Increase Next Year
0	7.00%	3.00%	10.00%
5	3.50%	3.00%	6.50%
10	1.90%	3.00%	4.90%
15	1.50%	3.00%	4.50%
20	1.38%	3.00%	4.38%
25	1.12%	3.00%	4.12%
30	0.70%	3.00%	3.70%
35	0.50%	3.00%	3.50%
40	0.50%	3.00%	3.50%

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

Age	Withdrawal and Vesting		Service Related Disability*	Death		Service Retirement
	0 – 4 years	5 – 24 years		Male	Female	
20	6.50%	5.00%	0.10%	0.06%	0.02%	
25	6.50	5.00	0.10	0.08	0.03	
30	5.75	4.00	0.10	0.08	0.03	
35	3.50	2.50	0.14	0.09	0.04	
40	3.50	2.00	0.22	0.10	0.06	
45	3.50	1.50	0.30	0.15	0.09	25.00%
50	3.50	0.00	0.64	0.25	0.14	15.00
55	3.50	0.00	2.40	0.41	0.24	13.00
60	3.50	0.00	4.80	0.67	0.34	15.00
65	0.00	0.00				100.00

*Non-Service related disability rates for Policemen and Firemen are assumed to be zero at all ages.





Schedule C – Outline of Actuarial Assumptions and Methods

DEATHS AFTER RETIREMENT: The RP-2014 Blue Collar Mortality Table adjusted to 2006 and projected to 2015 with Scale MP-2017 and projected to 2022 with Scale BB is used by Police and Fire for the period after retirement and for dependent beneficiaries. Representative values of the assumed annual rates of mortality are as follows:

Age	Male	Female	Age	Male	Female
40	0.101%	0.060%	65	1.370%	0.908%
45	0.148	0.092	70	1.996	1.405
50	0.568	0.406	75	3.149	2.316
55	0.845	0.505	80	5.174	3.862
60	0.987	0.657	85	8.632	6.650

For disabled retirees, the RP-2014 Disabled Retiree Mortality Table projected to 2020 by Scale BB is used.

ASSET METHOD: Actuarial Value, as developed in Schedule A. The actuarial value of assets recognizes 20% of any difference between actual and expected investment income (gain/loss) in the valuation year. In addition, the actuarial value of assets cannot be less than 80% or more than 120% of the 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.





Schedule D – Summary of Main Benefit and Contribution Provisions

CONTRIBUTIONS TO THE FUND

Active members contribute at the rate of 1.00% of salary. Participating municipalities contribute an amount as determined by the 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, 2019
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	1	4	0	2	2	8	4	1	3	25	1,346,653
25 to 29	5	4	0	10	21	21	4	9	9	83	7,090,963
30 to 34	6	16	0	26	25	36	13	13	4	139	12,942,508
35 to 39	8	7	0	14	25	29	6	14	4	107	10,480,942
40 to 44	1	13	0	22	11	19	2	7	3	78	8,469,929
45 to 49	5	8	0	11	20	18	9	8	9	88	8,920,453
50 to 54	4	16	0	14	8	9	6	17	7	81	8,771,180
55 to 59	3	9	0	13	5	1	13	5	1	50	4,741,985
60 & Up	1	2	0	5	9	1	6	4	0	28	2,572,781
Total	34	79	0	117	126	142	63	78	40	679	65,337,394

Average Age: 40.5

Average Service: 12.7

Average Pay: \$96,226





Schedule E – Detailed Distributions of the Data

Eligible Retirees and Deferred Vested Members as of June 30, 2019
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	1	1	0	1	0	5	0	3	1	12
30 to 34	0	1	0	2	3	7	1	1	2	17
35 to 39	1	0	0	3	2	7	4	2	0	19
40 to 44	0	0	0	4	7	6	1	1	0	19
45 to 49	1	4	0	3	7	4	1	2	1	23
50 to 54	2	12	0	14	17	4	6	8	5	70
55 to 59	2	5	0	16	24	1	3	10	3	64
60 to 64	3	11	0	15	17	0	5	14	1	66
65 to 69	6	8	0	14	9	0	6	5	8	56
70 to 74	1	17	0	10	2	0	10	10	5	55
75 to 79	3	12	0	4	4	0	3	3	3	32
80 to 84	2	5	0	1	2	0	4	1	5	20
85 to 89	0	2	0	0	0	0	1	0	1	4
90 & Up	0	1	0	1	2	0	0	0	0	4
Total	22	79	0	88	96	34	45	60	35	461

Average Age: 59.4





Schedule E – Detailed Distributions of the Data

Total Annuitants as of June 30, 2019
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	1	0	0	1	0	2	24,639
30 to 34	0	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	1	0	1	11,187
40 to 44	0	0	0	0	1	0	0	0	0	1	20,793
45 to 49	0	0	0	0	0	1	0	0	0	1	21,790
50 to 54	1	0	0	1	0	0	0	0	0	2	42,171
55 to 59	0	0	0	0	2	0	0	0	0	2	28,811
60 to 64	1	1	0	2	0	0	0	2	3	9	169,483
65 to 69	1	1	0	1	3	0	4	2	2	14	197,199
70 to 74	0	0	0	2	4	0	3	2	2	13	184,785
75 to 79	0	3	0	4	5	1	3	0	0	16	190,074
80 to 84	3	6	0	6	1	0	4	0	0	20	218,156
85 to 89	0	3	0	4	3	0	2	2	0	14	130,617
90 & Up	0	0	0	1	2	0	1	2	1	7	49,056
Total	6	14	0	21	22	2	17	12	8	102	1,288,761

Average Age: 74.1

Average Benefit: \$12,635

