

CITY OF HARTFORD
MUNICIPAL EMPLOYEES' RETIREMENT FUND (MERF)

Actuarial Valuation as of July 1, 2017

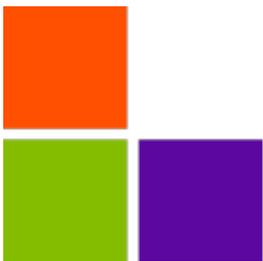




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Section I

Valuation Report

A. Purpose of the Valuation

The purpose of the valuation is to determine the funded status of the plan as well as the recommended cash contribution for the plan year. The information found in Section II of the report has been developed for this purpose.

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,

<i>City's ultimate</i>	=	<i>benefits</i>	+	<i>expenses</i>	-	<i>investment</i>	-	<i>employee</i>
<i>cost</i>		<i>paid</i>		<i>incurred</i>		<i>return</i>		<i>contributions</i>

B. Contribution for 2018-2019 Fiscal Year

The City's recommended contribution for the 2018-2019 fiscal year, determined from the July 1, 2017 actuarial valuation, is shown below. We have shown the recommended contribution for the 2018-2019 fiscal year as a percentage of payroll, as well as an *estimated* dollar amount. Also shown are last year's figures for comparison.

	Recommended 2018-2019 Fiscal Year Net Contribution (July 1, 2017 Valuation)		Recommended 2017-2018 Fiscal Year Net Contribution (July 1, 2016 Valuation)	
	% of payroll	\$ in millions (est.)	% of payroll	\$ in millions (est.)
Police	41.17%	\$15.36	42.23%	\$16.80
Firefighters	33.44%	\$11.59	35.49%	\$10.87
Board of Education	10.96%	\$4.78	9.50%	\$4.37
Municipal Services	51.82%	\$11.56	47.23%	\$11.42
Library	22.82%	<u>\$0.92</u>	22.94%	<u>\$0.91</u>
Total		\$44.21		\$44.37

Please see Section II, Exhibit A for the development of these figures.

The recommended City contribution is expressed as a percentage of the payroll for each of the five groups of employees covered by the plan: Police, Firefighters, Board of Education, Municipal Services, and Library. Under the contribution procedure currently used by the MERF, the annual contribution is first developed as a flat dollar amount for each group and then converted to a percentage of payroll using an *estimated* payroll figure. Each of those percentages is then applied against the *actual* payroll for each group for the fiscal year, to yield the *actual* dollar amount of the cash contribution that will be paid to the fund.



Section I Valuation Report (continued)

C. Funded Status

The funded status of the plan as of July 1, 2017 is summarized below. The figures are useful in accessing the health of the plan overall.

Specifically, the funded status is based on the smoothed (actuarial) value of assets used in the valuation, as well as a measure of the plan's liability known as the Actuarial Accrued Liability. The Actuarial Accrued Liability is the liability for benefits expected to be paid from the plan for inactive participants, as well as the liability for future expected benefit payments for active participants. For actives, the liability measure includes the impact of assumed future salary increases on projected benefits, but includes only that portion of their overall liability attributable to services rendered as of the valuation date.

	July 1, 2017
Actuarial Accrued Liability	\$1,441,361,000
Actuarial Value of Assets	<u>1,072,018,000</u>
Unfunded Status	369,343,000
Funded Percentage	74.4%

During the 2016-2017 fiscal year, the plan's funded status decreased from 74.8% as of July 1, 2016 to 74.4% as of July 1, 2017, as detailed above. This was mostly due to continued recognition of asset losses.

Even with a funded status of less than 100%, the plan is still in a healthy position with the ability to pay benefits due at the current 74.4% level. It is not the intent of the plan's funding method to fully fund such shortfalls in just one year. Absent of other significant changes, such underfunding will be reduced over a period of years as it is spread into future contribution requirements.

D. Plan Experience During Period Under Review

The recommended City contribution for the 2018-2019 fiscal year has decreased from last year by approximately \$0.2 million based on estimates of payroll. This decrease is the net impact of annual plan asset, liability experience, and assumption and method changes.

The July 1, 2016 Valuation produced a net City contribution of \$44.4 million for the 2017-2018 fiscal year. Based on July 1, 2017 participant data and assets, the 2018-2019 net City contribution is \$44.2 million.

During 2016-2017, the market value of assets increased from \$999.6 million to \$1,040.8 million, resulting in an asset return of approximately 10.4% over the period. In order to avoid dramatic fluctuations in contribution requirements with large swings in the market, a "smoothed" or "actuarial" value of assets is used to perform the valuation. This smoothed value recognizes the difference between the expected return on the market value of assets and the actual return over a 5-year period at 20% per year.

As of July 1, 2017, the actuarial value of assets used in the development of the contribution requirement was approximately \$1,072.0 million, \$31.2 million higher than the market value of assets of \$1,040.8 million at such date. The return for the year on the actuarial value was 6.3%. Since 6.3% is less than the MERF's 7.50% return assumption for the 2016-2017 plan year, asset losses were generated that increased the fiscal year 2018-2019 contribution requirement. Specifically, these losses represented approximately a \$1.4 million increase in contribution.

Changes in the plan's population and the resulting impact on plan liabilities and normal cost had the net effect of increasing the recommended City contribution by approximately \$0.5 million. While actual experience is reviewed each year and compared to expected, a full experience study is generally recommended every 5 years. The next study is expected to take place in 2021.



Section I

Valuation Report

(continued)

E. Changes Since The Last Valuation

An update to the mortality improvement scale was made to reflect the most recently published study by the Society of Actuaries. This update resulted in a \$6.95 million reduction in liability and \$760,000 reduction in contribution.

Finally plan changes within the groups impacted the contributions as follows:

- Fire – decreased contribution by \$130,000
- HMEA – decreased contribution by \$120,000
- Police – decreased contribution by \$1.1 million
- CHPEA – decreased contribution by \$25,000

F. Future Contribution Requirements

The use of a smoothed (actuarial) value of assets is meant to produce a more level funding pattern, given asset volatility. With a large decrease (increase) in the market, asset losses (gains) are spread over a five-year period, leveling out the recommended funding rather than providing for a spike (drop) in contribution requirements in one year.

As of July 1, 2017, there were approximately \$31.3 million in net unrecognized asset losses that eventually will be recognized in future City contribution requirements because of the use of this smoothing method. Additionally the City has elected to lower the investment return assumption to 7.375% with the July 1, 2018 Valuation.

Due to the outstanding asset losses and decreased investment return assumption, the City's contribution is expected to increase for the 2019-2020 fiscal year absent other significant changes.

To provide a sense of the level of expected future contributions, an estimate for the 2019-2020 fiscal year has been calculated. Specifically, the City's net estimated recommended contribution for that fiscal year is currently **\$47.8 million**. This figure is based on a projected market value of assets at July 1, 2018 of \$1,059.7 million, determined by projecting the market value of assets as of July 1, 2017 to June 30, 2018. Projected plan liabilities inherent in this calculation were based on the results of the July 1, 2017 valuation, including the assumptions, methods, and census data as of such date. The one exception is the investment return assumption. An interest rate of 7.375% was used in the development of the \$47.8 million estimated contribution figure. Lowering this assumption from 7.50% to 7.375% with the July 1, 2018 valuation increased the 2019-2020 contribution estimate by approximately \$1.8 million.

The projected asset value and estimated contribution for the 2019-2020 fiscal year assume the City funds the recommended contribution for 2017-2018. If the City contributes an amount other than the annual recommended contribution, the estimated future contribution will vary from the amount shown here.

The final 2019-2020 recommended contribution will be based upon final liabilities, assets, and the investment return and other actuarial assumptions used in the July 1, 2018 Actuarial Valuation.



Section I

Valuation Report

(continued)

G. Certification

This report presents the results of the July 1, 2017 Actuarial Valuation for the City of Hartford Municipal Employees' Retirement Fund (MERF) (the Plan) for the purpose of estimating the funded status of the Plan and determining the Actuarial Determined Contribution (ADC) for the fiscal year ending June 30, 2019. This report is intended to satisfy the requirements of Connecticut General Statute 7-450a.

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 and asset and contribution information provided by the Plan Sponsor. 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 such factors as: 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 am a member of the American Academy of Actuaries and meet its Qualification Standards to render the actuarial opinion contained herein.

Ellen A. Kucenski, FSA, MAAA
Enrolled Actuary 17-07674

March 20, 2018



Section II

Supporting Exhibits

A. Entry Age Normal Actuarial Accrued Liability as of July 1, 2017

	Police	Firefighters	Board Of Education	Municipal Services	Library	Total Membership
A. Covered Payroll						
Annual Payroll (000)	\$36,411	\$33,777	\$45,215	\$21,720	\$3,944	\$141,067
B. Actuarial Accrued Liability (AAL)						
Entry Age Normal AAL (000)						
1. Active Members						
a. Active Members' MERF Liability	\$105,084	\$85,257	\$86,213	\$48,874	\$8,028	\$333,456
b. Local 566 Payment Present Value	0	0	1,120	0	0	1,120
c. Local 1716 Payment Present Value	0	0	0	0	0	0
d. Total for Active Members	105,084	85,257	87,333	48,874	8,028	334,576
2. Terminated Non-Vested Members [allocated by (1d)]	567	460	465	264	43	1,799
3. Terminated Vested Members	1,421	1,772	12,378	8,683	371	24,625
4. Retired Members	373,545	297,793	111,898	278,481	18,330	1,080,047
5. Old Plans Cola 1987/1990/1997/1999/2001/2005/2007	183	95	28	8	0	314
6. Total	480,800	385,377	212,102	336,310	26,772	1,441,361
C. Valuation Assets (Adjusted Value)						
1. Amount prior to Recognizing Receivable (000)	\$354,797	\$285,242	\$176,998	\$234,756	\$20,225	\$1,072,018
2. Contribution Receivable (000)	0	0	0	0	0	0
3. Valuation Assets after Recognition of Receivable (000)	354,797	285,242	176,998	234,756	20,225	1,072,018
D. Unfunded Actuarial Accrued Liability (000)	\$126,003	\$100,135	\$35,104	\$101,554	\$6,547	\$369,343
E. Funded Percent (C. / B.)	73.8%	74.0%	83.4%	69.8%	75.5%	74.4%



Section II
Supporting Exhibits (continued)
B. Cash Contributions
July 1, 2018 – June 30, 2019 Fiscal Year Contribution

	Police	Firefighters	Board Of Education	Municipal Services	Library	Total Membership
1. Development of Amortization						
a. Unfunded Actuarial Accrued Liability	\$126,003,062	\$100,134,320	\$35,104,465	\$101,554,006	\$6,546,761	\$369,342,614
b. Amortization of Unfunded AAL (24 year closed)	10,522,422	7,920,036	2,738,336	8,181,366	566,012	29,928,172
c. Amortization of Unfunded AAL (15 year open)	186,328	698,157	292,311	522,613	(14,329)	1,685,080
d. Total Amortization	10,708,750	8,618,193	3,030,647	8,703,979	551,683	31,613,252
2. Normal Cost Development						
a. Normal Cost Beginning of Year prior to Expense Load	\$3,035,580	\$1,738,607	\$1,387,982	\$1,706,203	\$270,743	\$8,139,115
b. Normal Cost Projected One Year prior to Expense Load	3,263,249	1,869,003	1,492,081	1,834,168	291,049	8,749,549
c. Expense Load (Allocated by AAL)	881,989	706,942	389,084	616,932	49,111	2,644,058
3. Fiscal Year Contribution for 07/01/2018 - 06/30/2019						
I. Gross City Contribution						
a. Total Contribution Due as of Beginning of Year (1d+2b+2c)	14,853,987	11,194,137	4,911,812	11,155,080	891,843	43,006,859
b. Total Interest Adjusted Gross City Contribution	15,400,942	11,606,328	5,092,675	11,565,833	924,683	44,590,460
II. Annual Adjusted Payroll as of 07/01/2017 w proj	37,412,645	34,705,661	46,458,846	22,317,370	4,051,953	144,946,475
III. Contribution as a % of Payroll prior to adjustments	41.17%	33.44%	10.96%	51.82%	22.82%	30.76%
IV. 07/01/2018 Payment for Local 566 (000)	0	0	303,918	0	0	303,918
V. 07/01/2018 Payment for Local 1716 (000)	0	0	0	0	0	0
VI. Old Plans COLA Annual Payment (000)	40,318	21,221	7,668	2,056	0	71,263
VII Net City Contribution [(I.) - (IV.) - (V.) - (VI.)]	15,360,624	11,585,107	4,781,089	11,563,777	924,683	44,215,279

	2018 - 2019 Contribution Sensitivity*					
	Police	Firefighters	Board of Education	Municipal Services	Library	Total
Estimated Fiscal Year Payroll +5%	\$39,283,277	\$36,440,944	\$48,781,788	\$23,433,239	\$4,254,551	\$152,193,799
Net City Contribution Estimate	16,132,607	12,164,631	5,034,898	12,141,048	970,889	46,444,073
Estimated Fiscal Year Payroll -5%	35,542,013	32,970,378	44,135,904	21,201,502	3,849,355	137,699,152
Net City Contribution Estimate	14,592,329	11,004,073	4,525,709	10,984,562	878,423	41,985,096

*Based on contribution policy of depositing a % of payroll using actual fiscal year payroll.



Section II

Supporting Exhibits

(continued)

C. Actuarial Balance Sheet

	July 1, 2017	July 1, 2016
Actuarial Liabilities		
Present Value of Future Benefits for:		
Active Employees	\$506,977,908	\$538,716,685
Inactive Members		
• Regular Retirees	982,519,533	946,740,544
• Disability Retirees	76,631,721	75,523,523
• Survivors	20,895,065	22,069,312
• Terminated Non-Vesteds	1,800,000	1,300,000
• Terminated Vesteds	24,624,297	24,279,902
• Old Plans COLA	<u>313,858</u>	<u>419,321</u>
TOTAL	\$1,613,762,382	\$1,609,049,287
Source of Funds		
1. Actuarial Value of Assets	\$1,072,017,906	\$1,066,749,972
2. Present Value of Future Employee Contributions	103,199,127	97,592,435
3. Present Value of Future City Normal Cost Contributions	69,202,235	86,078,588
4. Unfunded Accrued Liability	<u>369,342,614</u>	<u>358,628,292</u>
5. TOTAL = (1) + (2) + (3) + (4)	\$1,613,762,382	\$1,609,049,287



Section II

Supporting Exhibits

(continued)

D. Value of Accrued Benefits as of July 1, 2017

	Police	Firefighters	Board Of Education	Municipal Services	Library	Total Membership
A. Covered Payroll						
Annual Payroll	\$36,411	\$33,777	\$45,215	\$21,720	\$3,944	\$141,067
B. Actuarial Accrued Liability (AAL)						
Unit Credit AAL						
1. Active Members						
a. Active Members' MERF Liability	\$68,320	\$66,576	\$60,424	\$40,249	\$6,291	\$241,860
b. Local 566 Payment Present Value	0	0	1,120	0	0	1,120
c. Local 1716 Payment Present Value	0	0	0	0	0	0
d. Total for Active Members	68,320	66,576	61,544	40,249	6,291	242,980
2. Terminated Non-Vested Members [allocated by (1d)]	567	460	465	264	43	1,799
3. Terminated Vested Members	1,421	1,772	12,378	8,683	371	24,625
4. Retired Members	373,545	297,793	111,898	278,481	18,330	1,080,047
5. Old Plans Cola 1987/1990/1997/1999/2001/2005/2007	183	95	28	8	0	314
6. Total	444,036	366,696	186,313	327,685	25,035	1,349,765



Section II
Supporting Exhibits
(continued)

E. Development of Asset Values

The Actuarial Value of assets is used in the determination of plan contributions. It phases in recognition of asset gains and losses. A method of smoothing is used because the Market Value can swing widely from one year to the next, resulting in undesirable fluctuations in pension contributions. The smoothing is accomplished by recognizing asset gains and losses over a five-year period at 20% per year.

Relationship of Actuarial Value to Market Value	
1. Market value 7/1/2017	\$ 1,040,756,831
2. Gain / (loss) not recognized in actuarial value 7/1/2017	(31,261,075)
3. Preliminary actuarial value 7/1/2017: (1)-(2)	1,072,017,906
4. Preliminary actuarial value as a percentage of market value: (3)÷(1)	103.0%
5. Gain / (loss) recognized for corridor min/max	N/A
6. Actuarial value 7/1/2017 after corridor min/max: (3)+(5)	1,072,017,906
7. Actuarial value as a percentage of market value: (6)÷(1)	103.0%

Development of Asset Gain / (Loss) for 2016-2017 Plan Year	
1. Market value 7/1/2016	\$ 999,612,429
2. Contributions	50,824,822
3. Benefit payments	108,145,127
4. Administrative expenses	2,653,213
5. Expected return at 7.50%	72,781,061
6. Expected value 7/1/2017: (1)+(2)-(3)-(4)+(5)	1,012,419,972
7. Market value 7/1/2017	1,040,756,831
8. Asset gain / (loss) for -1 Plan Year: (7)-(6)	28,336,859

Recognition of Gain / (Loss) in Actuarial Value					
	(a)	(b)	(c)	(d)	(e)
Year	Gain / (loss)	Recognized as of 7/1/2016	Recognized in current year: 20% of (a)	Total recognized as of 7/1/2017: (b)+(c)	Not recognized as of 7/1/2017: (a)-(d)
2012-2013	\$ 3,810,109	\$ 3,048,088	\$ 762,021	\$ 3,810,109	\$ 0
2013-2014	59,992,444	35,995,467	11,998,489	47,993,956	11,998,488
2014-2015	(59,867,117)	(23,946,846)	(11,973,423)	(35,920,269)	(23,946,848)
2015-2016	(69,970,338)	(13,994,068)	(13,994,068)	(27,988,136)	(41,982,202)
2016-2017	28,336,859	0	<u>5,667,372</u>	5,667,372	<u>22,669,487</u>
Total			(7,539,609)		(31,261,075)



Section II

Supporting Exhibits

(continued)

E. Development of Asset Values

Summary of Fund Activity		
	Market Value	Actuarial Value
1. Beginning value 7/1/2016		
a. Trust assets	\$ 999,612,429	\$ 1,066,749,972
b. Accrued contribution	0	0
c. Benefits payable	0	0
d. Administrative expenses payable	0	0
e. Net: (a)+(b)-(c)-(d)	999,612,429	1,066,749,972
2. Contributions		
a. Employer contributions during year	37,649,802	37,649,802
b. Employee contributions during year	13,175,020	13,175,020
c. Change in accrued contribution	0	0
d. Total for plan year	50,824,822	50,824,822
3. Disbursements		
a. Benefit payments during year	108,145,127	108,145,127
b. Administrative expenses during year	2,653,213	2,653,213
c. Change in benefits payable	0	0
d. Change in administrative expenses payable	0	0
e. Total for plan year	110,798,340	110,798,340
4. Net investment return		
a. Interest and dividends	15,254,322	N/A
b. Change in accrued income	0	N/A
c. Realized gain (loss)	37,499,024	N/A
d. Unrealized gain (loss)	55,580,064	N/A
e. Expected return	N/A	72,781,061
f. Recognized gain (loss)	N/A	(7,539,609)
g. Required adjustment due to corridor	N/A	0
h. Reversal of prior year required adjustment	N/A	0
i. Investment-related expenses	(7,215,490)	N/A
j. Total	101,117,920	65,241,452
5. Ending value 7/1/2017		
a. Trust assets: (1a)+(2a)-(3a)-(3b)+(4j)	1,040,756,831	1,072,017,906
b. Accrued contribution	0	0
c. Benefits payable	0	0
d. Administrative expenses payable	0	0
e. Net: (a)+(b)-(c)-(d)	1,040,756,831	1,072,017,906
6. Approximate rate of return 2016-2017	10.4%	6.3%



Section II

Supporting Exhibits

(continued)

E. Development of Asset Values

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	-1.9%	10.8%	6.6%	8.7%
2009	-15.0%	11.1%	10.4%	8.3%
2010	11.1%	-2.5%	9.0%	8.3%
2011	17.7%	3.6%	2.7%	6.3%
2012	1.9%	10.0%	2.1%	3.7%
2013	8.4%	9.1%	4.2%	5.7%
2014	14.1%	8.0%	10.5%	6.2%
2015	2.0%	8.1%	8.6%	6.6%
2016	0.9%	5.5%	5.3%	6.5%
2017	10.4%	4.3%	7.0%	4.6%



Section II

Supporting Exhibits

(continued)

F. Membership Data

Summary – Active Members as of July 1, 2017

	Number	Payroll*	Average Annual Pay*
Police	402	\$36,411,333	\$90,575
Firefighters	275	33,776,799	122,825
Board of Education	926	45,215,422	48,829
Municipal Services	336	21,720,068	64,643
Library	68	3,943,507	57,993
Total	2,007	\$141,067,129	\$70,288

*Basic salary plus overtime.

Summary – Pensioners as of July 1, 2017

	Service Pensions*		Disability Pensions		Survivor Benefits*		Total	
	Count	Total Monthly Annuities	Count	Total Monthly Annuities	Count	Total Monthly Annuities	Count	Total Monthly Annuities
Police	549	\$2,687,098	73	\$157,733	117	\$68,437	739	\$2,913,268
Firefighters	391	2,069,314	120	324,572	133	91,198	644	2,485,084
Board of Ed.	651	1,029,753	21	9,687	67	15,200	739	1,054,640
Municipal Svcs.	789	2,321,077	9	7,706	112	40,169	910	2,368,952
Library	81	170,946	3	1,867	4	930	88	173,743
Vested Deferred	262	314,908	--	--	--	--	262	314,908
TOTAL**	2,723	\$8,593,096	226	\$501,565	433	\$215,934	3,382	\$9,310,595

* 19 pensioners receiving benefits as retirees and as survivors are included in both groups.

** Additional monthly benefits for the July 1, 1987, July 1, 1990, July 1, 1997, July 1, 1999, July 1, 2001, July 1, 2005, and July 1, 2007 COLA's for the unfunded plans (PBF, FRF, and RAF) are also included in the total liabilities for MERF. Such participants are not included in the counts shown here.



Section II

Supporting Exhibits

(continued)

F. Membership Data

Data Reconciliation – Police

Participant Data				
	Active	Terminated Vested	Pensioners	Total
Total Participants 7/1/2016	411	7	725	1,143
Adjustments	+4	0	-1	+3
Retirements	-21	-1	+22	0
Disabilities	-1	0	+1	0
Terminations				
Vested	-5	+5	N/A	0
Non-vested	0	N/A	N/A	0
Deaths	0	0	-15	-15
New beneficiaries	N/A	0	+7	+7
Lump Sum Settlements	N/A	-1	0	-1
Transfer group	0	0	0	0
Rehires	+1	-1	0	0
New entrants	<u>+13</u>	<u>N/A</u>	<u>N/A</u>	<u>+13</u>
Total Participants 7/1/2017	402	9	739	1,150
Average Age				
7/1/2016	40.1			
7/1/2017	40.0			
Average Service				
7/1/2016	11.2			
7/1/2017	11.2			
Payroll**				
7/1/2016	\$38,824,078			
7/1/2017	36,411,333			
Total monthly benefits*				
7/1/2016		\$13,879	\$2,772,998	
7/1/2017		14,610	2,913,269	

* Excludes old plan COLA participants.



Section II

Supporting Exhibits

(continued)

F. Membership Data

Data Reconciliation – Firefighters

Participant Data				
	Active	Terminated Vested	Pensioners	Total
Total Participants 7/1/2016	293	4	636	933
Adjustments	+2	0	0	+2
Retirements	-15	0	+15	0
Disabilities	-2	-1	+3	0
Terminations				
Vested	-4	+4	N/A	0
Non-vested	-1	N/A	N/A	-1
Deaths	-1	0	-15	-16
New beneficiaries	N/A	0	+5	+5
Lump Sum Settlements	N/A	0	0	0
Transfer group	0	0	0	0
Rehires	0	0	0	0
New entrants	<u>+3</u>	<u>N/A</u>	<u>N/A</u>	<u>+3</u>
Total Participants 7/1/2017	275	7	644	926
Average Age				
7/1/2016	40.1			
7/1/2017	40.2			
Average Service				
7/1/2016	12.3			
7/1/2017	12.6			
Payroll**				
7/1/2016	\$29,905,435			
7/1/2017	33,776,799			
Total monthly benefits*				
7/1/2016		\$10,372	\$2,403,716	
7/1/2017		14,610	2,485,084	

* Excludes old plan COLA participants.



Section II

Supporting Exhibits

(continued)

F. Membership Data

Data Reconciliation – Board of Education

Participant Data				
	Active	Terminated Vested	Pensioners	Total
Total Participants 7/1/2016	995	112	711	1,818
Adjustments	0	-1	0	-1
Retirements	-26	-21	+47	0
Disabilities	-1	0	+1	0
Terminations				
Vested	-62	+62	N/A	0
Non-vested	-47	N/A	N/A	-47
Deaths	0	0	-27	-27
New beneficiaries	N/A	0	+7	+7
Lump Sum Settlements	N/A	-2	0	-2
Transfer group	0	0	0	0
Rehires	+1	-1	0	0
New entrants	<u>+66</u>	<u>N/A</u>	<u>N/A</u>	<u>+66</u>
Total Participants 7/1/2017	926	149	739	1,814
Average Age				
7/1/2016	47.6			
7/1/2017	48.0			
Average Service				
7/1/2016	10.9			
7/1/2017	11.4			
Payroll**				
7/1/2016	\$48,002,256			
7/1/2017	45,215,422			
Total monthly benefits*				
7/1/2016		\$124,065	\$1,001,710	
7/1/2017		174,895	1,054,640	

* Excludes old plan COLA participants.



Section II

Supporting Exhibits

(continued)

F. Membership Data

Data Reconciliation – Municipal Services

Participant Data				
	Active	Terminated Vested	Pensioners	Total
Total Participants 7/1/2016	380	88	883	1,351
Adjustments	-6	+2	0	-4
Retirements	-29	-13	+42	0
Disabilities	0	0	0	0
Terminations				
Vested	-13	+13	N/A	0
Non-vested	-17	N/A	N/A	-17
Deaths	0	0	-23	-23
New beneficiaries	N/A	0	+8	+8
Lump Sum Settlements	N/A	-4	0	-4
Transfer group	0	0	0	0
Rehires	0	0	0	0
New entrants	<u>+21</u>	<u>N/A</u>	<u>N/A</u>	<u>+21</u>
Total Participants 7/1/2017	336	86	910	1,332
Average Age				
7/1/2016	48.9			
7/1/2017	49.5			
Average Service				
7/1/2016	11.0			
7/1/2017	11.7			
Payroll**				
7/1/2016	\$23,538,274			
7/1/2017	21,720,068			
Total monthly benefits*				
7/1/2016		\$107,361	\$2,298,700	
7/1/2017		99,046	2,368,952	

* Excludes old plan COLA participants.



Section II

Supporting Exhibits

(continued)

F. Membership Data

Data Reconciliation – Library

Participant Data				
	Active	Terminated Vested	Pensioners	Total
Total Participants 7/1/2016	70	7	88	165
Adjustments	0	0	0	0
Retirements	-3	0	+3	0
Disabilities	-1	0	+1	0
Terminations				
Vested	-5	+5	N/A	0
Non-vested	-7	N/A	N/A	-7
Deaths	0	0	-4	-4
New beneficiaries	N/A	0	0	0
Lump Sum Settlements	N/A	-1	0	-1
Transfer group	0	0	0	0
Rehires	0	0	0	0
New entrants	<u>+14</u>	<u>N/A</u>	<u>N/A</u>	<u>+14</u>
Total Participants 7/1/2017	68	11	88	167
Average Age				
7/1/2016	46.2			
7/1/2017	47.0			
Average Service				
7/1/2016	12.3			
7/1/2017	11.5			
Payroll**				
7/1/2016	\$3,851,862			
7/1/2017	3,943,507			
Total monthly benefits*				
7/1/2016		\$4,486	\$166,766	
7/1/2017		6,537	173,743	

* Excludes old plan COLA participants.



Section II

Supporting Exhibits

(continued)

F. Membership Data

Data Reconciliation – Total

Participant Data				
	Active	Terminated Vested	Pensioners	Total
Total Participants 7/1/2016	2,149	218	3,043	5,410
Adjustments	0	+1	-1	0
Retirements	-94	-35	+129	0
Disabilities	-5	-1	+6	0
Terminations				
Vested	-89	+89	N/A	0
Non-vested	-72	N/A	N/A	-72
Deaths	-1	0	-84	-85
New beneficiaries	N/A	0	+27	+27
Lump Sum Settlements	N/A	-8	0	-8
Transfer group	0	0	0	0
Rehires	+2	-2	0	0
New entrants	<u>+117</u>	<u>N/A</u>	<u>N/A</u>	<u>+117</u>
Total Participants 7/1/2017	2,007	262	3,120	5,389
Payroll				
7/1/2016	\$144,121,905			
7/1/2017	141,067,129			
Total monthly benefits*				
7/1/2016		\$260,163	\$8,643,890	
7/1/2017		314,908	8,995,687	

* Excludes old plan COLA participants.



Age, Service, Salary Information for City of Hartford MERF - Police

Attained Age	Completed Years of Credited Service																					
	Under 1		1 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 and over		All years	
	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.
Under 25	4	43,465	11	50,599																	15	48,696
25 to 29	4	43,465	15	59,993	5	82,481	3	84,597													27	64,442
30 to 34	2	43,465	9	61,714	56	91,017	19	99,779													86	88,754
35 to 39	2	43,465	1	73,661	23	87,946	44	102,043	13	105,166	1	85,004									84	96,731
40 to 44			1	81,820	18	86,741	37	101,502	17	99,262	4	98,346									77	97,137
45 to 49			2	58,387	5	94,483	28	96,493	19	104,439	8	96,984									62	97,600
50 to 54					9	98,214	10	94,856	8	89,454	5	95,967									32	94,624
55 to 59					3	78,196	5	98,435	2	88,192	1	118,885	5	73,510	1	114,777					17	88,492
60 to 64											1	74,925					1	95,519			2	85,222
65 to 69																						
70 & over																						
All ages	12	43,465	39	58,568	119	89,774	146	99,572	59	100,525	20	96,395	5	73,510	1	114,777	1	95,519			402	90,707



Age, Service, Salary Information for City of Hartford MERF - Fire

Attained Age	Completed Years of Credited Service												All years										
	Under 1		1 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 and over		All years		
	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	
Under 25																							
25 to 29	1	66,512	16	75,885	17	84,330	1	75,444													35	79,707	
30 to 34			14	76,150	34	87,858															48	84,370	
35 to 39			9	78,241	26	88,066	9	97,561	5	88,078	1	87,223									50	87,991	
40 to 44			2	76,855	17	85,621	9	90,051	22	92,432	10	100,945	2	85,192							62	90,856	
45 to 49			2	76,855	3	84,722	7	96,225	10	100,797	21	103,234									43	99,008	
50 to 54			1	75,444	1	83,781	4	96,556	11	89,685	10	109,275			2	96,546					29	97,166	
55 to 59					1	87,223	1	92,100	2	87,223	3	99,917									7	93,360	
60 to 64											1	87,223									1	87,223	
65 to 69																							
70 & over																							
All ages	1	66,512	44	76,529	99	86,769	31	94,060	50	92,857	46	103,137	2	85,192	2	96,546					275	89,794	



Age, Service, Salary Information for City of Hartford MERF - Board of Education

Attained Age	Completed Years of Credited Service																					
	Under 1		1 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 and over		All years	
	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.
Under 25	5	38,638	4	42,479																	9	40,345
25 to 29	15	35,006	40	37,304	2	72,775															57	37,944
30 to 34	7	40,863	45	43,144	15	42,133	9	41,634													76	42,548
35 to 39	4	46,247	32	47,899	28	50,994	27	43,434	9	39,266											100	46,717
40 to 44	7	33,765	25	45,934	19	48,335	26	54,893	19	43,223	8	48,418	1	37,718							105	47,396
45 to 49	10	39,820	39	45,410	23	63,204	30	43,970	23	58,396	17	48,623	7	43,395			1	87,525			150	50,020
50 to 54	7	34,639	24	39,033	21	56,494	32	53,300	36	56,601	22	54,414	10	51,402	3	65,643					155	51,691
55 to 59	2	32,971	12	41,269	12	64,243	28	49,047	18	41,150	23	44,371	5	41,727	4	64,479	2	37,230	1	96,573	107	47,703
60 to 64	5	42,238	15	38,803	13	38,816	19	51,634	21	51,565	12	48,487	7	42,496	9	56,944	4	59,489	2	40,658	107	47,410
65 to 69			2	30,461	6	39,095	7	37,205	11	53,526	5	53,446	7	54,694	2	39,664			1	42,984	41	46,759
70 & over			1	31,375			6	59,358	5	45,142	2	60,581			1	60,105	1	38,320	3	39,176	19	50,018
All ages	62	37,798	239	42,516	139	52,330	184	48,752	142	50,616	89	49,458	37	47,148	19	58,251	8	54,783	7	48,343	926	47,482



Age, Service, Salary Information for City of Hartford MERF - Municipal Services

Attained Age	Completed Years of Credited Service														All years							
	Under 1		1 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 and over		No.	Avg. Comp.
	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.
Under 25	1	55,000	3	30,164																	4	36,373
25 to 29	4	56,578	6	55,055	5	48,420															15	53,249
30 to 34	2	56,445	17	63,441	11	55,548	3	65,464													33	60,654
35 to 39	1	65,000	12	63,370	8	63,183	5	70,009	5	72,128											31	65,858
40 to 44	2	112,500	5	68,747	12	72,000	11	68,057	6	84,923	2	83,344	2	87,038							40	75,792
45 to 49	3	57,346	2	121,751	11	70,138	10	82,299	5	80,771	1	48,503	2	97,994	1	73,264			1	61,468	36	77,587
50 to 54	1	85,000	8	61,411	11	81,561	9	56,591	12	55,579	6	65,771	3	39,403	1	65,226	1	61,468	4	66,027	56	63,453
55 to 59	1	61,807	3	41,510	7	48,251	15	79,634	10	52,707	4	83,621	4	36,999	1	72,811					45	62,244
60 to 64	2	96,164	5	90,857	7	92,596	13	62,795	10	59,980	4	74,492	3	34,307	3	78,286	1	61,468			48	71,003
65 to 69			3	47,810	2	45,283	2	58,675	3	33,896	2	10,998			1	73,416	1	7,573			14	39,716
70 & over			2	77,009	3	28,693	4	49,007	3	34,291	1	10,998	1	10,998							14	40,071
All ages	17	70,316	66	63,851	77	65,634	72	68,772	54	60,600	20	63,763	15	50,013	6	74,360	3	65,450	6	55,525	336	64,547



Age, Service, Salary Information for City of Hartford MERF - Library

Attained Age	Completed Years of Credited Service												All years										
	Under 1		1 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 and over		All years		
	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	
Under 25																							
25 to 29	1	48,668	2	47,383			1	43,975													4	46,852	
30 to 34	1	52,195	5	55,742					1	40,758											7	53,095	
35 to 39	4	59,247	4	67,250	1	64,363	1	44,099			1	55,016									11	60,861	
40 to 44			1	56,427	1	45,767							1	40,758							3	47,650	
45 to 49	2	46,001	2	120,032			5	57,819			2	55,297	2	53,601	1	48,504					14	63,390	
50 to 54	1	55,016	3	49,898			2	58,999	1	78,355	2	53,728	1	43,975	2	42,378					12	53,104	
55 to 59					3	87,535	1	56,427	2	71,636			2	43,881	1	64,891	1	40,758			10	65,571	
60 to 64	1	58,037					1	43,975							1	50,784					3	50,932	
65 to 69			1	60,024	1	52,195			1	40,758											3	50,992	
70 & over	1	85,818																			1	85,818	
All ages	11	57,157	18	63,816	6	70,821	11	54,143	5	60,628	5	54,613	6	46,616	5	49,787	1	40,758			68	57,993	



Age, Service, Salary Information for City of Hartford MERF - All Groups

Attained Age	Completed Years of Credited Service																All years					
	Under 1		1 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 and over		All years	
	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.
Under 25	10	42,205	18	45,389																	28	44,252
25 to 29	25	41,618	79	51,029	29	77,023	5	74,642													138	55,642
30 to 34	12	44,838	91	54,895	114	80,248	31	79,577	1	40,758											249	69,091
35 to 39	11	52,173	59	57,587	87	73,374	86	80,637	32	78,799	3	75,748									278	72,129
40 to 44	9	51,262	34	52,472	67	72,314	83	81,228	64	78,934	24	81,536	6	70,489							287	74,090
45 to 49	15	44,149	47	53,724	42	70,281	80	72,582	57	83,145	49	80,193	11	55,178	2	60,884	1	87,525	1	61,468	305	70,466
50 to 54	9	42,499	36	45,923	42	72,649	57	64,346	67	66,097	45	72,706	14	48,300	8	67,500	1	61,468	4	66,027	283	63,593
55 to 59	3	42,583	15	41,317	26	65,119	50	64,171	34	51,819	31	57,215	16	50,747	7	72,913	3	38,406	1	96,573	186	57,628
60 to 64	8	57,694	20	51,817	20	57,639	33	55,799	31	54,280	18	57,887	10	40,040	13	61,395	6	65,824	2	40,658	161	55,226
65 to 69			6	44,063	9	41,926	9	41,976	15	48,749	7	41,318	7	54,694	2	39,664	1	73,416	2	25,279	58	45,278
70 & over	1	85,818	3	61,798	3	28,693	10	55,218	8	41,073	3	44,053	1	10,998	1	60,105	1	38,320	3	39,176	34	46,975
All ages	103	46,171	408	52,209	439	72,716	444	72,007	309	68,888	180	70,124	65	50,958	33	63,931	13	59,299	13	51,658	2,007	65,143



Section II
Supporting Exhibits
(continued)

G. IRC Section 415(m) Valuation

The IRC Section 415(m) Fund* is an unfunded "excess benefit plan" to provide that portion of certain retirees' pension benefits that exceed the limits permitted under Section 415 of the Federal Internal Revenue Code (IRC).

	<u>July 1, 2017</u>	<u>July 1, 2016</u>
1. Number of retirees and beneficiaries receiving benefits	7	9
2. Annual benefits payable	\$67,000	\$78,000
3. Present value of benefits	\$262,000	\$315,000

The "actives" are funded through MERF. The City provides contributions for the retirees' benefits payable each year, as determined by the Pension Commission.

Actuarial Assumptions

The actuarial assumptions used in the 2017 Section 415(m) Fund valuation are as follows:

Mortality Basis

RP-2014, fully projected (projected to the year of decrement), with separate male & female tables and separate rates for annuitants and non-annuitants, with occupational adjustment. Mortality Improvement is based on the MP-2017 scale.

Mortality Improvement

Projected to date of decrement using Scale MP-2017 (generational mortality).

Termination

N/A.

Salary Scale

N/A.

Investment Return

7.50% per year, net of investment expenses.

Assumed Retirement age

Immediate as all are retired.

Increases in dollar limit on benefits under IRC Section 415

2.75% per year.

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.

Benefits

Retiree pension amounts in excess of IRC Section 415 limits. Benefits which do not exceed such amounts are payable from the City's MERF Plan. IRC Section 415 limits are assumed to increase annually and thus decrease the benefits payable from this Plan and increase the portion of the benefits payable from the City's MERF Plan.

**Section 415(m) Fund adopted by the Court of Common Council on March 24, 1997.*



Section III

Actuarial Cost Methods and Assumptions

A. Actuarial Cost Methods

Asset Valuation Method – Actuarial Value of Assets

In order to smooth the year-to-year fluctuations in asset values, the asset values are adjusted by phasing in recognition of gains and losses over a five-year period. (Phase-in started July 1, 2003). Gains and losses are defined as the difference between the actual and the expected return on assets.

The July 1, 2009 valuation reflected a change in the asset valuation method from the use of a four-year smoothing period for gains and losses to the use of a five-year period. In the year of implementation of the change, the five-year smoothing methodology was retroactively applied to the gains and losses for previous years.

The assets held by the insurance companies include the funds on deposit for future purchase of annuities, as well as the reserves and contingency reserves for annuities already purchased which are subject to experience rating.

Actuarial Funding Method

The “Entry Age Normal Actuarial Cost Method” is used to determine plan liabilities. The Unfunded Actuarial Accrued Liability developed with the July 1, 2016 valuation is amortized over 25 years using a level dollar, closed period. Future gains and losses after July 1, 2016 are amortized over a 15 year level dollar, open period.

Since the MERF fund includes several classifications of members who have different provisions for benefits and contributions, it was necessary to apply this method by separate actuarial valuations for Police, Firefighters, Board of Education, Municipal Services, and Library participants.



Section III Actuarial Cost Methods and Assumptions (continued)

B. Actuarial Assumptions

The actuarial assumptions used in the 2017 MERF valuation are as follows:

Mortality Basis

RP-2014, fully projected (projected to the year of decrement), with separate male & female tables and separate rates for annuitants and non-annuitants, with occupational adjustment. Mortality Improvement is based on the Scale MP-2017 scale.

Prior Valuation: RP-2014, fully projected (projected to the year of decrement), with separate male & female tables and separate rates for annuitants and non-annuitants, with occupational adjustment. Mortality Improvement is based on the Scale MP-2016 scale.

Mortality Improvement

Pre and Post-retirement: Projected to date of decrement using Scale MP-2017 (generational mortality).

Prior: Pre and Post-retirement: Projected to date of decrement using Scale MP-2016 (generational mortality).

We have selected this mortality assumption and mortality improvement scale because it is based on the latest published pension mortality study released by the Society of Actuaries. The mortality assumption was updated to the latest approved table. The change in assumption decreased liabilities by less than 0.5%.

Termination

Police and Fire

Annual rates of termination are illustrated by the sample rates as follows:

Age	Police	Fire
20-24	4.50%	1.00%
25-29	3.25%	1.00%
30-34	2.50%	1.00%
35-39	2.00%	1.00%
40-44	1.25%	0.75%
45-49	0.75%	0.25%
50+	0.00%	0.00%

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Annual rates of termination are illustrated by the sample rates as follows:

Age	Years of Service					
	<1	1	2	3	4	5+
20 -29	30.0%	30.0%	24.0%	22.5%	18.5%	14.5%
30 -39	23.0%	23.0%	18.0%	16.0%	12.5%	8.0%
40 -49	20.0%	20.0%	14.0%	13.0%	9.0%	7.0%
50 -54	18.0%	18.0%	11.0%	10.0%	7.0%	6.0%
55+	13.0%	13.0%	9.5%	8.0%	6.5%	5.5%



Section III

Actuarial Cost Methods and Assumptions

(continued)

Termination (cont.)

Munic. Svc. & Lib.

Annual rates of termination are illustrated as follows:

Age	Years of Service					
	<1	1	2	3	4	5+
20-29	29.00%	27.00%	25.00%	18.00%	15.00%	12.00%
30-39	22.00%	19.00%	16.00%	14.00%	12.00%	7.00%
40-49	16.50%	12.00%	9.00%	8.00%	7.00%	5.50%
50-54	10.00%	8.00%	7.00%	6.00%	5.00%	4.00%
55+	8.00%	7.00%	6.00%	5.00%	4.00%	3.50%

The actuarial assumption in regards to rates of termination shown above is based on the results of an actuarial experience study for the period July 1, 2010 through June 30, 2015.

Investment Return

7.50% per year, net of investment expenses.

This rate is supported by the City's target asset allocation and long term expected rates of return by asset class provided by the investment advisor.

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.



Section III

Actuarial Cost Methods and Assumptions

(continued)

Salary Scale

2.75% for inflationary salary increases plus a percentage for promotion or merit increases as follows.

Yearly Rates of Increases for Promotion or Merit

Age	Police	Fire	Bd of Ed	Munic. Svc. & Lib.
25	5.25%	4.00%	3.50%	5.15%
30	4.35%	2.25%	3.00%	3.85%
35	2.79%	1.75%	2.50%	2.25%
40	1.76%	1.25%	1.50%	2.00%
45	1.35%	0.75%	1.00%	1.65%
50	1.10%	0.50%	0.75%	1.25%
55+	1.00%	0.50%	0.50%	1.00%

Salaries are adjusted for Board of Education groups by 2.75% per year and 0% for City groups for the period of each open contract, for one full fiscal year from the measurement date. Any wage increases negotiated beyond the valuation date have been reflected in our projections.

For Police, final average pay is loaded by a percentage for assumed private duty and overtime as follows: Pre-7/1/1999 hires: 42%; Post 7/1/1999 hires: 19% for employees remaining in the pre 2012 plan; 27% for employees moving to the 7/1/2012 plan.

The salary scale assumptions above are based on the results of an actuarial experience study for the period July 1, 2010 through June 30, 2015.

Assumed Retirement Age

Retirement Rates: Police

Service	Age <50	Age >50	Age >60
20	55.0%	32.5%	100.0%
21-24	30.0%	16.5%	100.0%
25-29	25.0%	12.5%	100.0%
30+	50.0%	50.0%	100.0%

100% retire at age 60, regardless of service; must be age 40 to retire.



Section III Actuarial Cost Methods and Assumptions (continued)

Assumed Retirement Age (cont.)

Retirement Rates: Fire

Age	Years of Service	
	20-24	25-29
45-49	4.0%	7.5%
50-54	10.0%	25.0%
55-59	15.0%	40.0%
60-64	30.0%	50.0%
65+	100.0%	100.0%

100% retire at 30 years of service for all ages.

Retirement Rates: Board of Education

Age	Rate
55	8.0%
56-57	7.0%
58-61	9.0%
62-64	14.0%
65	35.0%
66-74	15.0%
75+	100.0%

Retirement Rates: Municipal Services and Library

Age	<20 yrs svc or over age 65	Service	+20 on yrs svc and under age 65
55	12.0%	20	17.5%
56-59	9.0%	21	20.0%
60-62	12.5%	22	15.0%
63-64	20.0%	23-25	12.5%
65	25.0%	26-27	16.0%
66-74	17.5%	28	17.0%
75	100.0%	29	12.0%
		30	25.0%
		31-34	15.0%
		35	100.0%

The actuarial assumption in regards to rates of retirement shown above is based on the results of an actuarial experience study for the period July 1, 2010 through June 30, 2015.



Section III

Actuarial Cost Methods and Assumptions

(continued)

Social Security

Future tax wage bases are developed by projecting the 2017 base of \$127,200 forward at 4% per year.

Marital Status at Retirement

Non-Uniformed:

Males - 80% married, spouse 3 years younger.

Females - 60% married, spouse same age.

Uniformed: All - 80% married, spouse 2 years younger.

Disability

DP-85 Class 1 Male and Female Disability Incidence Rate Table increased 200% for Firefighter groups, 150% for Police and 10% for all other groups.

DP85 Class 1 Disability Incidence Table: Sample male and female rates

<u>Age</u>	<u>Male</u>	<u>Female</u>
15	0.021%	0.023%
20	0.029%	0.030%
25	0.038%	0.047%
30	0.048%	0.080%
35	0.069%	0.136%
40	0.117%	0.211%
45	0.202%	0.323%
50	0.358%	0.533%
55	0.722%	0.952%
60	1.256%	1.159%
65	1.753%	1.358%

The actuarial assumption in regards to disability rates shown above is based on the results of an actuarial experience study for the period July 1, 2010 through June 30, 2015.

Expenses other than Investment Expenses

An explicit dollar amount was included in the development of the normal cost equal to an estimate of expenses (other than investment expenses) for the upcoming year. The estimate was developed based on an average of actual expenses over the last four years. For the 2017 valuation, \$2,644,058 was used. Estimated expenses were then allocated to the various groups by the actuarial accrued liability.



Section III

Actuarial Cost Methods and Assumptions

(continued)

Sick Exchange

Four years are exchanged by all actives if provision available. For Firefighters hired prior to July 1, 2003, six years are exchanged.

Military and Prior Service

Buy-backs: When a decision to buy-back service occurs, date of hire is adjusted accordingly.

Additional Liabilities

COLAs: Included in this valuation is the liability for the Cost of Living Adjustments (COLAs) effective July 1, 1987, July 1, 1990, July 1, 1997, July 1, 1999, July 1, 2001, July 1, 2005, and July 1, 2007 for both the MERF and the unfunded "Old Plans" (PBF, FRF, and RAF).

Local 566: Included in this valuation is the obligation for Local 566 (included merged Local 1303) members who transferred to State MERF B on August 1, 1988.

30-year amortization payments (split between the City administration and the pension fund) commenced August 1, 1988 for this obligation. As of July 1, 2017, the City payment will be \$303,918 (\$587,000 on a present value basis) and the pension fund payment will be \$276,288 (\$533,000 on a present value basis).



Section IV
Hartford MERF - Summary of Principal Provisions of Pension Plan
July 1, 2017



PROVISIONS FOR:

Retirement Pensions:

POLICE OFFICERS AND FIREFIGHTERS

Firefighters hired before July 1, 2003: 2.80% of Final Average Pay (rate of weekly pay immediately preceding retirement times 52, plus for firefighters who work a 42 hour week, holiday pay) multiplied by years of service up to 25 plus 2.0% for years over 25.

Firefighters hired after June 30, 2003: 2.5% of Final Average Pay (rate of weekly pay immediately preceding retirement times 52, plus for firefighters who work a 42 hour week, holiday pay) multiplied by years of service up to 20 plus 2% of Final Average Pay for years of service over 20. Firefighters hired after December 2016: 2.0% of Final Average Pay (average of highest 2 of last 5 years of base pay plus holiday pay) multiplied by years of service up to 35.

Sworn Police Officers hired before July 1, 1999: 2.65% of Final Average Pay for highest 3 of last 5 years multiplied by years of service up to 20 plus 3% for year 21 plus a decreasing percentage for years over 21. Final Average Pay includes a provision for over-time and private duty pay.

Sworn Police Officers hired after June 30, 1999 not opting into 2013 plan: 2.5% of Final Average Pay for highest 3 of last 5 years times years of service up to 20 plus 2% for years of service- over 20. Final Average Pay includes a provision for over-time and private duty pay.

Sworn Police Officers hired after July 1, 2012 and officers hired after June 30, 1999 opting into new Plan: 2.8% of final rate of pay times years of service up to 25 years plus 2.5% for years of service over 25. Final Average Pay includes a provision for over-time.

BOARD OF EDUCATION MEMBERS

2% (2.5% for HFSHP, HSSSA and HESP) of Final Average Pay for highest 5 of last 10 years times years of service, with maximum benefit of 70% of Final Average Pay. Final Average Pay for HFSHP, HESP, HSSSA, and Local 2221, Hartford Federation of Paraprofessionals are based on highest 3 out of last 5 years. Benefit for Local 2221 is 2.5% of Final Average Pay multiplied by years of service up to 20 plus 2% of Final Average Pay for years of service over 20 (maximum of 10 years).

Effective July 1, 2008 for Local 818, employees hired prior to March 1, 2007 will get 2.5% of Final Average Pay (for each year of service) and employees hired after March 1, 2007 will get 2.0%. Final Average Pay is the highest 3 of the 7 years. Maximum benefit is 70% of pay.

Nonunion employees hired after September 30, 2010 no longer participate in the MERF.

MUNICIPAL SERVICES & LIBRARY MEMBERS

For Library and MLA hired on or after July 1, 2006, HMEA hired after July 1, 2003, CHPEA hired after June 23, 2003, 2% of Final Average Pay for highest 2 of last 5 years times years of service with a maximum benefit of 70% of Final Average Pay. For Library with 5-year option, Final Average Pay is highest 5 of last 10 years.

For CHPEA hired on or before June 23, 2003, MLA hired before July 1, 2006, and Non-bargaining, 2.5% of Final Average Pay for highest 2 of last 5 years times years of service. Maximum benefit of 70% of Final Average Pay for CHPEA, 80% for Non-bargaining and MLA. For Non-bargaining with 5-year option, Final Average Pay is highest 5 of last 10 years.

For Non-bargaining municipal employees hired after January 1, 2011, MLA employees hired after November 26, 2013, HMEA hired after May 21, 2017 and CHPEA hired after December 2017, retirement benefit multiplier is reduced to 1.75%.

For HMEA hired before July 1, 2003, 2.75% of Final Average Pay for highest 2 of last 5 years times years of service with a maximum benefit of 75% (was 70%) of Final Average Pay.

For SCGA, 2% of Final Average Pay for highest 5 of last 10 years reduced by 1% of average Social Security covered earnings for all years included in computation of Social Security primary benefits. Maximum benefit of 100% of Final Average Pay.



PROVISIONS FOR:

POLICE OFFICERS AND FIREFIGHTERS

BOARD OF EDUCATION MEMBERS

MUNICIPAL SERVICES & LIBRARY MEMBERS

Retirement Pensions:

Non-Sworn Police Officers: 2.5% of Final Average Pay for highest 3 of last 5 years times years of service, with maximum benefit of 80% of Final Average Pay.

Non-Sworn Police Officers hired after December 11, 2017: 1.5% of Final Average Pay for Highest 3 of last 5 years times years of service, with maximum benefit of 70 % of Final Average Pay.

Sworn Police Officers have a maximum benefit of 70% of Final Average Pay. For Sworn Police Officers hired before July 1, 1999 and after July 1, 2012 or hired between July 1, 1999 and June 30, 2012 opting into 2012 plan, increase maximum benefit to 80% of Final Average Pay with sick exchange provision for pre July 1, 1999 hires only. Firefighters have a maximum benefit of 80% of Final Average Pay (85% with sick exchange if hired prior to July 1, 2003, 70% if hired after December 2016).

Sworn Police Officers hired after December 11, 2017 have a maximum benefit of 70% of base pay with a 2% multiplier.

Assistant Police Chief, Police Chief, Assistant Fire Chief and Fire Chief: Same as Non-Bargaining.

Normal Form of Benefit:

For unmarried members: life annuity.
For married members: surviving spouse benefit of 25% of member's final year's earnings, if non-service connected death, and 50% of member's final year's earnings, if service connected death. Minimum of 50% of pension benefit for firefighters for non-service connected death.

For married Non-Sworn Police Officers: life annuity with 50% to survivor.

For unmarried members: life annuity.
For married members: life annuity with 50% to survivor.

For unmarried members: life annuity.
For married members: life annuity with 50% to survivor.



PROVISIONS FOR:

**Normal Retirement Age
and Service Requirement:**

POLICE OFFICERS AND FIREFIGHTERS

Firefighters and Sworn Police Officers hired before July 1, 1999: Full benefits after 20 years of continuous service.

Sworn Police Officers hired after June 30, 1999: Full benefits after 25 years of continuous service.

Sworn Police Officers hired after June 30, 2012, full benefits after 25 years of continuous service and age 55.

Non-Sworn Police Officers: Full benefits after 20 years of service, or age 60 plus 5 years of continuous service, or after 15 years of service, if contributions are left in the MERF until would have had 20 years of service.

Non-Sworn Police Officers hired after December 11, 2017, full benefits after 25 years of continuous service and age 62.

Post-2012 Sworn Police Officers who elected one-time option to lower age of retirement to 53 with additional 1% increase in contribution or lower age of retirement to 51 with additional 2.5% increase in contribution.

BOARD OF EDUCATION MEMBERS

Age 60 plus 10 (5 for non-bargaining – was 10) years of service (continuous service for Local 2221). Members are also eligible at age 55 with 25 years of service. Local 818 employees hired prior to March 1, 2007 may retire after 20 years of service, regardless of age. For HSSSA, age 55 and 5 (was 10) years of service.

MUNICIPAL SERVICES & LIBRARY MEMBERS

For SCGA and MLA hired on or after July 1, 2006, earlier of (1) age 60 plus 5 years of continuous service or (2) age 55 with 25 years of continuous service.

For Non-bargaining and MLA hired prior to July 1, 2006, earlier of (1) age 60 plus 5 years of continuous service or (2) 20 years of service, or (3) after 20 years of service if participant leaves after 15 years of service and contributions are left in the MERF until would have had 20 years of service.

For CHPEA, earlier of (1) age 60 plus 5 years of continuous service or (2) 20 years of aggregate service if hired on or before June 23, 2003, age 55 with 25 years of aggregate service if hired after June 23, 2003.

For those hired after the approval of the 2016-2020 agreement, age 65 with 5 years of service.

For HMEA earlier of (1) age 60 plus 5 years of continuous service or (2) 20 years of continuous service if hired before July 1, 2003, age 55 with 25 years of continuous service if hired after July 1, 2003. For employees hired on or after May 21, 2017, age 55 and 25 years of service or age 62 and 5 years of continuous service.

For Library non-union, earlier of (1) age 60 plus 5 years of continuous service or (2) 25 years of continuous service.

For Library union, (1) age 60 plus 10 years of continuous service or (2) 25 years of continuous service.

For Non-bargaining municipal employees hired after January 1, 2011, earlier of age 55 with 20 years of service and age 62 with 5 years of service.



PROVISIONS FOR:

POLICE OFFICERS AND FIREFIGHTERS

BOARD OF EDUCATION MEMBERS

MUNICIPAL SERVICES & LIBRARY MEMBERS

Optional Early Retirement:

Sworn Police Officers: Age 50 with 10 years of continuous service, actuarially reduced for years prior to Normal Retirement Age. Non-Sworn Police Officers: If hired before December 11, 2017: Age 55 with 5 years of continuous service, reduced at 4% per whole year prior to age 60.

Firefighters: Age 50 with 5 years of continuous service, actuarially reduced or reduced at 2% per year (prorated for fractional years) prior to Normal Retirement Age.

At age 55 with 10 years (5 years for HESP) of service (continuous service for Local 2221), reduced at 4% per whole year prior to age 60. For Local 818, reduction is adjusted for partial years.

For Library union, age 55 with 10 years of continuous service. For all others, age 55 with 5 years of continuous service. Benefit reduced at 4% per whole year prior to age 60 (prorate for partial years for HMEA and CHPEA). For HMEA employees hired on or after May 21, 2017, the benefit is reduced a 4% for year year prior to age 62. For SCG members, reduction is 2% per whole year and fraction of a year prior to age 60. For CHPEA employees hired on or after the approval of the 2016-2020 agreement, Age 55 with 15 years of service, reduced at 6% per year.

For Non-bargaining municipal employees hired after January 1, 2011, early retirement reduction is 4% per year prior to age 62.

Vesting of Earned Deferred Pension:

Sworn Police Officers: After 10 years of continuous service.

Firefighters and Non-Sworn Police Officers: After 5 years of continuous service.

After 10 years (5 years for HESP, HSSSA and non-bargaining) of continuous service. Payments begin no earlier than age 55. (Was 10 years for HSSSA and non-bargaining).

For Library union, 10 years of continuous service. For all others, 5 years of continuous service. Payments begin no earlier than age 55.

**Benefits to Survivors:
(Death of Active Member
Prior to Retirement)**

Surviving Spouse: 25% of final year's earnings (50% if service connected death), payable until death or remarriage. Minimum of 50% of pension benefit for Firefighters for non-service connected death. Surviving Child: \$100 per month for first child, \$50 for each additional child (10% of final year's earnings if service connected death, or 15% if no surviving spouse). Total benefit, including Worker's Compensation, cannot exceed 100% of current pay rate for Member's rank. Non-Sworn Police Officers: Same as General Government members.

Member must meet qualifications for vesting. Surviving Spouse: 50% of pension which Member is receiving or would be entitled to when retired, payments beginning no earlier than date of Member's 55th birthday. Surviving Spouse benefits are payable until death or remarriage.



PROVISIONS FOR:

POLICE OFFICERS AND FIREFIGHTERS

BOARD OF EDUCATION MEMBERS

MUNICIPAL SERVICES & LIBRARY MEMBERS

Refund of Contributions upon Discontinuance of Employment or at Death (Non-Vested Members): (May be taken in lieu of earned deferred pension by vested members)

Refund of total contributions, without interest.
Non-Sworn Police Officers: Same as General Government members.

Termination: Refund of total contributions, with 3% interest compounded annually.
Death: Refund of total contributions with interest preretirement and without interest postretirement.

Pensions for Permanent, Total Disability - Service Requirements:

5 years of continuous service, but no requirement if disability is service connected as defined in Worker's Compensation Act.

10 years of continuous service, except no requirement if disability is service connected as defined in Worker's Compensation Act.

Non-Sworn Police Officers: Same as General Government members.

Amount of Total Disability Pension: (Payable as long as total disability continues.)

Retirement Pension with minimum of 25% of "final average pay." If disability is service connected, the pension equals 100% of the Member's final annual pay less Worker's Compensation benefits.

Retirement Pension using Final Average Pay for last 10 years. If disability is service connected, amount not less than 50% of Member's final annual pay at time of disability. Maximum benefit of 2/3 of 10-year Final Average Pay less Social Security benefit. Minimum benefit of \$30 per month. All service connected disability benefits are offset by benefits payable by Worker's Compensation (exception: no offset for \$30 minimum).

Non-Sworn Police Officers: Same as General Government members.

If non service connected, same as above, but no 50% Final Average Pay minimum and minimum benefit equals \$10 per month instead of \$30 per month.

Pensions for Permanent Partial Disability: (Where earnings capacity is reduced by at least 10%.)

Ten years of continuous service, but no service requirement if disability is service connected. Same as retirement pension with reduction for less than 15 years of service. If non-service connected, retirement pension, subject to a minimum equal to 25% of Final Average Pay. This minimum is reduced by earnings if less than 15 years of service at time of disability. If service connected, pension equals 50% of final annual pay (regular 20 year pension for Firefighters) if 15 years of service, with reductions for earnings if less than 15 years of service. If at least 20 years of service, pension equals retirement pension.

10 years of continuous service, except no requirement if disability is service connected as defined in Worker's Compensation Act. Retirement Pension using Final Average Pay for last 10 years (with offset for Worker's Compensation benefits if service-related disability), subject to a minimum pension of \$10 monthly (non-service connected), or \$30 (service connected). If the disability is service connected, benefit not less than 50% of the reduction in earnings with offset for Worker's Compensation benefits. For service connected disability, the maximum benefit is 2/3 of 10 year final average pay less Worker's Compensation and Social Security benefits. For non-service connected disability, the maximum is 2/3 of 10 year final average pay less Social Security benefits, or 1-2/3% of the reduction in income times years of service.

Non-Sworn Police Officers: Same as General Government members.



PROVISIONS FOR:

**Member's Contribution
Rate of Total Earnings:**
**(City pays full balance of
costs to fund MERF
benefits; also Members
and City pay taxes for
those covered by Social
Security.)**

POLICE OFFICERS AND FIREFIGHTERS

Firefighters and Sworn Police Officers hired before July 1, 1999: 8%.

Sworn Police Officers hired after June 30, 1999: 6.5%. If opt into 2012 plan, rate increases to 8.0%

Sworn Police Officers hired after June 30, 2012, 9.5%

Non-Sworn Police Officers: 4% on earnings taxed for Social Security and 7% on excess.

Sworn and Non-Sworn Police Officers hired prior to July 1, 2012 had the option to elect retiree health insurance. If such election was made, the employee contribution rate increases by 1.5%.

Assistant Police Chief, Police Chief, Assistant Fire Chief and Fire Chief: Same as Non-Bargaining.

Effective the pay period after the approval of the 2016-2020 Agreement, all Firefighters contribute 11% of gross wages.

Effective the pay period after the approval of the 2016-2022 agreement, all Police contribute additional 3% of gross wages

Sworn & Non-Sworn Police Officers hired after the approval of the 2016 - 2022 agreement contribute 11% of gross wages.

BOARD OF EDUCATION MEMBERS

4% on earnings taxed for Social Security and 7% on excess. For HESP, 9% and 12%, respectively. For HSSSA, 9.25% and 12.25%, respectively (was 8.75%/11.75%). For HFSHP 10.14% and 13.14%, respectively. For Non-bargaining 4.5% and 7.5%, respectively (was 4%/7%).

For Local 818, 5.2% up to Social Security Wage Base and 8.2% of the excess. If hired on or after March 1, 2007, 7.1% and 10.1%, respectively.

MUNICIPAL SERVICES & LIBRARY MEMBERS

For Non-bargaining, 6.5% on earnings taxed by Social Security and 9.5% on excess if 5 year Final Average Pay option elected (was 5%/8%). With 2 year option, 7.5% and 10.5%, respectively (was 6%/9%).

For Library, 4% on earnings taxed by Social Security and 7% on excess if 5 year Final Average Pay option elected. With 2 year option, 5% and 8%, respectively.

For MLA, HMEA hired after July 1, 2003, and CHPEA hired after June 30, 2003, 5% on earnings taxed by Social Security and 8% on excess. For CHPEA hired on or before June 30, 2003, 6.5% and 9.5%, respectively. CHPEA contributions increase 1.0% effective July 1, 2017, an additional 0.5% effective July 1, 2018, and an additional 1.0% July 1, 2019.

CHPEA employees hired after the approval of the 2016 - 2020 agreement contribute 7.5% on earnings taxed by Social Security and 10.5% on excess. Increase an additional 0.5% on July 1, 2018. For HMEA hired before July 1, 2003, 7.8% on all earnings. Effective the first pay check after May 21, 2017, all HMEA members' contributions increase 1%. New hires after May 21, 2017 contribute 7.5% on social security earnings and 10.5% on excess earnings.

For SCGA, 4% on earnings taxed by Social Security and 7% on excess (was 3%/6%).



Note 1 Any Member (other than a Police Officer or Firefighter) who was a Member before January 1, 1958 is guaranteed a minimum total benefit, including Social Security based on earnings from the City, equal to the pension the Member would have received under the terms of the MERF plan in existence prior to the enactment of the 1957 Special Act No. 347. Also, several active Members who transferred to MERF on or after July 1, 1968 from the City's Retirement Allowance Fund are entitled to a pension determined by the RAF provisions if it is greater than that based on the MERF provisions.

Note 2 Section 2-166 of the Municipal Code provides a minimum benefit of \$155 monthly for all pensions granted by reason of service or for service-connected disability, and for joint annuitants under elected options, except members for whom Social Security taxes have been paid and anyone for whom more than half of the total pension is paid by the Metropolitan District.

Note 3 All members (other than SCG) may purchase up to 4 years of pension credit for military service. Pension credit is at the following rates of Final Average Pay per year purchased:

HMEA members hired before July 1, 2003	2.75%
Sworn Police Officers, Firefighters, CHPEA members hired on or before June 23, 2003, HFSHP, Local 818 hired prior to March 1, 2007, HSSSA, HESP, Non-bargaining (including Assistant Police Chief, Police Chief, Assistant Fire Chief, and Fire Chief), Non-Sworn Police Officers, and MLA hired prior to July 1, 2006	2.50%
Other (including CHPEA members hired after June 23, 2003, HMEA members hired prior to July 1, 2003, MLA hired on or after July 1, 2006, and Local 818 hired on or after March 1, 2007)	2.00%

Note 4 All members (other than Sworn Police Officers hired after July 1, 1999, all Board of Education members, CHPEA hired after June 23, 2003, HMEA hired on or after July 1, 2003, Library, SCG and MLA hired on or after July 1, 2006, Non-bargaining municipal members hired after January 1, 2011) may exchange accumulated sick leave upon retirement for up to 4 years (6 years for Firefighters hired prior to July 1, 2003) of pension service time. Additional pension service time may be purchased from accumulated sick leave at the rate of twenty days of accumulated sick leave for each year of pension service time.