

***CITY OF HARTFORD***  
**MUNICIPAL EMPLOYEES' RETIREMENT FUND (MERF)**

**Actuarial Valuation as of July 1, 2016**





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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 2017-2018 Fiscal Year

The City's recommended contribution for the 2017-2018 fiscal year, determined from the July 1, 2016 actuarial valuation, is shown below. We have shown the recommended contribution for the 2017-2018 fiscal year as a percentage of payroll, as well as an *estimated* dollar amount. Also shown are last year's figures for comparison.

	<b>Recommended 2017-2018 Fiscal Year Net Contribution (July 1, 2016 Valuation)</b>		<b>Recommended 2016-2017 Fiscal Year Net Contribution (July 1, 2015 Valuation)</b>	
	% of payroll	\$ in millions (est.)	% of payroll	\$ in millions (est.)
Police	42.23%	\$16.80	39.08%	\$15.92
Firefighters	35.49%	\$10.87	30.58%	\$9.97
Board of Education	9.50%	\$4.37	8.01%	\$3.91
Municipal Services	47.23%	\$11.42	38.61%	\$10.23
Library	22.94%	<u>\$0.91</u>	18.58%	<u>\$0.82</u>
<b>Total</b>		<b><u>\$44.37</u></b>		<b><u>\$40.85</u></b>

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.

The dollar amount shown above is an *estimate* of the cash contribution required. So, while the percentages of payroll will not change because they are set by the valuation, the dollar amount of the City's actual contribution will change -- upward or downward -- depending on whether *actual* payrolls in the fiscal year are more, or less, than currently estimated.



## Section I

### Valuation Report

(continued)

#### C. Funded Status

The funded status of the plan as of July 1, 2016 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.

	<b>July 1, 2016</b>
Actuarial Accrued Liability	\$1,425,378,000
Actuarial Value of Assets	<u>1,066,750,000</u>
Unfunded Status	358,628,000
Funded Percentage	74.8%

During the 2015-2016 fiscal year, the plan's funded status decreased from 77.6% as of July 1, 2015 to 74.8% as of July 1, 2016, as detailed above. This was mostly due to continued recognition of asset losses and the change in investment return assumption from 7.75% to 7.50%.

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 74.8% 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.



## Section I

### Valuation Report

(continued)

#### D. Plan Experience During Period Under Review

The recommended City contribution for the 2017-2018 fiscal year has increased from last year by approximately \$3.5 million based on estimates of payroll. This increase is the net impact of annual plan asset, liability experience, and assumption and method changes.

The July 1, 2015 Valuation produced a net City contribution of \$40.9 million for the 2016-2017 fiscal year. Based on July 1, 2016 participant data and assets, the 2017-2018 net City contribution is \$44.4 million.

During 2015-2016, the market value of assets decreased from \$1,038.19 million to \$999.6 million, resulting in an asset return of approximately 0.9% 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, 2016, the actuarial value of assets used in the development of the contribution requirement was approximately \$1,066.7 million, \$67.1 million higher than the market value of assets of \$999.6 million at such date. The return for the year on the actuarial value was 5.2%. Since 5.2% is less than the MERF’s 7.75% return assumption for the 2015-2016 plan year, asset losses were generated that increased the fiscal year 2017-2018 contribution requirement. Specifically, these losses represented approximately a \$3.1 million increase in contribution.

Changes in the plan’s population and the resulting impact on plan liabilities had the net effect of decreasing the recommended City contribution by approximately \$0.1 million. While actual experience is reviewed each year and compared to expected, a full experience study was computed for the period 2010-2015. Assumptions have been updated to reflect actual experience. The net impact of these assumption changes (other than the investment return assumption) was a decrease in contribution of \$1.1 million.

In conjunction with the reduced inflation assumption (3.0% to 2.75%), the investment return assumption was also reduced by 25 basis points, from 7.75% to 7.50%. The unfunded liability as of July 1, 2016 will be amortized over a closed 25 year period and the mortality assumption phase in was removed. The net impact of the investment return assumption change and method changes was an increase in contribution of \$3.2 million.

Finally plan changes in the Fire group decreased the contribution by \$1.6 million.



## Section I

### Valuation Report

(continued)

#### E. Changes Since The Last Valuation

As a result of an Experience Study that was conducted for the period July 1, 2010 through June 30, 2015, several changes were made to the actuarial assumptions. See the Experience Study report for details.

The investment return assumption was changed from 7.75% to 7.50%.

The amortization period for the Unfunded Actuarial Accrued Liability as of July 1, 2016 was set to a 25-year level dollar closed period. Future gains and losses after July 1, 2016 will continue to be amortized over a 15-year level dollar open period.

#### 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, 2016, there were approximately \$67.1 million in net unrecognized asset losses that eventually will be recognized in future City contribution requirements because of the use of this smoothing method. Due to these outstanding losses the City's contribution is expected to increase for the 2018-2019 fiscal year, absent other significant changes.

To provide a sense of the level of expected future contributions, an estimate for the 2018-2019 fiscal year has been calculated. Specifically, the City's net estimated recommended contribution for that fiscal year is currently **\$46.9 million**. This figure is based on a projected market value of assets at July 1, 2017 of \$1,015.9 million, determined by projecting the market value of assets as of July 1, 2016 to June 30, 2017 assuming a 7.50% return. Projected plan liabilities inherent in this calculation were based on the results of the July 1, 2016 valuation, including the assumptions, methods, and census data as of such date.

The projected asset value and estimated contribution for the 2018-2019 fiscal year assume the City funds the recommended contribution for 2016-2017. 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 2018-2019 recommended contribution will be based upon final liabilities, assets, and the investment return and other actuarial assumptions used in the July 1, 2017 Actuarial Valuation.



## Section I

### Valuation Report

(continued)

#### G. Certification

This report presents the results of the July 1, 2016 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, 2018. 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.

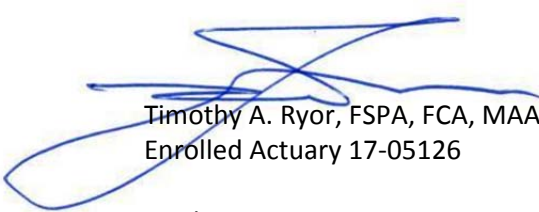
We certify that the actuarial assumptions and methods that were selected by us and represent our best estimate of anticipated actuarial experience under the Plan.

In preparing this valuation, we have relied on employee data and asset and contribution information provided by the Plan Sponsor. We have audited neither the employee data nor the financial information, although we 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.

We are members of the American Academy of Actuaries and meet its Qualification Standards to render the actuarial opinion contained herein.



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April 25, 2017



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## Section II

### Supporting Exhibits

#### A. Entry Age Normal Actuarial Accrued Liability as of July 1, 2016

	Police	Firefighters	Board Of Education	Municipal Services	Library	Total Membership
A. Covered Payroll						
Annual Payroll (000)	\$38,824	\$29,905	\$48,002	\$23,538	\$3,852	\$144,121
B. Actuarial Accrued Liability (AAL)						
Entry Age Normal AAL (000)						
1. Active Members						
a. Active Members' MERF Liability	\$115,505	\$90,076	\$86,228	\$52,937	\$8,678	\$353,424
b. Local 566 Payment Present Value	0	0	1,622	0	0	
c. Local 1716 Payment Present Value	0	0	0	0	0	
d. Total for Active Members	115,505	90,076	87,850	52,937	8,678	355,046
2. Terminated Non-Vested Members [allocated by (1d)]	425	331	317	195	32	1,300
3. Terminated Vested Members	1,635	1,293	11,017	10,031	304	24,280
4. Retired Members	357,715	289,941	106,333	272,492	17,852	1,044,333
5. Old Plans Cola 1987/1990/1997/1999/2001/2005/2007	226	141	43	8	0	418
6. Total	475,506	381,783	205,560	335,663	26,866	1,425,378
C. Valuation Assets (Adjusted Value)						
1. Amount prior to Recognizing Receivable (000)	\$349,416	\$286,878	\$172,747	\$237,626	\$20,084	\$1,066,750
2. Contribution Receivable (000)	0	0	0	0	0	0
3. Valuation Assets after Recognition of Receivable (000)	349,416	286,878	172,747	237,626	20,084	1,066,750
D. Unfunded Actuarial Accrued Liability (000)	\$126,090	\$94,905	\$32,813	\$98,037	\$6,782	\$358,628
E. Funded Percent (C. / B.)	73.5%	75.1%	84.0%	70.8%	74.8%	74.8%





## Section II

### Supporting Exhibits

(continued)

#### B. Cash Contributions

#### July 1, 2017 – June 30, 2018 Fiscal Year Contribution

	Police	Firefighters	Board Of Education	Municipal Services	Library	Total Membership
1. Development of Amortization						
a. Unfunded Actuarial Accrued Liability	\$126,089,831	\$94,905,534	\$32,813,390	\$98,037,034	\$6,782,503	\$358,628,292
b. Amortization of Unfunded AAL (25 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)	0	0	0	0	0	0
d. Total Amortization	10,522,422	7,920,036	2,738,336	8,181,366	566,012	29,928,172
2. Normal Cost Development						
a. Normal Cost Beginning of Year prior to Expense Load	\$4,531,877	\$1,777,080	\$1,313,008	\$2,075,391	\$242,984	\$9,940,340
b. Normal Cost Projected One Year prior to Expense Load	4,871,768	1,910,361	1,411,484	2,231,045	261,208	10,685,866
c. Expense Load (Allocated by AAL)	855,467	686,853	369,816	603,880	48,334	2,564,350
3. Fiscal Year Contribution for 07/01/2017 - 06/30/2018 Before Mortality Assumption Phase-In						
I. Gross City Contribution						
a. Total Contribution Due as of Beginning of Year (1d+2b+2c)	16,249,657	10,517,250	4,519,636	11,016,291	875,554	43,178,388
b. Total Interest Adjusted Gross City Contribution	16,848,003	10,904,517	4,686,058	11,421,934	907,794	44,768,305
II. Annual Adjusted Payroll as of 07/01/2016 w proj	39,891,740	30,727,835	49,322,318	24,185,576	3,957,788	148,085,257
III. Contribution as a % of Payroll prior to adjustments	42.23%	35.49%	9.50%	47.23%	22.94%	30.23%
IV. 07/01/2017 Payment for Local 566 (000)	0	0	303,918	0	0	303,918
V. 07/01/2017 Payment for Local 1716 (000)	0	0	0	0	0	0
VI. Old Plans COLA Annual Payment (000)	50,905	32,004	11,694	2,056	0	96,659
VII. Net City Contribution [(I.) - (IV.) - (V.) - (VI.)]	16,797,098	10,872,513	4,370,446	11,419,878	907,794	44,367,728

	2017 - 2018 Contribution Sensitivity*					
	Police	Firefighters	Board of Education	Municipal Services	Library	Total
Estimated 2017-2018 Fiscal Year Payroll +5%	\$41,886,327	\$32,264,227	\$51,788,434	\$25,394,855	\$4,155,677	\$155,489,520
Net City Contribution Estimate for 2017-2018	17,637,691	11,418,570	4,604,289	11,991,934	953,312	46,605,796
Estimated 2017-2018 Fiscal Year Payroll -5%	37,897,153	29,191,443	46,856,202	22,976,297	3,759,899	140,680,994
Net City Contribution Estimate for 2017-2018	15,953,063	10,328,039	4,135,727	10,849,649	862,521	42,128,999

\*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, 2016	July 1, 2015
<b>Actuarial Liabilities</b>		
Present Value of Future Benefits for:		
Active Employees	\$538,716,685	\$574,053,746
Inactive Members		
• Regular Retirees	946,740,544	866,500,823
• Disability Retirees	75,523,523	65,530,128
• Survivors	22,069,312	23,481,467
• Terminated Non-Vesteds	1,300,000	1,147,476
• Terminated Vesteds	24,279,902	23,061,690
• Old Plans COLA	<u>419,321</u>	<u>516,140</u>
TOTAL	\$1,609,049,287	\$1,554,291,470
<b>Source of Funds</b>		
1. Actuarial Value of Assets	\$1,066,749,972	\$1,060,206,696
2. Present Value of Future Employee Contributions	97,592,435	89,923,326
3. Present Value of Future City Normal Cost Contributions	86,078,588	97,997,871
4. Unfunded Accrued Liability	<u>358,628,292</u>	<u>306,163,577</u>
5. TOTAL = (1) + (2) + (3) + (4)	\$1,609,049,287	\$1,554,291,470



## Section II

### Supporting Exhibits

(continued)

#### D. Value of Accrued Benefits as of July 1, 2016

	Police	Firefighters	Board Of Education	Municipal Services	Library	Total Membership
A. Covered Payroll						
Annual Payroll	\$38,824	\$29,905	\$48,002	\$23,538	\$3,852	\$144,121
B. Actuarial Accrued Liability (AAL)						
Unit Credit AAL						
1. Active Members						
a. Active Members' MERF Liability	\$79,289	\$70,473	\$60,200	\$45,048	\$6,932	\$261,942
b. Local 566 Payment Present Value	0	0	1,622	0	0	1,622
c. Local 1716 Payment Present Value	0	0	0	0	0	0
d. Total for Active Members	79,289	70,473	61,822	45,048	6,932	263,564
2. Terminated Non-Vested Members [allocated by (1d)]	425	331	317	195	32	1,300
3. Terminated Vested Members	1,635	1,293	11,017	10,031	304	24,280
4. Retired Members	357,715	289,941	106,333	272,492	17,852	1,044,333
5. Old Plans Cola 1987/1990/1997/1999/2001/2005/2007	226	141	43	8	0	418
6. Total	439,290	362,179	179,532	327,774	25,120	1,333,895



**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.

<b>Relationship of Actuarial Value to Market Value</b>		
1. Market value 7/1/2016	\$	999,612,429
2. Gain / (loss) not recognized in actuarial value 7/1/2016		(67,137,543)
3. Preliminary actuarial value 7/1/2016: (1)-(2)		1,066,749,972
4. Preliminary actuarial value as a percentage of market value: (3)÷(1)		106.7%
5. Gain / (loss) recognized for corridor min/max		N/A
6. Actuarial value 7/1/2016 after corridor min/max: (3)+(5)		1,066,749,972
7. Actuarial value as a percentage of market value: (6)÷(1)		106.7%

<b>Development of Asset Gain / (Loss) for 2015-2016 Plan Year</b>		
1. Market value 7/1/2015	\$	1,038,194,319
2. Contributions		56,933,079
3. Benefit payments		101,778,027
4. Administrative expenses		2,433,813
5. Expected return at 7.75%		78,667,209
6. Expected value 7/1/2016: (1)+(2)-(3)-(4)+(5)		1,069,582,767
7. Market value 7/1/2016		999,612,429
8. Asset gain / (loss) for -1 Plan Year: (7)-(6)		(69,970,338)

<b>Recognition of Gain / (Loss) in Actuarial Value</b>					
	(a)	(b)	(c)	(d)	(e)
Year	Gain / (loss)	Recognized as of 7/1/2015	Recognized in current year: 20% of (a)	Total recognized as of 7/1/2016: (b)+(c)	Not recognized as of 7/1/2016: (a)-(d)
2011-2012	\$ (58,190,952)	\$ (46,552,760)	\$ (11,638,192)	\$ (58,190,952)	\$ 0
2012-2013	3,810,109	2,286,066	762,022	3,048,088	762,021
2013-2014	59,992,444	23,996,978	11,998,489	35,995,467	23,996,977
2014-2015	(59,867,117)	(11,973,423)	(11,973,423)	(23,946,846)	(35,920,271)
2015-2016	(69,970,338)	0	(13,994,068)	(13,994,068)	(55,976,270)
Total			(24,845,172)		(67,137,543)



## Section II

### Supporting Exhibits

(continued)

#### E. Development of Asset Values

Summary of Fund Activity		
	Market Value	Actuarial Value
<b>1. Beginning value 7/1/2015</b>		
a. Trust assets	\$ 1,038,194,319	\$ 1,060,206,696
b. Accrued contribution	0	0
c. Benefits payable	0	0
d. Administrative expenses payable	0	0
e. Net: (a)+(b)-(c)-(d)	1,038,194,319	1,060,206,696
<b>2. Contributions</b>		
a. Employer contributions during year	43,890,588	43,890,588
b. Employee contributions during year	13,042,491	13,042,491
c. Change in accrued contribution	0	0
d. Total for plan year	56,933,079	56,933,079
<b>3. Disbursements</b>		
a. Benefit payments during year	101,778,027	101,778,027
b. Administrative expenses during year	2,433,813	2,433,813
c. Change in benefits payable	0	0
d. Change in administrative expenses payable	0	0
e. Total for plan year	104,211,840	104,211,840
<b>4. Net investment return</b>		
a. Interest and dividends	17,445,154	N/A
b. Change in accrued income	0	N/A
c. Realized gain (loss)	25,091,532	N/A
d. Unrealized gain (loss)	(27,288,022)	N/A
e. Expected return	N/A	78,667,209
f. Recognized gain (loss)	N/A	(24,845,172)
g. Required adjustment due to corridor	N/A	0
h. Reversal of prior year required adjustment	N/A	0
i. Investment-related expenses	(6,551,793)	N/A
j. Total	8,696,871	53,822,037
<b>5. Ending value 7/1/2016</b>		
a. Trust assets: (1a)+(2a)-(3a)-(3b)+(4j)	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
<b>6. Approximate rate of return 2015-2016</b>	0.9%	5.2%



## 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
2007	15.6%	10.8%	6.6%	8.7%
2008	-1.9%	11.1%	10.4%	8.3%
2009	-15.0%	-1.2%	9.0%	8.3%
2010	11.1%	-2.5%	2.7%	6.3%
2011	17.7%	3.6%	4.7%	3.7%
2012	1.9%	10.0%	2.1%	5.7%
2013	8.4%	9.1%	4.2%	6.2%
2014	14.1%	8.0%	10.5%	6.6%
2015	2.0%	8.1%	8.6%	6.5%
2016	0.9%	5.5%	5.3%	5.0%



## Section II

### Supporting Exhibits

(continued)

#### F. Membership Data

##### Summary – Active Members as of July 1, 2016

	Number	Payroll*	Average Annual Pay*
Police	411	\$38,824,078	\$94,462
Firefighters	293	29,905,435	102,066
Board of Education	995	48,002,256	48,243
Municipal Services	380	23,538,274	61,943
Library	<u>70</u>	<u>3,851,862</u>	<u>55,027</u>
<b>Total</b>	<b>2,149</b>	<b>\$144,121,905</b>	<b>\$67,065</b>

\*Basic salary plus overtime.

##### Summary – Pensioners as of July 1, 2016

	Service Pensions*		Disability Pensions		Survivor Benefits*		Total	
	Count	Total Monthly Annuities	Count	Total Monthly Annuities	Count	Total Monthly Annuities	Count	Total Monthly Annuities
Police	539	\$2,542,727	73	\$158,594	113	\$71,677	725	\$2,772,998
Firefighters	382	1,974,008	122	335,153	132	94,555	636	2,403,716
Board of Ed.	621	973,841	22	12,092	68	15,777	711	1,001,710
Municipal Svcs.	766	2,248,214	9	7,706	108	42,780	883	2,298,700
Library	81	163,969	2	1,867	5	930	88	166,766
Vested Deferred	<u>218</u>	<u>260,163</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>218</u>	<u>260,163</u>
<b>TOTAL**</b>	<b>2,389</b>	<b>\$8,162,922</b>	<b>228</b>	<b>\$515,412</b>	<b>426</b>	<b>\$225,719</b>	<b>3,043</b>	<b>\$8,904,053</b>

\* 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
<b>Total Participants 7/1/2015</b>	<b>446</b>	<b>3</b>	<b>706</b>	<b>1,155</b>
Adjustments	-8	+2	0	-6
Retirements	-28	-2	+30	0
Disabilities	-2	0	+2	0
Terminations				
Vested	-4	+4	N/A	0
Non-vested	-5	N/A	N/A	-5
Deaths	0	0	-18	-18
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>+12</u>	<u>N/A</u>	<u>N/A</u>	<u>+12</u>
<b>Total Participants 7/1/2016</b>	<b>411</b>	<b>7</b>	<b>725</b>	<b>1,143</b>
<b>Average Age</b>				
7/1/2015	39.8			
7/1/2016	40.1			
<b>Average Service</b>				
7/1/2015	11.0			
7/1/2016	11.2			
<b>Payroll**</b>				
7/1/2015	\$38,890,802			
7/1/2016	38,824,078			
<b>Total monthly benefits*</b>				
7/1/2015		\$8,626	\$2,588,893	
7/1/2016		13,879	2,772,998	

\* Excludes old plan COLA participants.





## Section II

### Supporting Exhibits

(continued)

#### F. Membership Data

##### Data Reconciliation – Firefighters

Participant Data				
	Active	Terminated Vested	Pensioners	Total
<b>Total Participants 7/1/2015</b>	<b>341</b>	<b>9</b>	<b>593</b>	<b>943</b>
Adjustments	0	0	0	0
Retirements	-44	-6	+50	0
Disabilities	-4	0	+4	0
Terminations				
Vested	-2	+2	N/A	0
Non-vested	0	N/A	N/A	0
Deaths	0	0	-20	-20
New beneficiaries	N/A	0	+9	+9
Lump Sum Settlements	N/A	-1	0	-1
Transfer group	0	0	0	0
Rehires	0	0	0	0
New entrants	+2	N/A	N/A	+2
<b>Total Participants 7/1/2016</b>	<b>293</b>	<b>4</b>	<b>636</b>	<b>933</b>
<b>Average Age</b>				
7/1/2015	40.8			
7/1/2016	40.1			
<b>Average Service</b>				
7/1/2015	13.2			
7/1/2016	12.3			
<b>Payroll**</b>				
7/1/2015	\$31,355,468			
7/1/2016	29,905,435			
<b>Total monthly benefits*</b>				
7/1/2015		\$47,443	\$2,110,486	
7/1/2016		10,372	2,403,716	

\* 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
<b>Total Participants 7/1/2015</b>	<b>1,096</b>	<b>94</b>	<b>704</b>	<b>1,894</b>
Adjustments	-9	+5	+1	-3
Retirements	-14	-15	+29	0
Disabilities	0	-1	+1	0
Terminations				
Vested	-32	+32	N/A	0
Non-vested	-91	N/A	N/A	-91
Deaths	-1	0	-31	-32
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>+45</u>	<u>N/A</u>	<u>N/A</u>	<u>+45</u>
<b>Total Participants 7/1/2016</b>	<b>995</b>	<b>112</b>	<b>711</b>	<b>1,818</b>
<b>Average Age</b>				
7/1/2015	46.6			
7/1/2016	47.6			
<b>Average Service</b>				
7/1/2015	9.9			
7/1/2016	10.9			
<b>Payroll**</b>				
7/1/2015	\$50,347,161			
7/1/2016	48,002,256			
<b>Total monthly benefits*</b>				
7/1/2015		\$103,442	\$965,455	
7/1/2016		124,065	1,001,710	

\* Excludes old plan COLA participants.



## Section II

### Supporting Exhibits

(continued)

#### F. Membership Data

##### Data Reconciliation – Municipal Services

Participant Data				
	Active	Terminated Vested	Pensioners	Total
<b>Total Participants 7/1/2015</b>	<b>414</b>	<b>62</b>	<b>880</b>	<b>1,356</b>
Adjustments	+1	+5	0	+6
Retirements	-20	-3	+23	0
Disabilities	0	0	0	0
Terminations				
Vested	-25	+25	N/A	0
Non-vested	-27	N/A	N/A	-27
Deaths	-1	-1	-28	-30
New beneficiaries	N/A	0	+8	+8
Lump Sum Settlements	N/A	0	0	0
Transfer group	0	0	0	0
Rehires	0	0	0	0
New entrants	<u>+38</u>	<u>N/A</u>	<u>N/A</u>	<u>+38</u>
<b>Total Participants 7/1/2016</b>	<b>380</b>	<b>88</b>	<b>883</b>	<b>1,351</b>
<b>Average Age</b>				
7/1/2015	49.5			
7/1/2016	48.9			
<b>Average Service</b>				
7/1/2015	11.0			
7/1/2016	11.0			
<b>Payroll**</b>				
7/1/2015	\$26,516,085			
7/1/2016	23,538,274			
<b>Total monthly benefits*</b>				
7/1/2015		\$72,628	\$2,290,485	
7/1/2016		107,361	2,298,700	

\* Excludes old plan COLA participants.



## Section II

### Supporting Exhibits

(continued)

#### F. Membership Data

##### Data Reconciliation – Library

Participant Data				
	Active	Terminated Vested	Pensioners	Total
<b>Total Participants 7/1/2015</b>	<b>73</b>	<b>5</b>	<b>83</b>	<b>161</b>
Adjustments	0	0	+1	+1
Retirements	-6	-1	+7	0
Disabilities	0	0	0	0
Terminations				
Vested	-3	+3	N/A	0
Non-vested	-6	N/A	N/A	-6
Deaths	0	0	-4	-4
New beneficiaries	N/A	0	+1	+1
Lump Sum Settlements	N/A	0	0	0
Transfer group	0	0	0	0
Rehires	0	0	0	0
New entrants	<u>+12</u>	<u>N/A</u>	<u>N/A</u>	<u>+12</u>
<b>Total Participants 7/1/2016</b>	<b>70</b>	<b>7</b>	<b>88</b>	<b>165</b>
<b>Average Age</b>				
7/1/2015	48.0			
7/1/2016	46.2			
<b>Average Service</b>				
7/1/2015	12.7			
7/1/2016	12.3			
<b>Payroll**</b>				
7/1/2015	\$4,195,509			
7/1/2016	3,851,862			
<b>Total monthly benefits*</b>				
7/1/2015		\$5,075	\$156,690	
7/1/2016		4,486	166,766	

\* Excludes old plan COLA participants.



## Section II

### Supporting Exhibits

(continued)

### F. Membership Data

#### Data Reconciliation – Total

Participant Data				
	Active	Terminated Vested	Pensioners	Total
<b>Total Participants 7/1/2015</b>	<b>2,370</b>	<b>173</b>	<b>2,966</b>	<b>5,509</b>
Adjustments	-16	+12	+2	-2
Retirements	-112	-27	+139	0
Disabilities	-6	-1	+7	0
Terminations				
Vested	-66	+66	N/A	0
Non-vested	-129	N/A	N/A	-129
Deaths	-2	-1	-101	-104
New beneficiaries	N/A	0	+30	+30
Lump Sum Settlements	N/A	-3	0	-3
Transfer group	0	0	0	0
Rehires	+1	-1	0	0
New entrants	<u>+109</u>	<u>N/A</u>	<u>N/A</u>	<u>+109</u>
<b>Total Participants 7/1/2016</b>	<b>2,149</b>	<b>218</b>	<b>3,043</b>	<b>5,410</b>
<b>Payroll</b>				
7/1/2015	\$151,305,025			
7/1/2016	144,121,905			
<b>Total monthly benefits*</b>				
7/1/2015		\$237,214	\$8,112,009	
7/1/2016		260,163	8,643,890	

\* 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	8	43,632	4	50,567																	12	45,944
25 to 29	2	43,632	14	62,498	14	90,180	1	93,726													31	74,790
30 to 34	1	43,632	12	63,271	53	95,269	17	99,832	1	86,527											84	90,903
35 to 39			3	62,669	30	96,592	40	107,009	11	97,999	1	90,441									85	100,406
40 to 44	1	43,632	3	70,921	19	87,428	33	102,915	16	108,467	6	107,912									78	98,675
45 to 49			2	67,505	12	93,285	24	104,824	26	106,429	12	110,773	1	120,137							77	103,724
50 to 54			1	112,678	6	89,912	7	86,942	6	110,165	5	106,803	1	111,368	1	114,166					27	99,307
55 to 59			1	68,145	1	74,165	5	94,709	1	95,217	2	79,447	4	78,661							14	84,615
60 to 64									1	94,745	1	75,410			1	64,389					3	78,182
65 to 69																						
70 & over																						
All ages	12	43,632	40	63,828	135	93,361	127	102,876	62	105,131	27	105,019	6	91,025	2	89,278					411	94,462



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

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			1	66,407																		1	66,407
25 to 29			23	66,772	24	85,935																47	76,557
30 to 34			12	67,348	29	88,167	1	92,100														42	82,312
35 to 39			11	67,811	25	87,428	9	96,579	10	89,274												55	85,338
40 to 44			2	67,818	15	84,545	7	92,969	23	90,906	14	96,740	1	83,781								62	90,058
45 to 49			1	69,147	2	89,352	5	93,183	14	96,664	16	100,127	1	124,154			1	100,687				40	97,348
50 to 54			1	66,407	2	85,502	3	96,566	9	89,663	15	102,587	3	109,042	2	94,332						35	96,819
55 to 59					1	92,100	1	79,889	5	86,535	3	101,464					1	101,442				11	91,863
60 to 64																							
65 to 69																							
70 & over																							
All ages			51	67,205	98	86,887	26	94,138	61	91,418	48	99,991	5	107,012	2	94,332	2	101,064				293	87,686



**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	2	47,227	14	34,626																	16	36,201
25 to 29	9	38,454	52	38,047	3	55,127															64	38,905
30 to 34	5	45,423	48	43,323	16	40,493	12	38,197	1	33,633											82	42,030
35 to 39	3	58,629	30	45,053	41	50,027	25	44,118	11	38,050											110	46,331
40 to 44	9	51,488	29	44,165	27	54,554	24	64,124	25	44,291	5	47,423									119	51,265
45 to 49	7	37,616	45	43,857	22	58,013	25	40,700	35	54,699	14	47,913	6	41,859			1	84,247			155	48,073
50 to 54	4	35,034	29	41,239	26	55,591	25	54,277	41	51,097	14	49,948	13	52,088	1	55,808	1	29,669			154	49,969
55 to 59	1	50,995	15	44,350	25	50,299	23	50,136	26	38,483	17	43,836	8	56,780	4	52,454	2	54,234	1	91,124	122	47,018
60 to 64			14	34,888	10	51,908	20	47,283	24	44,345	16	52,316	7	40,066	6	59,813	3	48,851	2	38,448	102	46,248
65 to 69			6	41,971	9	51,412	12	43,167	9	51,922	5	54,245	7	52,343	2	62,696	1	36,236	3	39,627	54	48,481
70 & over			1	29,669	2	25,427	5	44,683	4	38,153	3	56,745	1	40,647					1	34,796	17	41,308
All ages	40	44,035	283	41,625	181	51,662	171	48,625	176	46,896	74	49,066	42	49,287	13	57,684	8	50,647	7	45,957	995	46,868





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

**Completed Years of Credited Service**

Attained Age	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			9	28,778																	9	28,778
25 to 29	4	54,136	14	51,288	2	36,929															20	50,422
30 to 34	6	69,500	19	56,438	8	62,455	3	70,760													36	61,019
35 to 39	4	65,573	12	74,364	10	64,919	6	64,728	4	64,528	1	68,650									37	68,080
40 to 44	3	59,639	8	70,270	11	80,650	12	66,651	3	86,224			2	80,923							39	73,040
45 to 49	1	78,222	5	79,023	10	67,698	13	79,949	7	62,267	2	64,870	3	88,016			2	56,696			43	72,854
50 to 54	4	49,901	11	69,274	11	72,147	12	58,369	5	17,787	7	51,633	5	36,135	1	65,226	1	68,650	6	61,503	63	56,978
55 to 59	1	15,000	8	61,185	9	67,862	17	69,967	9	51,652	5	86,807	2	64,798	2	78,636	1	9,994			54	64,823
60 to 64	2	105,000	5	74,192	11	83,710	10	72,287	11	51,427	4	56,464	3	39,539	4	70,255					50	68,316
65 to 69	1	15,000	4	68,043	1	83,695	4	45,402	3	32,685	1	11,048					1	68,994	1	7,608	16	46,136
70 & over	2	67,169	2	35,565	1	15,000	4	28,250	1	11,048	2	10,998	1	11,048							13	29,043
All ages	28	61,676	97	60,420	74	70,415	81	66,014	43	50,727	22	56,943	16	54,115	7	71,931	5	52,206	7	53,804	380	62,066



**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		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	2	42,411																			2	42,411
25 to 29	2	41,326	4	44,421																	6	43,390
30 to 34	2	55,778	2	65,421			1	43,975	1	40,758											6	54,522
35 to 39	1	70,799	5	68,083	1	56,427	2	43,975	1	43,975	1	46,613									11	57,810
40 to 44					1	41,437			1	46,724	1	40,758									3	42,973
45 to 49	2	116,638	1	56,427			4	54,284			1	43,975	3	50,087	1	48,504					12	62,465
50 to 54	2	43,797	3	78,657			2	58,999	2	87,289	2	54,459	3	42,903							14	60,983
55 to 59					3	65,920	2	44,328					1	44,814	2	52,824					8	54,610
60 to 64							1	42,679							1	50,784					2	46,731
65 to 69	1	60,024			1	52,195	1	40,758					2	72,567			1	40,758			6	56,478
70 & over																						
All ages	12	60,894	15	62,375	6	57,970	13	49,166	5	61,207	5	48,053	9	52,102	4	51,234	1	40,758			70	55,824



**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	12	44,028	28	36,159																	40	38,519
25 to 29	17	43,091	107	49,392	43	82,888	1	93,726													168	57,592
30 to 34	14	57,093	93	52,197	106	82,581	34	73,643	3	53,639											250	68,224
35 to 39	8	63,623	61	57,503	107	73,492	82	82,059	37	72,740	3	68,568									298	72,214
40 to 44	13	52,765	42	52,175	73	73,026	76	84,023	68	77,044	26	87,681	3	81,876							301	74,280
45 to 49	10	57,481	54	48,690	46	70,682	71	74,023	82	78,912	45	83,907	14	64,982	1	48,504	4	74,582			327	70,992
50 to 54	10	42,733	45	52,733	45	65,544	49	62,728	63	60,737	43	75,406	25	57,001	5	84,773	2	49,159	6	61,503	293	62,145
55 to 59	2	32,997	24	50,953	39	57,237	48	62,180	41	48,617	27	60,835	15	62,886	8	59,092	4	54,976	1	91,124	209	56,788
60 to 64	2	105,000	19	45,231	21	68,566	31	55,200	36	47,909	21	54,206	10	39,908	12	62,922	3	48,851	2	38,448	157	53,893
65 to 69	2	37,512	10	52,400	11	54,418	17	43,551	12	47,113	6	47,045	9	56,837	2	62,696	3	48,663	4	31,623	76	48,619
70 & over	2	67,169	3	33,600	3	21,951	9	37,380	5	32,732	5	38,446	2	25,847					1	34,796	30	35,993
All ages	92	51,550	486	50,524	494	72,974	418	71,326	347	65,809	176	72,494	78	57,513	28	65,199	16	56,818	14	49,880	2,149	64,526



**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, 2016</u>	<u>July 1, 2015</u>
1. Number of retirees and beneficiaries receiving benefits	9	9
2. Annual benefits payable	\$78,000	\$79,000
3. Present value of benefits	\$315,000	\$299,000

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 2016 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-2016 scale.

**Mortality Improvement**

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

**Termination**

N/A.

**Salary Scale**

N/A.

**Investment Return**

7.50% per year, net of investment expenses. (Prior Valuation: 7.75%.)

**Assumed Retirement age**

Immediate as all are retired.

**Increases in dollar limit on benefits under IRC Section 415**

2.75% per year. (Prior Valuation: 3.0%.)

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. (Prior: 25 years level dollar closed as of July 1, 2013.)

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 2016 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 MP-2016 scale.

##### Mortality Improvement

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.

##### 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%

###### Bd of Ed

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:

	Years of Service					
Age	<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.\*

\* The following groups have future salary increases that have been negotiated and are reflected in this valuation:

- Firefighters
- Police
- Corridor Supervisors
- CHPEA

For Police, final average pay is loaded by a percentage for assumed private duty and overtime as follows: Pre-7/1/1999 hires: 43%; Post 7/1/1999 hires: 19% for employees remaining in the pre 2012 plan; 25% 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	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 2016 base of \$118,500 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 2016 valuation, \$2,564,350 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, 2016, the City payment will be \$303,918 (\$850,000 on a present value basis) and the pension fund payment will be \$276,288 (\$772,000 on a present value basis).

***For a detailed description of the prior year assumptions and the impact of the changes on liability, see the July 1, 2010 to June 30, 2015 Experience Study report.***



## Section IV

### Hartford MERF - Summary of Principal Provisions of Pension Plan July 1, 2016

#### 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.

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 the July 1, 2013 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 and MLA employees hired after November 26, 2013, 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.

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, 2013 or hired between July 1, 1999 and June 30, 2013 opting into 2013 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).

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, 2013, 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.

**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 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 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: 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 SCG members, reduction is 2% per whole year and fraction of a year prior to age 60.

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:**

**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)**

**Pensions for Permanent, Total Disability - Service Requirements:**

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

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

**POLICE OFFICERS AND FIREFIGHTERS**

Refund of total contributions, without interest.

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

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

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

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.

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

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.

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

**BOARD OF EDUCATION MEMBERS**

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

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. 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).

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.

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-<sup>2</sup>/3 of the reduction in income times years of service.

**MUNICIPAL SERVICES & LIBRARY 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 2013 plan, rate increases to 8.0%*

*Sworn Police Officers hired after June 30, 2013, 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, 2013 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.

**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. For HMEA hired before July 1, 2003, 7.8% on all 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.