



CITY OF HARTFORD & BOARD OF EDUCATION

GASB 45 VALUATION REPORT

AS OF JULY 1, 2015



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Actuarial Certification

This report presents the results of the July 1, 2015 Actuarial Valuation for City of Hartford post-retirement benefit other than pension (OPEB) for City and Board of Education Employees (the Plan) for the purpose of estimating the funded status of the Plan and determining the Annual Required Contribution (ARC) for the fiscal years ending June 30, 2016, June 30, 2017 and June 30, 2018. This report is intended to satisfy the requirements of Connecticut General Statute 7-450a. This report may not be appropriate for any other purpose.

The valuation has been performed in accordance with generally accepted actuarial principles and practices. It is intended to comply with all applicable Actuarial Standards of Practice.

I certify that the actuarial assumptions and methods that were selected by me and represent my best estimate of anticipated actuarial experience under the Plan.

In preparing this valuation, I have relied on employee data provided by the Plan Sponsor, and on asset and contribution information provided by the City. 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 have no relationship with the employer or the Plan that would impair, or appear to impair, my objectivity in performing the work presented in this report. I am a member of the American Academy of Actuaries and meet its Qualification Standards to render the actuarial opinion contained herein.



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

November 10, 2016



Executive Summary

Below is a history of the Actuarial Accrued Liability (AAL) and Annual Required Contribution (ARC):

Schedule of Funding Status and Funding Progress*						
Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL)	Unfunded AAL (UAAL)	Funded Ratio	Covered Payroll	UAAL as a Percentage of Covered Payroll
7/1/2011	\$0	\$261,782,000	\$261,782,000	0%	N/A	N/A
7/1/2012	0	273,326,000	273,326,000	0%	N/A	N/A
7/1/2013	0	262,716,000	262,716,000	0%	N/A	N/A
7/1/2015**	0	327,420,000	327,420,000	0%	N/A	N/A
7/1/2015 ¹	17,868,000 †	313,061,000	295,193,000	6%	N/A	N/A

History of Annual Required Contribution (ARC)*	
Year Ended June 30	Annual Required Contribution (ARC)
2011	\$15,759,000
2012	18,322,000
2013	18,937,000
2014	19,991,000
2015	20,955,000
2016	24,394,000

* Figures shown prior to July 1, 2015 are based on the prior actuary's valuations.

** City and Board of Education liabilities at 4.5%

¹ City liabilities at 4.5%, Board of Education liabilities at 7.5%. Assets are Board of Education only.

† June 30, 2016 Assets of \$19,208,624 rolled back to July 1, 2015 (divided by 1.075)



Unfunded Actuarial Accrued Liability and Annual Required Contribution

GASB 45 Unfunded Actuarial Accrued Liability (UAAL)*			
Actuarial Accrued Liability (AAL) 7/1/2015	City	Board of Education	Grand Total
Actives	\$122,572,000	\$16,116,000	\$138,688,000
Retirees	<u>\$156,468,000</u>	<u>\$32,264,000</u>	<u>188,732,000</u>
Total	279,040,000	48,380,000	327,420,000
Assets 7/1/2015	<u>0</u>	<u>0</u>	<u>0</u>
Unfunded Actuarial Accrued Liability (UAAL) 7/1/2015	279,040,000	48,380,000	327,420,000

GASB 45 Annual Required Contribution (ARC)*			
Annual Required Contribution (ARC) 2015 / 2016 Fiscal Year	City	Board of Education	Grand Total
Normal Cost	\$9,191,000	\$873,000	\$10,064,000
Amortization of UAAL	11,756,000	2,038,000	13,794,000
Interest	<u>471,000</u>	<u>65,000</u>	<u>536,000</u>
Total ARC 2015 / 2016	21,418,000	2,976,000	24,394,000

*City and Board of Education at 4.5%



Unfunded Actuarial Accrued Liability and Annual Required Contribution (continued)

City Detail

GASB 45 Unfunded Actuarial Accrued Liability (UAAL)*				
Actuarial Accrued Liability (AAL) 7/1/2015	Fire	Police	All Others	Grand Total
Actives	\$66,552,000	\$31,763,000	\$24,257,000	\$122,572,000
Retirees	<u>\$67,479,000</u>	<u>\$18,610,000</u>	<u>\$70,379,000</u>	<u>156,468,000</u>
Total	134,031,000	50,373,000	94,636,000	279,040,000
Assets 7/1/2015	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Unfunded Actuarial Accrued Liability (UAAL) 7/1/2015	134,031,000	50,373,000	94,636,000	279,040,000

GASB 45 Annual Required Contribution (ARC)*				
Annual Required Contribution (ARC) 2015 / 2016 Fiscal Year	Fire	Police	All Others	Grand Total
Normal Cost	\$5,090,000	\$2,412,000	\$1,689,000	\$9,191,000
Amortization of UAAL	5,647,000	2,122,000	3,987,000	11,756,000
Interest	<u>241,000</u>	<u>102,000</u>	<u>128,000</u>	<u>471,000</u>
Total ARC 2015 / 2016	10,978,000	4,636,000	5,804,000	21,418,000

*All at 4.5%



Unfunded Actuarial Accrued Liability and Annual Required Contribution (continued)

GASB 45 Unfunded Actuarial Accrued Liability (UAAL)*			
Actuarial Accrued Liability (AAL) 7/1/2015	City	Board of Education	Grand Total
Actives	\$122,572,000	\$10,461,000	\$133,033,000
Retirees	<u>\$156,468,000</u>	<u>\$23,560,000</u>	<u>180,028,000</u>
Total	279,040,000	34,021,000	313,061,000
Assets 7/1/2015 **	<u>0</u>	<u>17,868,000</u>	<u>17,868,000</u>
Unfunded Actuarial Accrued Liability (UAAL) 7/1/2015	279,040,000	16,153,000	295,193,000

GASB 45 Annual Required Contribution (ARC)*			
Annual Required Contribution (ARC) 2016 / 2017 Fiscal Year	City	Board of Education	Grand Total
Normal Cost	\$9,605,000	\$586,000	\$10,191,000
Amortization of UAAL	16,393,000	1,272,000	17,665,000
Interest	<u>585,000</u>	<u>70,000</u>	<u>655,000</u>
Total ARC 2016 / 2017	26,583,000	1,928,000	28,511,000

GASB 45 Annual Required Contribution (ARC)*			
Annual Required Contribution (ARC) 2017 / 2018 Fiscal Year	City	Board of Education	Grand Total
Normal Cost	\$10,037,000	\$630,000	\$10,667,000
Amortization of UAAL	16,393,000	1,272,000	17,665,000
Interest	<u>595,000</u>	<u>71,000</u>	<u>666,000</u>
Total ARC 2017 / 2018	27,025,000	1,973,000	28,998,000

*City at 4.5%, Board of Education at 7.5%.

** June 30, 2016 Assets of \$19,208,624 rolled back to July 1, 2015 (divided by 1.075)



Participant Counts and Average Age As of July 1, 2015

Participant Counts			
Group	Active Participants	Retirees*	Total
City	1,551	1,301	2,852
Board of Education	3,186	499	3,685
Total	4,737	1,800	6,537

*Does not include spouses of existing retirees.

Average Age		
Group	Active Average Age	Retiree Average Age
City	44.2	69.1
Board of Education	45.5	71.8



Participant Counts and Average Age As of July 1, 2013**

Participant Counts			
Group	Active Participants	Retirees*	Total
City	1,655	1,391	3,046
Board of Education	3,268	351	3,619
Total	4923	1,742	6,665

*Does not include spouses of existing retirees.

Average Age		
Group	Active Average Age	Retiree Average Age
City	43.4	68.3
Board of Education	45.3	65.2

**Per Segal's revised July 1, 2013 actuarial valuation report dated February 27, 2015.



Projected Benefit Payments

City and Board of Education			
Fiscal Year Beginning July 1st	Currently Active Employees	Currently Retired Employees	Total
2015	\$368,000	\$10,543,000	\$10,911,000
2016	777,000	10,865,000	11,642,000
2017	1,312,000	11,145,000	12,457,000
2018	1,840,000	11,505,000	13,345,000
2019	2,582,000	11,732,000	14,314,000
2020	3,471,000	12,108,000	15,579,000
2021	4,244,000	12,172,000	16,416,000
2022	5,051,000	11,971,000	17,022,000
2023	6,039,000	11,995,000	18,034,000
2024	7,248,000	11,642,000	18,890,000
2025	8,229,000	11,480,000	19,709,000
2026	9,228,000	11,096,000	20,324,000
2027	10,261,000	10,806,000	21,067,000
2028	11,297,000	10,677,000	21,974,000
2029	12,469,000	10,370,000	22,839,000
2030	13,737,000	10,163,000	23,900,000
2031	14,491,000	9,961,000	24,452,000
2032	15,712,000	9,739,000	25,451,000
2033	17,139,000	9,651,000	26,790,000
2034	18,382,000	9,469,000	27,851,000



Projected Benefit Payments

City Only			
Fiscal Year Beginning July 1st	Currently Active Employees	Currently Retired Employees	Total
2015	\$274,000	\$8,936,000	\$9,210,000
2016	500,000	9,164,000	9,664,000
2017	862,000	9,393,000	10,255,000
2018	1,244,000	9,708,000	10,952,000
2019	1,835,000	9,861,000	11,696,000
2020	2,615,000	10,169,000	12,784,000
2021	3,258,000	10,170,000	13,428,000
2022	3,961,000	9,945,000	13,906,000
2023	4,841,000	9,907,000	14,748,000
2024	5,929,000	9,507,000	15,436,000
2025	6,846,000	9,300,000	16,146,000
2026	7,772,000	8,880,000	16,652,000
2027	8,719,000	8,560,000	17,279,000
2028	9,690,000	8,437,000	18,127,000
2029	10,790,000	8,128,000	18,918,000
2030	12,058,000	7,963,000	20,021,000
2031	12,778,000	7,792,000	20,570,000
2032	13,951,000	7,616,000	21,567,000
2033	15,262,000	7,586,000	22,848,000
2034	16,412,000	7,486,000	23,898,000



Projected Benefit Payments

Board of Education Only			
Fiscal Year Beginning July 1st	Currently Active Employees	Currently Retired Employees	Total
2015	\$94,000	\$1,607,000	\$1,701,000
2016	277,000	1,701,000	1,978,000
2017	450,000	1,752,000	2,202,000
2018	596,000	1,797,000	2,393,000
2019	747,000	1,871,000	2,618,000
2020	856,000	1,939,000	2,795,000
2021	986,000	2,002,000	2,988,000
2022	1,090,000	2,026,000	3,116,000
2023	1,198,000	2,088,000	3,286,000
2024	1,319,000	2,135,000	3,454,000
2025	1,383,000	2,180,000	3,563,000
2026	1,456,000	2,216,000	3,672,000
2027	1,542,000	2,246,000	3,788,000
2028	1,607,000	2,240,000	3,847,000
2029	1,679,000	2,242,000	3,921,000
2030	1,679,000	2,200,000	3,879,000
2031	1,713,000	2,169,000	3,882,000
2032	1,761,000	2,123,000	3,884,000
2033	1,877,000	2,065,000	3,942,000
2034	1,970,000	1,983,000	3,953,000



Actuarial Methods

Actuarial Cost Method – Projected Unit Credit

The Normal Cost is derived for each active participant as the actuarial present value of the projected benefits that are attributed to expected service in the current plan year. The Normal Cost for plan benefits is the total of the individual Normal Costs for active participants.

The Accrued Liability is equal to the portion of the present value of future benefits that is allocated to years of service before the valuation date.

Amortization Method

In calculating the ARC for the fiscal year ending June 30, 2016, the Unfunded Accrued Liability is amortized over a closed 30 year period as a level percent of pay with payroll assumed to grow at the rate of future inflation (2.75%). The ARCs for the fiscal year ending June 30, 2017 and June 30, 2018 were calculated by amortizing the July 1, 2015 Unfunded Accrued Liability over a closed 30 year period as a level dollar amount.

Asset Valuation Method

Market Value.

Contribution Policy

TBD.



Actuarial Assumptions - City Employees

Mortality

Pre-retirement: RP2000 Employees Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with no adjustment.

Post-retirement: RP2000 Healthy Annuitants Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with no adjustment.

Disability: RP2000 Disabled Table – male and female rates.

Prior: RP2000 separate annuitant and non-annuitant tables with static projection using Scale AA to the valuation date plus 8 & 17 years, respectively.

Mortality Improvement

Pre and Post-retirement: Projected to date of decrement using Scale MP-2014 (generational mortality).

Disability: None.

Prior: Projected to date of decrement using Scale AA.

We have selected a mortality table commonly used by public pension systems (such as the State of Connecticut). It is a recently published pension mortality study released by the Society of Actuaries. The plan has partially credible data, so actual experience was evaluated and reflected. We are using the MP-2014 mortality projection scale because it is based on the latest published pension mortality study.

Investment Return

4.5% per year.

Since the OPEB plan is not funded, the selection of the discount rate is based on new GASB 74/75 standards which link the discount rate to a 20-year AA municipal bond index for unfunded OPEB plans.

Inflation

2.75%.

Prior: See Segal's revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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.

Retirement Age

Age	<20 yrs svc or over age 65	Service	+20 on yrs svc and under age 65
55	15.0%	20	15%
56-59	7.5%	21	20%
60-64	15.0%	22	15%
65	30.0%	23-25	10%
66-74	15.0%	26-27	15%
75	100%	28	20%
		29	10%
		30	25%
		31-34	10%
		35	100%

Post 65 rates above used for all years of service.

Prior: See Segal's revised July 1, 2013 actuarial valuation report dated February 27, 2015.



Termination

Age	Years of Service					
	<1	1	2	3	4	5+
20-29	27.0%	25.0%	22.0%	19.0%	17.0%	15.0%
30-39	20.0%	17.0%	15.0%	12.0%	10.0%	6.0%
40-49	15.0%	10.0%	9.0%	7.0%	6.0%	5.0%
50+	8.0%	7.0%	6.0%	5.0%	4.0%	3.0%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

The actuarial assumption in regards to rates of decrement shown above is based on the results of an actuarial experience study for the period July 1, 2005 through June 30, 2010.

Disability

Disability benefits were explicitly valued using the DP85 Class 1 Male and Female Disability Incidence Rate Table increased by 10%.

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

Age	Male	Female
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%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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, 2003 through June 30, 2010.

Percent of Active Employees Married

80% of males and 60% of females.

Spouse’s Age

Husbands are assumed to be three years older than their wives.

Medical Trend

7.75 % in 2015, decreasing by 0.5% per year down to 4.75% in 2021 and beyond.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

Health care trend rates reflect both the current and long-term outlook for increases in health care costs. The short term trend rate is based on recent industry surveys, plan experience and near-term expectations. The long term trend rate is based on our general inflation assumption of 2.75% plus 2% to reflect expectations for long-term medical inflation.



Medical Utilization

95%. (Life Insurance: 100%).

The actuarial assumptions in regards to utilization shown above are based on standard assumptions modified for certain plan features such as eligibility for full and early retirement where applicable and input from the plan sponsor.

Medical Premiums (Annual)

Pre-65	Post-65
\$13,343	\$2,888

The average premium was derived by reflecting participation among the various plans offered by the employers.

Age Related Morbidity

Sample Age	Expected Claims (Male)	Expected Claims (Female)
45	\$7,024	\$7,300
50	9,173	8,505
55	12,036	9,908
60	15,506	11,557
64	18,936	13,529

Sample Age	Expected Claims (Male)	Expected Claims (Female)
65	\$4,131	\$4,026
70	4,736	4,611
75	5,149	5,030
80	5,415	5,319
85	5,449	5,355

The sample per capita claims for plans not integrated with Medicare was developed as follows: Using the total count of active participants eligible for post-retirement medical benefits and retirees currently electing medical coverage in a non-Medicare plan, we calculate the total projected claims by multiplying the total count by the average annual rate/premium. Using the cost increases derived from a study sponsored by the Society of Actuaries and prepared by Dale H. Yamamoto from May 2013: "Health care Costs – From Birth to Death", we allocate the total projected claims by age and gender.

Patient Protection and Affordable Care Act (PPACA)

High Cost Plan Excise Tax ("Cadillac Tax"):

Effective in 2020 there will be a 40% excise tax on per capita medical benefit costs in excess of certain thresholds, which (in 2018) are \$10,200 for single coverage and \$27,500 for family coverage for Medicare eligible retirees. Thresholds (in 2018) for retirees who are between ages 55 and 65 are \$11,850 and \$30,950 for single and family coverage respectively.

After 2018, the thresholds are indexed by CPI (CPI +1% in 2018 only). CPI is assumed to be 3.0% in all future years. The impact of this future excise tax has been reflected in plan liabilities.

Other Requirements of PPACA:

Extended coverage for adult children and 100% coverage of preventive care are assumed to be reflected in per capita costs.

Elimination of lifetime maximum benefits and removal of the limits on essential healthcare as assumed to have no impact on plan liabilities.



Actuarial Assumptions – Board of Education (Non-Certified)

Mortality

Pre-retirement: RP2000 Employees Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with no adjustment.

Post-retirement: RP2000 Healthy Annuitants Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with no adjustment.

Disability: RP2000 Disabled Table – male and female rates.

Prior: RP2000 separate annuitant and non-annuitant tables with static projection using Scale AA to the valuation date plus 8 & 17 years, respectively.

Mortality Improvement

Pre and Post-retirement: Projected to date of decrement using Scale MP-2014 (generational mortality).

Disability: None.

Prior: Projected to date of decrement using Scale AA.

We have selected a mortality table commonly used by public pension systems (such as the State of Connecticut). It is a recently published pension mortality study released by the Society of Actuaries. The plan has partially credible data, so actual experience was evaluated and reflected. We are using the MP-2014 mortality projection scale because it is based on the latest published pension mortality study.

Investment Return

4.5% per year.

Since the OPEB plan is not funded, the selection of the discount rate is based on new GASB 74/75 standards which link the discount rate to a 20-year AA municipal bond index for unfunded OPEB plans.

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.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

Retirement Age

Age	Rate
55	10.0%
56-57	5.0%
58-61	10.0%
62-64	15.0%
65	40.0%
66-69	15.0%
70	100%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.



Termination

<u>Age</u>	<u>Years of Service</u>					
	<u><1</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5+</u>
20-29	30.0%	30.0%	28.0%	25.0%	20.0%	15.0%
30-39	25.0%	25.0%	20.0%	18.0%	15.0%	9.0%
40-49	20.0%	17.0%	15.0%	12.0%	10.0%	8.0%
50-54	17.0%	15.0%	12.0%	10.0%	8.0%	6.0%
55+	9.0%	8.0%	8.0%	7.0%	6.0%	5.0%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

The actuarial assumption in regards to rates of decrement shown above is based on the results of an actuarial experience study for the period July 1, 2005 through June 30, 2010.

Disability

Disability benefits were explicitly valued using the DP85 Class 1 Male and Female Disability Incidence Rate Table increased by 10%.

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%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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, 2003 through June 30, 2010.

Percent of Active Employees Married

80% of males and 60% of females.

Spouse’s Age

Husbands are assumed to be three years older than their wives.

Medical Trend

7.75 % in 2015, decreasing by 0.5% per year down to 4.75% in 2021 and beyond.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

Health care trend rates reflect both the current and long-term outlook for increases in health care costs. The short term trend rate is based on recent industry surveys, plan experience and near-term expectations. The long term trend rate is based on our general inflation assumption of 2.75% plus 2% to reflect expectations for long-term medical inflation.



Medical Utilization

95%. (Life Insurance: 100%).

The actuarial assumptions in regards to utilization shown above are based on standard assumptions modified for certain plan features such as eligibility for full and early retirement where applicable and input from the plan sponsor.

Medical Premiums (Annual)

\$10,366 (Medicare eligible retirees pay full cost of coverage)

The average premium was derived by reflecting participation among the various plans offered by the employers.

Age Related Morbidity

Sample Age	Expected Claims (Male)	Expected Claim (Female)
45	\$6,563	\$7,599
50	8,571	8,855
55	11,247	10,315
60	14,489	12,031
64	17,694	14,085

The sample per capita claims for plans not integrated with Medicare was developed as follows: Using the total count of active participants eligible for post-retirement medical benefits and retirees currently electing medical coverage in a non-Medicare plan, we calculate the total projected claims by multiplying the total count by the average annual rate/premium. Using the cost increases derived from a study sponsored by the Society of Actuaries and prepared by Dale H. Yamamoto from May 2013: "Health care Costs – From Birth to Death", we allocate the total projected claims by age and gender.

For plans integrated with Medicare, the premium is assumed to be unaffected by age.

Patient Protection and Affordable Care Act (PPACA)

High Cost Plan Excise Tax ("Cadillac Tax"):

Effective in 2020 there will be a 40% excise tax on per capita medical benefit costs in excess of certain thresholds, which (in 2018) are \$10,200 for single coverage and \$27,500 for family coverage for Medicare eligible retirees. Thresholds (in 2018) for retirees who are between ages 55 and 65 are \$11,850 and \$30,950 for single and family coverage respectively.

After 2018, the thresholds are indexed by CPI (CPI +1% in 2018 only). CPI is assumed to be 3.0% in all future years. The impact of this future excise tax has been reflected in plan liabilities.

Other Requirements of PPACA:

Extended coverage for adult children and 100% coverage of preventive care are assumed to be reflected in per capita costs.

Elimination of lifetime maximum benefits and removal of the limits on essential healthcare as assumed to have no impact on plan liabilities.



Actuarial Assumptions - Fire

Mortality

Pre-retirement: RP2000 Employees Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with blue collar adjustment.

Post-retirement: RP2000 Healthy Annuitants Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with blue collar adjustment. No adjustment reflected for assumed future beneficiaries.

Disability: RP2000 Disabled Table – male and female rates.

Prior: RP2000 separate annuitant and non-annuitant tables with static projection using Scale AA to the valuation date plus 8 & 17 years, respectively.

Mortality Improvement

Pre and Post-retirement: Projected to date of decrement using Scale MP-2014 (generational mortality).

Disability: None.

Prior: Projected to date of decrement using Scale AA.

We have selected a mortality table commonly used by public pension systems (such as the State of Connecticut). It is a recently published pension mortality study released by the Society of Actuaries. The plan has partially credible data, so actual experience was evaluated and reflected. We are using the MP-2014 mortality projection scale because it is based on the latest published pension mortality study.

Investment Return

4.5% per year.

Since the OPEB plan is not funded, the selection of the discount rate is based on new GASB 74/75 standards which link the discount rate to a 20-year AA municipal bond index for unfunded OPEB plans.

Inflation

2.75%.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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.

Retirement Age

Years of Service		
Age	20-24	25-29
45-49	2.5%	5.0%
50-54	5.0%	20.0%
55-59	10.0%	30.0%
60-64	25.0%	40.0%
65+	100.0%	100.0%

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

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.



Termination

Age	Rate
20-39	1.0%
40-44	0.5%
45+	0.0%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

The actuarial assumptions in regard to rates of decrement shown above are based on the results of an actuarial experience study for the period July 1, 2005 through June 30, 2010.

Disability

Disability benefits were explicitly valued using the DP85 Class 1 Male and Female Disability Incidence Rate Table increased by 250% for Firefighter 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%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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, 2003 through June 30, 2010.

Percent of Active Employees Married

80% of males and 60% of females.

Spouse’s Age

Husbands are assumed to be three years older than their wives.

Medical Trend

7.75 % in 2015, decreasing by 0.5% per year down to 4.75% in 2021 and beyond.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

Health care trend rates reflect both the current and long-term outlook for increases in health care costs. The short term trend rate is based on recent industry surveys, plan experience and near-term expectations. The long term trend rate is based on our general inflation assumption of 2.75% plus 2% to reflect expectations for long-term medical inflation.



Medical Utilization

95%. (Life Insurance: 100%).

The actuarial assumptions in regards to utilization shown above are based on standard assumptions modified for certain plan features such as eligibility for full and early retirement where applicable and input from the plan sponsor.

Medical Premiums (Annual)

Pre-65	Post-65
\$13,343	\$2,888

The average premium was derived by reflecting participation among the various plans offered by the employers.

Age Related Morbidity

Sample Age	Expected Claims (Male)	Expected Claim (Female)
45	\$7,024	\$7,300
50	9,173	8,505
55	12,036	9,908
60	15,506	11,557
64	18,936	13,529

Sample Age	Expected Claims (Male)	Expected Claims (Female)
65	\$4,131	\$4,026
70	4,736	4,611
75	5,149	5,030
80	5,415	5,319
85	5,449	5,355

The sample per capita claims for plans not integrated with Medicare was developed as follows: Using the total count of active participants eligible for post-retirement medical benefits and retirees currently electing medical coverage in a non-Medicare plan, we calculate the total projected claims by multiplying the total count by the average annual rate/premium. Using the cost increases derived from a study sponsored by the Society of Actuaries and prepared by Dale H. Yamamoto from May 2013: "Health care Costs – From Birth to Death", we allocate the total projected claims by age and gender.

Patient Protection and Affordable Care Act (PPACA)

High Cost Plan Excise Tax ("Cadillac Tax"):

Effective in 2020 there will be a 40% excise tax on per capita medical benefit costs in excess of certain thresholds, which (in 2018) are \$10,200 for single coverage and \$27,500 for family coverage for Medicare eligible retirees. Thresholds (in 2018) for retirees who are between ages 55 and 65 are \$11,850 and \$30,950 for single and family coverage respectively.

After 2018, the thresholds are indexed by CPI (CPI +1% in 2018 only). CPI is assumed to be 3.0% in all future years. The impact of this future excise tax has been reflected in plan liabilities.

Other Requirements of PPACA:

Extended coverage for adult children and 100% coverage of preventive care are assumed to be reflected in per capita costs.

Elimination of lifetime maximum benefits and removal of the limits on essential healthcare as assumed to have no impact on plan liabilities.



Actuarial Assumptions - Police

Mortality

Pre-retirement: RP2000 Employees Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with blue collar adjustment.

Post-retirement: RP2000 Healthy Annuitants Table – male and female rates, set forward one year, projected by Scale MP-2014 to valuation date with blue collar adjustment. No adjustment reflected for assumed future beneficiaries.

Disability: RP2000 Disabled Table – male and female rates.

Prior: RP2000 separate annuitant and non-annuitant tables with static projection using Scale AA to the valuation date plus 8 & 17 years, respectively.

Mortality Improvement

Pre and Post-retirement: Projected to date of decrement using Scale MP-2014 (generational mortality).

Disability: None.

Prior: Projected to date of decrement using Scale AA.

We have selected a mortality table commonly used by public pension systems (such as the State of Connecticut). It is a recently published pension mortality study released by the Society of Actuaries. The plan has partially credible data, so actual experience was evaluated and reflected. We are using the MP-2014 mortality projection scale because it is based on the latest published pension mortality study.

Investment Return

4.5% per year.

Since the OPEB plan is not funded, the selection of the discount rate is based on new GASB 74/75 standards which link the discount rate to a 20-year AA municipal bond index for unfunded OPEB plans.

Inflation

2.75%.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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.

Retirement Age

Service	Age <50	Age >50
20	50.0%	30.0%
21-24	40.0%	25.0%
25-29	30.0%	15.0%
30+	100.0%	100.0%

100% retire at age 65, regardless of service; must be age 40 to retire.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.



Termination

Age	Rate
20-24	4.0%
25-29	3.0%
30-34	2.5%
35-39	2.0%
40-44	1.0%
45+	0.0%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

The actuarial assumptions in regard to rates of decrement shown above are based on the results of an actuarial experience study for the period July 1, 2005 through June 30, 2010.

Disability

Disability benefits were explicitly valued using the DP85 Class 1 Male and Female Disability Incidence Rate Table increased by 150% for Police.

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%

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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, 2003 through June 30, 2010.

Percent of Active Employees Married

80% of males and 60% of females.

Spouse’s Age

Husbands are assumed to be three years older than their wives.

Medical Trend

7.75 % in 2015, decreasing by 0.5% per year down to 4.75% in 2021 and beyond.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

Health care trend rates reflect both the current and long-term outlook for increases in health care costs. The short term trend rate is based on recent industry surveys, plan experience and near-term expectations. The long term trend rate is based on our general inflation assumption of 2.75% plus 2% to reflect expectations for long-term medical inflation.



Medical Utilization

95%. (Life Insurance: 100%).

The actuarial assumptions in regards to utilization shown above are based on standard assumptions modified for certain plan features such as eligibility for full and early retirement where applicable and input from the plan sponsor.

Medical Premiums (Annual)

Pre-65	Post-65
\$7,536	\$2,888

The average premium was derived by reflecting participation among the various plans offered by the employers.

Age Related Morbidity

Sample Age	Expected Claims (Male)	Expected Claim (Female)	Sample Age	Expected Claims (Male)	Expected Claims (Female)
45	\$7,024	\$7,300	65	\$4,131	\$4,026
50	9,173	8,505	70	4,736	4,611
55	12,036	9,908	75	5,149	5,030
60	15,506	11,557	80	5,415	5,319
64	18,936	13,529	85	5,449	5,355

The sample per capita claims for plans not integrated with Medicare was developed as follows: Using the total count of active participants eligible for post-retirement medical benefits and retirees currently electing medical coverage in a non-Medicare plan, we calculate the total projected claims by multiplying the total count by the average annual rate/premium. Using the cost increases derived from a study sponsored by the Society of Actuaries and prepared by Dale H. Yamamoto from May 2013: "Health care Costs – From Birth to Death", we allocate the total projected claims by age and gender.

Patient Protection and Affordable Care Act (PPACA)

High Cost Plan Excise Tax ("Cadillac Tax"):

Effective in 2020 there will be a 40% excise tax on per capita medical benefit costs in excess of certain thresholds, which (in 2018) are \$10,200 for single coverage and \$27,500 for family coverage for Medicare eligible retirees. Thresholds (in 2018) for retirees who are between ages 55 and 65 are \$11,850 and \$30,950 for single and family coverage respectively.

After 2018, the thresholds are indexed by CPI (CPI +1% in 2018 only). CPI is assumed to be 3.0% in all future years. The impact of this future excise tax has been reflected in plan liabilities.

Other Requirements of PPACA:

Extended coverage for adult children and 100% coverage of preventive care are assumed to be reflected in per capita costs.

Elimination of lifetime maximum benefits and removal of the limits on essential healthcare as assumed to have no impact on plan liabilities.



Actuarial Assumptions - Board of Education Employees (Certified)

Mortality

Retired: RP-2000 Combined Mortality Table projected forward 19 years using scale AA, with a two-year setback for males and females.

Disabled: RP-2000 Combined Mortality Table projected forward eight years using scale AA, with a two-year setback for males and females.

Prior: RP2000 separate annuitant and non-annuitant tables with static projection using Scale AA to the valuation date plus 8 & 17 years, respectively.

Mortality Improvement

Projected to date of decrement using Scale AA.

We have selected a mortality and mortality improvement assumption based on the State of CT TRB 2014 OPEB Valuation.

Investment Return

7.5% per year.

Prior: 4.5% per year.

Inflation

2.75%.

Prior: See Segal's revised July 1, 2013 actuarial valuation report dated February 27, 2015.

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.

Service-Based Withdrawal Rates (until eligible to retire) (from CT State TRS 2014 OPEB Valuation)

Years	Male Rate	Female Rate
0-1	.1400	.1200
1-2	.0850	.0900
2-3	.0550	.0700
3-4	.0450	.0600
4-5	.0350	.0550
5-6	.0250	.0500
6-7	.0240	.0450
7-8	.0230	.0350
8-9	.0220	.0300
9-10	.0210	.0250
10 +	use age-related rates until eligible to retire	

Prior: See Segal's revised July 1, 2013 actuarial valuation report dated February 27, 2015.



Sample Age-Based Withdrawal Rates (until eligible to retire) (from CT State TRS 2014 OPEB Valuation)

Age	Male Rate	Female Rate
25-37	.0120	.0350
40	.0120	.0230
45	.0126	.0130
50	.0196	.0125
55	.0276	.0160
59+	.0300	.0190

Prior: See Segal's revised July 1, 2013 actuarial valuation report dated February 27, 2015.

Assumed Rates of Retirement (from CT State TRS 2014 OPEB Valuation)

Age	Eligible for Normal (Unreduced) Retirement Age 60 and 20 yrs. Serv. or 35 yrs. Serv.		Eligible for Early (Reduced) Retirement Age 55 and 20 yrs. Serv. or 25 yrs. Serv.	
	Male	Female	Male	Female
50-51	27.5%	15.0%	2.0%	2.0%
52	27.5	15.0	3.0	3.0
53	27.5	15.0	3.0	4.0
54	27.5	15.0	4.5	5.0
55	38.5	30.0	4.5	6.0
56	38.5	30.0	7.0	8.5
57	38.5	30.0	10.0	9.5
58	38.5	30.0	11.0	10.0
59	38.5	30.0	12.0	10.0
60	22.0	20.0		
61-62	25.3	22.5		
63-64	27.5	22.5		
65	36.3	30.0		
66-69	27.5	30.0		
70-79	100.0	40.0		
80	100.0	100.0		

Prior: See Segal's revised July 1, 2013 actuarial valuation report dated February 27, 2015.

The decrement assumptions are based on the rates used by the *State of Connecticut Teachers' Retirement Plan (or MERS)* actuaries.

Percent of active Employees married

80% of males and 60% of females.

Spouse's Age

Husbands are assumed to be 3 years older than wives.



Medical Trend

7.75 % in 2015, decreasing by 0.5% per year down to 4.75% in 2021 and beyond.

Prior: See Segal’s revised July 1, 2013 actuarial valuation report dated February 27, 2015.

Health care trend rates reflect both the current and long-term outlook for increases in health care costs. The short term trend rate is based on recent industry surveys, plan experience and near-term expectations. The long term trend rate is based on our general inflation assumption of 2.75% plus 2% to reflect expectations for long-term medical inflation.

Medical Utilization

20% of current active members hired before April 1, 1986 and 10% of existing pre-65 retirees are assumed to be eligible for Medicare and remain enrolled in the BOE Non-Medicare health plan.

The actuarial assumptions in regards to utilization shown above are based on standard assumptions modified for certain plan features such as eligibility for full and early retirement where applicable and input from the plan sponsor.

Medical Premiums (Annual)

Pre-65	Post-65
\$10,366	\$12,657

The average premium was derived by reflecting participation among the various plans offered by the employers.

Age Related Morbidity

Sample Age	Expected Claims (Male)	Expected Claim (Female)
45	\$5,417	\$7,229
50	7,074	8,506
55	9,283	9,908
60	11,959	11,556
65	15,226	14,007
70	18,317	16,384
75	21,019	18,391

The sample per capita claims for plans not integrated with Medicare was developed as follows: Using the total count of active participants eligible for post-retirement medical benefits and retirees currently electing medical coverage in a non-Medicare plan, we calculate the total projected claims by multiplying the total count by the average annual rate/premium. Using the cost increases derived from a study sponsored by the Society of Actuaries and prepared by Dale H. Yamamoto from May 2013: “Health care Costs – From Birth to Death”, we allocate the total projected claims by age and gender.



Patient Protection and Affordable Care Act (PPACA)

High Cost Plan Excise Tax (“Cadillac Tax”):

Effective in 2020 there will be a 40% excise tax on per capita medical benefit costs in excess of certain thresholds, which (in 2018) are \$10,200 for single coverage and \$27,500 for family coverage for Medicare eligible retirees. Thresholds (in 2018) for retirees who are between ages 55 and 65 are \$11,850 and \$30,950 for single and family coverage respectively.

After 2018, the thresholds are indexed by CPI (CPI +1% in 2018 only). CPI is assumed to be 3.0% in all future years. The impact of this future excise tax has been reflected in plan liabilities.

Other Requirements of PPACA:

Extended coverage for adult children and 100% coverage of preventive care are assumed to be reflected in per capita costs.

Elimination of lifetime maximum benefits and removal of the limits on essential healthcare as assumed to have no impact on plan liabilities.



Summary of Principal Plan Provisions

Retiree Medical Eligibility:

Board of Education	Retirement Eligibility
Teachers, Principals, Certified Administrators	Age 60 and 20 years of service or 35 years of service
Local 566	Age 55 and 5 years of service
Building/Ground Supervisors- hired prior to 03/2007	Age 60 and 10 years of service or 20 years of service
Building/Ground Supervisors- hired after 03/2007	Age 60 and 10 years of service or age 55 and 25 years of service
HESP	Age 60 and 5 years of service or age 55 and 25 years of service
All Others	Age 60 and 10 years of service or age 55 and 25 years of service

City	Retirement Eligibility
Local 1716	Age 55 and 25 years of service
Firefighters	20 years of service
CHPEA- hired prior to 10/01/1997	20 years of service
CHPEA- hired on or after 10/01/1997	25 years of service
Non-union	Age 60 and 5 years of service or 20 years of service
HMEA- hired prior to 07/01/2003	20 years of service
HMEA- hired on or after 07/01/2003	Age 55 and 25 years of service
Library	Age 60 and 10 years of service or 25 years of service
MLA	Age 55 and 25 years of service
Police- hired prior to 07/01/1999	20 years of service
Police- hired on or after 07/01/1999	25 years of service
EMBERS	10 years of service



Retiree Medical Contributions:

Board of Education	Retiree Contributions
	<p>Pre-Medicare: 100% of the active/retiree blended plan rate. Medicare eligible: Full cost of coverage.</p> <p>Note: legacy retirees exist who are over 65 and not eligible for Medicare; these retirees pay the blended pre-Medicare rate.</p>

City	Retiree Contributions
EMBERS Retirees	Free coverage
Firefighters – Age 50 and over after retirement	Pay 11% of active premium rate fixed at retirement for retiree and spouse; pay extra cost for family coverage (not fixed) for children.
Firefighters – Before age 50 after retirement	Receive a stipend of \$125 per month up to age 50.
CHPEA	Receive stipend of \$50 per month from age 55 to age 62; free coverage from age 62 to age 65.
Non-Union	Pay 100% of cost of coverage.
HMEA	Receive stipend of \$50 per month from age 55 to age 62; free coverage from age 62 to age 65.
Library	Free coverage from age 62 to age 65.
Police	Receive stipend of \$500 per month until age 65 under the pre July 1, 2012 plan. In the post July 1, 2012 plan, retirees pay at the rate used to determine the equivalent monthly premium for active employees at the time of their retirement minus the employee’s health insurance contribution. This rate remains unchanged after retirement. Employees retired after approval of 2010-2016 Agreement are not allowed to purchase or otherwise remain on City’s plan once reaching age 65.



Dental Benefits:

Dental Eligibility	<p>Employees and their dependents are eligible for coverage if they have retired from their employer.</p> <p>Employees who have been awarded full disability benefits from either Social Security or City and Board of Education’s Long Term Disability carrier are eligible.</p>
Duration of Coverage:	<p>Coverage continues for the lifetime of the retiree, provided the applicable premiums are paid.</p>
Dependent Coverage After Participant Death	<p>Eligible dependents can continue coverage provided the applicable premiums are paid.</p> <p>No coverage if the participant is not eligible to retire.</p>

Retiree Dental Contributions:	
Board of Education	<p>Pre-Medicare: 100% of the active/retiree blended plan rate.</p> <p>Medicare eligible: separately rated.</p>
City	<p>Active/retiree blended rates.</p>



Life Insurance Benefits:

Eligibility:	Employees are eligible for the coverage if they have retired from their employer and are in the groups identified below with coverage amounts. Employees who have been awarded full disability benefits from either Social Security or City and Board of Education's Long Term Disability carrier are eligible.
Duration of Coverage:	Lifetime
Retiree Contributions:	None
Benefits:	Benefits vary according to the retiree's former union/group:

Board of Education:

Union/Group	Coverage Amount
Teachers, Principals/Administrators, Certified Administrators	\$0
School Secretaries, Paraprofessionals, School Special Police Officers, Health Professionals, Local 566, Building/Grounds Supervisors, Non-Administrative/Non-Bargaining	\$5,000
HESP – Salary Grid 514-	\$5,000
HESP – Salary Grid 515+	\$15,000
HSSSA Supervisors – Salary Grid 710-	\$5,000
HSSSA Supervisors – Salary Grid 710+	\$15,000
Certified Administrators, Administrators (Non-Certified, Non-Bargaining)	\$15,000

City:

Union/Group	Coverage Amount
Firefighters, CHPEA	\$5,000
Police	\$6,000
Local 1716, Certain Library Union Retirees	\$7,500
Non-Union, Unclassified, MLA, Non-Union Library, Certain Library Union Retirees	\$15,000
HMEA Retired Prior to 6/1/2008	\$9,000
HMEA Retired on or After 6/1/2008	\$12,000