

City of Boston

**Actuarial Valuation and Review of Other
Postemployment Benefits (OPEB)
as of June 30, 2017**

This report has been prepared at the request of the City of Boston to assist in administering the Plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the City of Boston and may only be provided to other parties in its entirety. The measurements shown in this actuarial valuation may not be applicable for other purposes.



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May 1, 2018

Ms. Sally D. Glora, City Auditor
City of Boston
City Hall, Room M-4
Boston, MA 02201

Dear Ms. Glora:

We are pleased to submit this report on our actuarial valuation of postemployment welfare benefits as of June 30, 2017. The purpose of this report is to calculate an Actuarially Determined Contribution for the City of Boston and the Public Health Commission (PHC) Other Postemployment Benefit (OPEB) plan for the fiscal year ending June 30, 2018. It summarizes the actuarial data used in the valuation and analyzes the experience and changes in assumptions since the prior valuation. The GASB Statement Number 75 disclosure information for the fiscal year ending June 30, 2018 will be provided in a separate report.

This report is based on information received from the City of Boston and vendors employed by the City of Boston. Segal Consulting does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. Segal, however, does review the data for reasonableness and consistency.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security at termination of the plan, or determining short-term cash flow requirements.


Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: retiree group benefits program experience or rates of return on assets differing from that anticipated by the assumptions; changes in 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); and changes in retiree group benefits program provisions or applicable law. Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An actuarial valuation is a measurement at a specific date – it is not a prediction of a plan's future financial condition. We have not been retained to perform an analysis of the potential range of financial measurements, except where otherwise noted.

The actuarial valuation has been completed in accordance with generally accepted actuarial principles and practices. The actuarial calculations were directed under our supervision. We are members of the American Academy of Actuaries and collectively meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the City of Boston and the Public Health Commission are reasonably related to the experience of and the expectations for the Plan.

We look forward to discussing this with you at your convenience.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: 
Kathleen A. Riley, FSA, MAAA, EA
Senior Vice President and Actuary

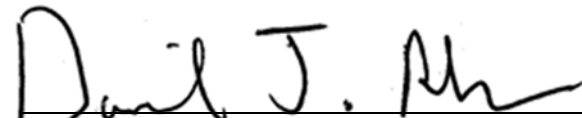

Daniel J. Rhodes, FSA, MAAA
Vice President and Consulting Actuary

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Section 1: Executive Summary

Important Information about Actuarial Valuations

An actuarial valuation is an estimate of future uncertain obligations of a postretirement health plan. As such, it will never forecast the precise future stream of benefit payments. It is an estimated forecast – the actual cost of the plan will be determined by the benefits and expenses paid, not by the actuarial valuation.

In order to prepare a valuation, Segal Consulting (“Segal”) relies on a number of input items. These include:

Plan of Benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. For example, a plan may provide health benefits to post-65 retirees that coordinate with Medicare. If so, changes in the Medicare law or administration may change the plan’s costs without any change in the terms of the plan itself. It is important for the City of Boston to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant Data	An actuarial valuation for a plan is based on data provided to the actuary by the plan. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is not necessary to have perfect data for an actuarial valuation: the valuation is an estimated forecast, not a prediction. The uncertainties in other factors are such that even perfect data does not produce a “perfect” result. Notwithstanding the above, it is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	Part of the cost of a plan will be paid from existing assets – the balance will need to come from future contributions and investment income. The valuation is based on the asset values as of the valuation date, provided by the City of Boston. Some plans include assets, such as private equity holdings, real estate, or hedge funds, that are not subject to valuation by reference to transactions in the marketplace. A snapshot as of a single date may not be an appropriate value for determining a single year’s contribution requirement, especially in volatile markets. Plan sponsors often use an “actuarial value of assets” that differs from market value to reflect gradually year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial Assumptions	In preparing an actuarial valuation, Segal starts by developing a forecast of the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. To determine the future costs of benefits, Segal collects claims, premiums, and enrollment data in order to establish a baseline cost for the valuation measurement, and then develops short- and long-term health care cost trend rates to project increases in costs in future years. This forecast also requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year, as well as forecasts of the plan’s benefits for each of those events. In a funding valuation, the forecasted benefits are then discounted to a present value using the expected rate of return that will be achieved on the plan’s assets. All of these factors are uncertain and unknowable. Thus, there will be a range of reasonable assumptions, and the results may vary materially based on which assumptions the actuary selects within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model necessarily uses approximations and estimates that may lead to significant changes in our results but will have no impact on the actual cost of the plan. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

Given the above, the user of Segal’s actuarial valuation (or other actuarial calculations) needs to keep the following in mind:

- The actuarial valuation is prepared for use by the City of Boston and the PHC. It includes information for compliance with accounting standards. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- If the City of Boston or the PHC is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- An actuarial valuation is a measurement at a specific date — it is not a prediction of a plan’s future financial condition. Accordingly, Segal did not perform an analysis of the potential range of financial measurements, except where otherwise noted. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- Sections of this report may include actuarial results that are not rounded, but that does not imply precision.
- Critical events for a plan include, but are not limited to, decisions about changes in benefits and contributions. The basis for such decisions needs to consider many factors such as the risk of changes in plan enrollment, emerging claims experience and health care cost trend, and investment losses, not just the current valuation results.
- Segal does not provide investment, legal, accounting, or tax advice. Segal’s valuation is based on our understanding of applicable guidance in these areas and of the plan’s provisions, but they may be subject to alternative interpretations. The City of Boston and the PHC should look to their other advisors for expertise in these areas.
- While Segal maintains extensive quality assurance procedures, an actuarial valuation involves complex computer models and numerous inputs. In the event that an inaccuracy is discovered after presentation of Segal’s valuation, Segal may revise that valuation or make an appropriate adjustment in the next valuation.
- Segal’s report shall be deemed to be final and accepted by the City of Boston and the PHC upon delivery and review. The City of Boston and the PHC should notify Segal immediately of any questions or concerns about the final content.

As Segal Consulting has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

Purpose

This report presents the results of our actuarial valuation of the City of Boston and Public Health Commission (PHC) postemployment welfare benefit plan as of June 30, 2017. The purpose of this report is to calculate a recommended Actuarially Determined Contribution for the OPEB plan for the fiscal year ending June 30, 2018.

Highlights of the Valuation

- The unfunded actuarial accrued liability (UAAL) as of June 30, 2017 is \$2.365 billion based on an actuarial accrued liability (AAL) of \$2.836 billion and an actuarial value of assets of \$470 million. Going forward, net unfunded plan obligations will be expected to change due to normal plan operations, which consist of continuing accruals for active members, plus interest on the unfunded actuarial accrued liability, less employer contributions. Future valuations will analyze the difference between actual and expected unfunded actuarial accrued liabilities.
- As of June 30, 2017 the ratio of assets to the AAL (the funded ratio) is 16.59%. This funded percentage is not necessarily appropriate for assessing the sufficiency of OPEB assets to cover the estimated cost of settling the benefit obligations or the need for or the amount of future contributions.
- The discount rate used to determine the liabilities and the Actuarially Determined Contribution is the expected return on assets. Based on the investment allocation of the OPEB Trust, we recommend an expected return on assets of 6.75%. In the prior valuation, the expected return on assets was 7.0%.
- The UAAL of \$2.365 billion as of June 30, 2017 represents an increase of \$102 million from \$2.263 billion as shown in the June 30, 2015 valuation. The unfunded liability had been expected to increase \$128 million due to normal plan operations. The difference between the actual and expected increase was the net effect of the following:
 - An actuarial experience loss increased obligations by \$18 million. This was the net result of asset losses and losses due to demographic changes.
 - Valuation assumption changes decreased obligations by \$44 million. This was the net result of a decrease in obligations due to 1) updating the valuation-year per capita costs, 2) changing the future trend on per capita health care costs, 3) refining our excise tax calculation, along with delaying it until 2022, and 4) increasing the interest rate for the Public Health Commission from 5.5% to 6.75%, partially offset by an increase in obligations due to 5) lowering the interest rate for the City from 7.0% to 6.75%, 6) using the Entry Age Normal methodology to value liabilities, 7) updating the Part B premium and 8) updating the mortality assumptions. The complete set of assumptions is shown in Exhibit II.

- The Actuarially Determined Contribution (ADC) for fiscal year 2018 is \$200 million. The ADC is calculated using a 28-year amortization of the UAAL for the City and a 30-year amortization of the UAAL for the PHC, with payments increasing at 3.25% per year.
- A summary of the valuation results using the 6.75% discount rate appears on page 11.

OPEB Trust Information

As of June 30, 2017, the City of Boston (including PHC) has \$470,447,502 in assets. The table below shows the increase in assets from June 30, 2015 to June 30, 2017.

Reconciliation of OPEB Balance from July 1, 2015 through June 30, 2017	City	PHC	Total
Balance as of June 30, 2015	\$324,261,113	\$10,944,478	\$335,205,591
• Fiscal year 2016 OPEB contributions	40,000,000	2,250,000	42,250,000
• Net investment income	<u>1,573,573</u>	<u>52,138</u>	<u>1,625,710</u>
Balance as of June 30, 2016	\$365,834,686	\$13,246,616	\$379,081,301
• Fiscal year 2017 OPEB contributions	40,000,000	2,250,000	42,250,000
• Net investment income	<u>47,330,133</u>	<u>1,786,068</u>	<u>49,116,201</u>
Balance as of June 30, 2017	\$453,164,818	\$17,282,684	\$470,447,502

Summary of Funding Schedules

This report includes one funding schedule for the City (Funding Schedule 1) and one funding schedule for the PHC (Funding Schedule 2). The funding schedule for the City reflects the City’s policy to contribute \$40 million per year to the OPEB Trust until 2025, then \$100 million per year thereafter. Through fiscal 2042, the City will also pay projected benefit payments. In fiscal 2043, the contribution to the OPEB Trust includes both a funding contribution and an amount to cover a portion of the projected benefit payments (which will start to be paid from the Trust in that year). In fiscal 2044, the funding contribution to the Trust is equal to the normal cost payment and benefit payments continue to be made from the Trust. The liabilities are projected to be fully funded in 2043, if all expectations are met, or one year earlier than in the prior valuation report.

The funding schedule for the PHC reflects the PHC’s policy to contribute \$2.25 million per year to the OPEB Trust. As shown in Funding Schedule 2, a \$2.25 million contribution will not fully fund the obligations over the 30-year period shown.

Other Considerations

This valuation does not include the potential impact of any future changes due to the Patient Protection and Affordable Care Act (PPACA) and the Health Care and Education Reconciliation Act (HCERA) of 2010 other than the excise tax on high cost health plans beginning in 2022 (reflected in this valuation) and those previously adopted as of the valuation date.

Employer decisions regarding plan design, cost sharing between the Employer and its retirees, actuarial cost method, amortization techniques, and integration with Medicare are just some of the decisions that affect the magnitude of OPEB obligations. We are available to assist you with any investigation of such options you may wish to undertake.

Calculations are based on the benefits provided under the terms of the substantive plan in effect at the time of the valuation and on the pattern of sharing costs between the employer and plan members. The projection of benefits does not incorporate the potential effect of legal or contractual funding limitations on the pattern of cost sharing between the employer and plan members in the future.

Actuarial calculations reflect a long-term perspective, and the methods and assumptions use techniques designed to reduce short-term volatility in accrued liabilities and the actuarial value of assets, if any.

The calculation of an accounting obligation does not, in and of itself, imply that there is any legal liability to provide the benefits valued, nor is there any implication that the Employer is required to implement a funding policy to satisfy the projected expense.

Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future, and the actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future.



Section 2: Valuation Results

Summary of Valuation Results – 6.75% Discount Rate

	Boston Public Schools (A)	All Other Departments (City) (B)	Total City (A) + (B)	Public Health Commission (C)	All Departments Total (A) + (B) + (C)
Actuarial Accrued Liability by Participant Category					
1. Current retirees, beneficiaries and dependents	\$749,036,401	\$789,480,247	\$1,538,516,648	\$34,596,137	\$1,573,112,785
2. Current active employees	<u>586,724,951</u>	<u>615,904,468</u>	<u>1,202,629,419</u>	<u>59,807,297</u>	<u>1,262,436,716</u>
3. Total as of June 30, 2017: (1) + (2)	\$1,335,761,352	\$1,405,384,715	\$2,741,146,067	\$94,403,434	\$2,835,549,501
4. Actuarial value of assets as of June 30, 2017	<u>220,827,216</u>	<u>232,337,602</u>	<u>\$453,164,818</u>	<u>17,282,684</u>	<u>470,447,502</u>
5. Unfunded actuarial accrued liability (UAAL) as of June 30, 2017: (3) – (4)	\$1,114,934,136	\$1,173,047,113	\$2,287,981,249	\$77,120,750	\$2,365,101,999
6. Funded ratio: (4) / (3)	16.53%	16.53%	16.53%	18.31%	16.59%
Actuarially Determined Contribution for Fiscal Year Ending June 30, 2018					
7. Normal Cost as of June 30, 2017	\$32,713,719	\$34,650,903	\$67,364,622	\$4,609,886	\$71,974,508
8. 28-year increasing amortization for City (30-year increasing amortization for PHC) (3.25% per year) of the UAAL as of June 30, 2017	<u>60,243,281</u>	<u>63,383,302</u>	<u>123,626,583</u>	<u>3,999,890</u>	<u>127,626,473</u>
9. Total Actuarially Determined Contribution (ADC): (6) + (7)	\$92,957,000	\$98,034,205	\$190,991,205	\$8,609,776	\$199,600,981
10. Projected benefit payments	56,097,244	63,167,944	119,256,188	2,512,293	121,777,481

Notes: Assumes payment at beginning of fiscal year.

Assets are allocated to the Boston Public Schools and All Other Departments in proportion to the Actuarial Accrued Liability.

Funding Schedules

Funding Schedule 1 - Total City (Boston Public Schools and All Other City Departments) 6.75% Discount Rate, Fully Funded in 2043, 28-Year Closed Amortization

Fiscal Year Ending June 30	(1) Normal Cost	(2) Amortization of UAAL	(3) Actuarially Determined Contribution (1) + (2)	(4) Projected Benefits to be Paid by the City	(5) Contribution to OPEB Trust	(6) Total City Cost (4) + (5)	(7) Assets at End of Year	(8) AAL at End of Year	(9) UAAL at End of Year (8) - (7)
2018	\$67,364,622	\$123,626,583	\$190,991,205	\$119,265,188	\$40,000,000	\$159,265,188	\$526,453,443	\$2,874,860,498	\$2,348,407,054
2019	69,658,303	129,741,523	199,399,826	129,393,951	40,000,000	169,393,951	604,689,051	3,009,584,130	2,404,895,079
2020	72,030,081	136,020,844	208,050,925	139,498,196	40,000,000	179,498,196	688,205,562	3,145,493,786	2,457,288,224
2021	74,482,616	142,486,369	216,968,985	149,259,539	40,000,000	189,259,539	777,359,437	3,283,110,015	2,505,750,578
2022	77,018,656	149,183,061	226,201,717	159,080,412	40,000,000	199,080,412	872,531,199	3,422,575,646	2,550,044,447
2023	79,641,044	156,138,338	235,779,382	168,347,370	40,000,000	208,347,370	974,127,055	3,564,679,997	2,590,552,942
2024	82,352,722	163,424,471	245,777,193	177,005,526	40,000,000	217,005,526	1,082,580,631	3,710,325,510	2,627,744,879
2025	85,156,730	171,131,399	256,288,129	185,973,357	40,000,000	225,973,357	1,198,354,824	3,859,529,820	2,661,174,996
2026	88,056,210	179,303,381	267,359,591	195,234,933	100,000,000	295,234,933	1,385,993,774	4,012,331,565	2,626,337,791
2027	91,054,414	183,519,377	274,573,791	204,305,372	100,000,000	304,305,372	1,586,298,354	4,169,276,443	2,582,978,089
2028	94,154,703	187,686,762	281,841,465	213,467,903	100,000,000	313,467,903	1,800,123,493	4,330,657,942	2,530,534,449
2029	97,360,553	191,782,833	289,143,386	223,073,959	100,000,000	323,073,959	2,028,381,829	4,496,429,971	2,468,048,142
2030	100,675,558	195,749,848	296,425,406	233,112,287	100,000,000	333,112,287	2,272,047,602	4,666,558,789	2,394,511,187
2031	104,103,435	199,514,809	303,618,244	243,602,340	100,000,000	343,602,340	2,532,160,815	4,840,992,251	2,308,831,435
2032	107,648,027	202,981,161	310,629,188	254,564,445	100,000,000	354,564,445	2,809,831,670	5,019,657,787	2,209,826,117
2033	111,313,307	206,019,591	317,332,898	266,019,845	100,000,000	366,019,845	3,106,245,308	5,202,460,227	2,096,214,919
2034	115,103,386	208,454,233	323,557,619	277,990,738	100,000,000	377,990,738	3,422,666,866	5,389,279,428	1,966,612,562
2035	119,022,513	210,041,334	329,063,847	290,500,322	100,000,000	390,500,322	3,760,446,880	5,579,967,704	1,819,520,824
2036	123,075,080	210,435,114	333,510,194	303,572,836	100,000,000	403,572,836	4,121,027,044	5,774,347,047	1,653,320,003
2037	127,265,633	209,130,862	336,396,495	317,233,614	100,000,000	417,233,614	4,505,946,370	5,972,206,111	1,466,259,741
2038	131,598,869	205,365,336	336,964,205	331,509,126	100,000,000	431,509,126	4,916,847,750	6,173,296,946	1,256,449,196
2039	136,079,646	197,931,781	334,011,427	346,427,037	100,000,000	446,427,037	5,355,484,973	6,377,331,472	1,021,846,499
2040	140,712,988	184,809,955	325,522,943	362,016,254	100,000,000	462,016,254	5,823,730,208	6,583,977,660	760,247,452
2041	145,504,089	162,352,168	307,856,257	378,306,985	100,000,000	478,306,985	6,323,581,998	6,792,855,400	469,273,403
2042	150,458,321	123,248,341	273,706,662	395,330,799	100,000,000	495,330,799	6,857,173,782	7,003,532,044	146,358,262
2043	155,581,239	50,421,173	206,002,412	0	301,939,501	301,939,501	7,215,517,586	7,215,517,586	0
2044	160,878,586	0	160,878,586	0	160,878,586	160,878,586	7,428,259,456	7,428,259,456	0
2045	166,356,301	0	166,356,301	0	166,356,301	166,356,301	7,641,136,907	7,641,136,907	0

Notes: Assumes payment at the beginning of the fiscal year.

Normal cost is projected to increase 3.25% per year for inflation and 0.15% per year for mortality improvement and does not reflect the future impact of pension reform for new hires.

**Funding Schedule 2 - Public Health Commission
6.75% Discount Rate, 30-Year Open Amortization**

Fiscal Year Ending June 30	(1) Normal Cost	(2) Amortization of UAAL	(3) Actuarially Determined Contribution (1) + (2)	(4) Projected Benefits to be paid by the City	(5) Contribution to OPEB Trust	(6) Total City Cost (4) + (5)	(7) Assets at End of Year	(8) AAL at End of Year	(9) UAAL at End of Year (8) - (7)
2018	\$4,609,886	\$3,999,890	\$8,609,776	\$2,512,293	\$2,250,000	\$4,762,293	\$20,851,140	\$103,101,020	\$82,249,880
2019	4,766,847	4,265,914	9,032,761	3,012,680	2,250,000	5,262,680	24,660,467	112,036,250	87,375,783
2020	4,929,152	4,531,771	9,460,923	3,530,180	2,250,000	5,780,180	28,726,924	121,213,189	92,486,266
2021	5,096,983	4,796,827	9,893,810	4,037,804	2,250,000	6,287,804	33,067,866	130,664,255	97,596,389
2022	5,270,529	5,061,865	10,332,394	4,565,322	2,250,000	6,815,322	37,701,822	140,393,496	102,691,674
2023	5,449,984	5,326,134	10,776,118	5,078,886	2,250,000	7,328,886	42,648,570	150,440,416	107,791,846
2024	5,635,550	5,590,656	11,226,206	5,626,972	2,250,000	7,876,972	47,929,223	160,797,312	112,868,089
2025	5,827,433	5,853,937	11,681,370	6,180,891	2,250,000	8,430,891	53,566,321	171,485,825	117,919,504
2026	6,025,850	6,115,930	12,141,780	6,747,266	2,250,000	8,997,266	59,583,923	182,522,445	122,938,523
2027	6,231,022	6,376,243	12,607,265	7,303,159	2,250,000	9,553,159	66,007,712	193,948,710	127,940,998
2028	6,443,181	6,635,697	13,078,878	7,889,048	2,250,000	10,139,048	72,865,108	205,767,388	132,902,280
2029	6,662,563	6,893,016	13,555,579	8,510,309	2,250,000	10,760,309	80,185,378	217,976,131	137,790,753
2030	6,889,415	7,146,558	14,035,973	9,096,598	2,250,000	11,346,598	87,999,766	230,645,375	142,645,610
2031	7,123,991	7,398,356	14,522,347	9,684,297	2,250,000	11,934,297	96,341,625	243,812,993	147,471,368
2032	7,366,554	7,648,646	15,015,200	10,289,592	2,250,000	12,539,592	105,246,560	257,502,971	152,256,412
2033	7,617,376	7,896,823	15,514,199	10,828,226	2,250,000	13,078,226	114,752,577	271,828,260	157,075,682
2034	7,876,738	8,146,776	16,023,514	11,417,894	2,250,000	13,667,894	124,900,251	286,788,130	161,887,879
2035	8,144,931	8,396,362	16,541,293	11,995,925	2,250,000	14,245,925	135,732,893	302,446,866	166,713,972
2036	8,422,256	8,646,669	17,068,925	12,571,178	2,250,000	14,821,178	147,296,739	318,864,260	171,567,521
2037	8,709,023	8,898,400	17,607,423	13,136,881	2,250,000	15,386,881	159,641,143	336,111,468	176,470,324
2038	9,005,555	9,152,685	18,158,240	13,728,041	2,250,000	15,978,041	172,818,796	354,228,624	181,409,829
2039	9,312,183	9,408,874	18,721,057	14,345,803	2,250,000	16,595,803	186,885,939	373,257,743	186,371,804
2040	9,629,251	9,666,228	19,295,479	14,991,364	2,250,000	17,241,364	201,902,615	393,242,805	191,340,190
2041	9,957,115	9,923,915	19,881,030	15,665,975	2,250,000	17,915,975	217,932,917	414,229,845	196,296,928
2042	10,296,142	10,180,998	20,477,140	16,370,944	2,250,000	18,620,944	235,045,264	436,267,049	201,221,786
2043	10,646,713	10,436,427	21,083,140	17,107,637	2,250,000	19,357,637	253,312,694	459,404,849	206,092,155
2044	11,009,220	10,689,030	21,698,250	17,877,480	2,250,000	20,127,480	272,813,176	483,696,025	210,882,850
2045	11,384,070	10,937,501	22,321,571	18,681,967	2,250,000	20,931,967	293,629,940	509,195,814	215,565,874
2046	11,771,683	11,180,387	22,952,070	19,522,656	2,250,000	21,772,656	315,851,836	535,962,017	220,110,181
2047	12,172,495	11,416,079	23,588,574	20,401,175	2,250,000	22,651,175	339,573,710	564,055,119	224,481,409

See notes on page 12.



Section 3: Supporting Information

EXHIBIT I – SUMMARY OF PARTICIPANT DATA AS OF JUNE 30, 2017 AND JUNE 30, 2015

Summary of Participant Data as of June 30, 2017	Boston Public Schools (A)	All Other Departments (City) (B)	Total City (A) + (B)	Public Health Commission (C)	All Departments Total (A) + (B) +(C)
Retirees, Beneficiaries and Dependents					
• Number	6,883	7,980	14,863	251	15,114
• Average age	72.7	72.7	72.7	65.7	72.6
Active Employees					
• Number	7,560	6,626	14,186	904	15,090
• Average age	44.2	46.9	45.5	44.6	45.4
• Average years of service	13.3	17.3	15.2	12.0	15.0
• Average age at hire	31.0	29.6	30.3	32.7	30.5
Summary of Participant Data as of June 30, 2015	Boston Public Schools (A)	All Other Departments (City) (B)	Total City (A) + (B)	Public Health Commission (C)	All Departments Total (A) + (B) +(C)
Retirees, Beneficiaries and Dependents					
• Number	6,519	8,169	14,688	209	14,897
• Average age	72.3	72.5	72.4	65.3	72.3
Active Employees					
• Number	7,611	6,688	14,299	896	15,195
• Average age	44.5	46.8	45.5	45.2	45.5
• Average years of service	13.5	17.2	15.2	12.4	15.1
• Average age at hire	31.0	29.5	30.3	32.9	30.5

EXHIBIT II – ACTUARIAL ASSUMPTIONS AND METHODS

Data:	Detailed census data, claims experience, administrative fees, premium rates and summary plan descriptions for postemployment welfare benefits were provided by the City of Boston.
Actuarial Cost Method:	Entry Age Normal – Level percentage of payroll (previously, Projected Unit Credit)
Per Capita Cost Development:	Per capita costs were based on the fully-insured premium rates effective July 1, 2017 (January 1, 2017 and January 1, 2018 for Medicare Advantage plans and Tufts Medicare Preferred Supplement), trended to the midpoint of the valuation year at assumed trend rates. Actuarial factors were applied to the premium to estimate individual retiree and spouse costs by age and by gender.
Insured plans	
<ul style="list-style-type: none"> • Blue Cross Blue Shield Managed Blue for Seniors • Medicare HMO Blue • Tufts Medicare Preferred Supplement • Tufts Medicare Preferred HMO 	
Self-Funded plans	Per capita claims costs were based on the monthly paid claims experience by participant group for the period October 1, 2015 through September 30, 2017 (August 1, 2015 – July 31, 2017 for the Harvard Pilgrim Medicare Enhance plan and November 1, 2015 – October 31, 2017 for the Harvard Pilgrim Health Care HMO). Claims were separated into two 12-month periods and adjusted as follows:
<ul style="list-style-type: none"> • Blue Cross Blue Shield Master Medical Carveout • Blue Care Elect Preferred PPO • Harvard Pilgrim Health Care HMO • Harvard Pilgrim Health Care Medicare Enhance • Neighborhood Health Plan HMO 	<ul style="list-style-type: none"> • paid claims were multiplied by a factor to yield an estimate of incurred claims, • total claims were divided by the number of adult members to yield a per capita claim cost, and • the per capita claim cost was trended to the midpoint of the valuation year at assumed trend rates. <p>Taking a weighted average, per capita claims for the two periods were combined. The weights used in this average account for a number of factors including each plan year's volatility of claims experience and distance to the valuation year. Actuarial factors were then applied to the weighted average cost to estimate individual retiree and spouse costs by age and by gender.</p>
Valuation Date:	June 30, 2017
Roll-Forward Techniques:	The results of the June 30, 2017 actuarial valuation will be used to determine the Actuarially Determined Contribution for the fiscal year ending June 30, 2018.
Expected Return on Assets:	6.75% (previously, 7.0%)
	The long-term expected rate of return on OPEB investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce a long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Discount Rate:

6.75% The discount rate is equal to the expected return on assets. For the City, the discount rate in the prior valuation was 7.0%. For Public Health Commission, the discount rate in the prior valuation of 5.5% was a partially funded discount rate determined in accordance with GASB Statement No. 45.

Salary Increases:

Years of Service	Rate per year (%)			
	Teachers	BRS Excluding Teachers		
		Group 1	Group 2	Group 4
0	7.50	4.00	4.25	4.50
1	7.10	4.00	4.25	4.50
2	7.00	4.00	4.25	4.50
3	6.90	4.00	4.25	4.50
4	6.80	4.00	4.25	4.50
5	6.70	4.00	4.25	4.50
6	6.60	4.00	4.25	4.50
7	6.50	4.00	4.25	4.50
8	6.30	4.00	4.25	4.50
9	6.10	4.00	4.25	4.50
10	5.90	4.00	4.25	4.50
11	5.70	4.00	4.25	4.50
12	5.20	4.00	4.25	4.50
13	4.70	4.00	4.25	4.50
14	4.35	4.00	4.25	4.50
15-16	4.20	4.00	4.25	4.50
17-19	4.10	4.00	4.25	4.50
20 and later	4.00	4.00	4.25	4.50

Note: Includes allowance for inflation of 3.25%.

Asset Valuation Method:

Market Value

Mortality Rates:

Pre-Retirement (Non-Teachers): RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017 set forward 1 year for females (previously, RP-2000 Employee Mortality Table projected generationally with Scale BB2D from 2009)

Healthy (Non-Teachers): RP-2014 Blue Collar Annuitant Mortality Table projected generationally with Scale MP-2017 set forward 1 year for females (previously, RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2009)

Disabled (Non-Teachers): RP-2014 Blue Collar Annuitant Mortality Table projected generationally with Scale MP-2017 set forward 1 year (previously, RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2015)

Pre-Retirement (Teachers): RP-2014 White Collar Employee Mortality Table projected generationally with Scale MP-2016 (previously, RP-2014 Employee Mortality Table projected generationally with Scale BB2D from 2014)

Healthy (Teachers): RP-2014 White Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2016 (previously, RP-2014 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2014)

Disabled (Teachers): RP-2014 Healthy Annuitant Mortality Table set forward 4 years projected generationally with Scale BB2D from 2014

The underlying tables with generational projection to the ages of participants as of the measurement date reasonably reflect the mortality experience of the plan as of the measurement date. The mortality tables were then adjusted to future years using generational projection to reflect future mortality improvement between the measurement date and those years.

Non-Teacher Annuitant Mortality Rates:

Age	Rate per year (%)			
	Current		Previously	
	Male	Female	Male	Female
60	0.85	0.62	0.82	0.62
70	1.97	1.54	2.22	1.67
80	5.19	4.24	6.44	4.59
90	14.64	12.43	18.34	13.17

Note: Rates shown are before generational projection.

Teacher Annuitant Mortality Rates:	Rate per year (%)				
	Age	Current		Previously	
		Male	Female	Male	Female
	60	0.52	0.39	0.78	0.52
	70	1.24	1.06	1.68	1.29
	80	3.73	3.04	4.47	3.48
	90	12.62	10.02	13.59	10.71

Note: Rates shown are before generational projection.

Termination Rates Before Retirement: • Groups 1 and 2 (excluding Teachers)	Rate per year (%)							
	Age	Mortality				Disability	Withdrawal	
		Current		Previously				
	Male	Female	Male	Female				
	20	0.05	0.02	0.03	0.02	0.03	6.58	
	25	0.06	0.02	0.04	0.02	0.04	5.27	
	30	0.06	0.03	0.04	0.03	0.06	4.83	
	35	0.07	0.03	0.08	0.05	0.07	4.47	
	40	0.08	0.05	0.11	0.07	0.11	3.84	
	45	0.13	0.08	0.15	0.11	0.18	3.21	
	50	0.22	0.14	0.21	0.17	0.30	1.52	
	55	0.36	0.20	0.30	0.25	0.50	0.33	
	60	0.61	0.30	0.49	0.39	0.81	0.00	

Notes: 50% of the disability rates shown represent accidental disability.
 20% of the mortality rates shown represent accidental death.
 Rates shown are before generational projection.

- Group 4

Age	Rate per year (%)					
	Mortality				Disability	Withdrawal
	Current		Previously			
	Male	Female	Male	Female		
20	0.05	0.02	0.03	0.02	0.15	0.00
25	0.06	0.02	0.04	0.02	0.21	0.00
30	0.06	0.03	0.04	0.03	0.28	0.00
35	0.07	0.03	0.08	0.05	0.37	0.00
40	0.08	0.05	0.11	0.07	0.55	0.00
45	0.13	0.08	0.15	0.11	0.90	0.00
50	0.22	0.14	0.21	0.17	1.51	0.00
55	0.36	0.20	0.30	0.25	2.52	0.00
60	0.61	0.30	0.49	0.39	4.07	0.00

Notes: 90% of the disability rates shown represent accidental disability.
 50% of the mortality rates shown represent accidental death.
 Rates shown are before generational projection.

- Teachers

Age	Teachers - Rate per year (%)					Disability
	Mortality					
	Current		Previous			
	Male	Female	Male	Female		
20	0.03	0.01	0.04	0.02	0.00	
25	0.03	0.01	0.05	0.02	0.01	
30	0.03	0.02	0.05	0.02	0.01	
35	0.04	0.02	0.05	0.03	0.01	
40	0.04	0.03	0.06	0.04	0.01	
45	0.07	0.06	0.10	0.07	0.03	
50	0.12	0.09	0.17	0.11	0.05	
55	0.20	0.14	0.28	0.17	0.07	
60	0.33	0.21	0.47	0.24	0.07	

Notes: 35% of the rates shown represent accidental disability.
 75% of the mortality rates shown represent accidental death (previously, 55%).
 Rates shown are before generational projection.

Age	Rate per year (%)					
	0 – 4 Years of Service		5 – 9 Years of Service		10+ Years of Service	
	Male	Female	Male	Female	Male	Female
20	13.0	10.0	5.5	7.0	1.5	5.0
30	15.0	15.0	5.4	8.8	1.5	4.5
40	13.3	10.5	5.2	5.0	1.7	2.2
50	16.2	9.8	7.0	5.0	2.3	2.0

Retirement Rates:

- All Groups (excluding Teachers)

Rate per year (%)			
Age	Groups 1 and 2	Age	Group 4
55	3.0	50	1.0
56	3.0	51	1.0
57	3.0	52	1.0
58	3.0	53	1.0
59	3.0	54	1.0
60	8.0	55	10.0
61	8.0	56	5.0
62	15.0	57	5.0
63	10.0	58	5.0
64	10.0	59	5.0
65	35.0	60	10.0
66	20.0	61	15.0
67	20.0	62	15.0
68	20.0	63	15.0
69	20.0	64	25.0
70	100.00	65	100.00

- Non-TARP Teachers

Age	Rate per year (%)			
	Years of Service			
	Less than 20		20 or more	
	Male	Female	Male	Female
50	0.0	0.0	2.0	1.0
51	0.0	0.0	2.0	1.0
52	0.0	0.0	2.0	1.5
53	0.0	0.0	2.0	2.0
54	0.0	0.0	3.0	2.0
55	3.5	3.5	3.0	4.0
56	3.5	3.5	3.5	4.0
57	5.0	3.5	4.0	4.0
58	5.5	5.0	5.0	6.0
59	6.0	6.5	6.0	8.0
60	7.5	8.5	15.0	15.0
61	12.0	10.0	25.0	20.0
62	14.0	12.0	30.0	20.0
63	14.0	12.0	30.0	25.0
64	14.0	20.0	30.0	30.0
65	30.0	30.0	30.0	40.0
66	30.0	30.0	25.0	30.0
67	30.0	30.0	25.0	30.0
68	30.0	30.0	25.0	30.0
69	30.0	30.0	25.0	30.0
70	100.0	100.0	100.0	100.0

- TARP Teachers

Age	Rate per year (%)					
	Years of Service					
	Less than 20		20 – 29		30 or more	
	Male	Female	Male	Female	Male	Female
50	0.0	0.0	1.0	1.0	2.0	1.5
51	0.0	0.0	1.0	1.0	2.0	1.5
52	0.0	0.0	1.0	1.0	2.0	1.5
53	0.0	0.0	1.5	1.0	2.0	1.5
54	0.0	0.0	2.5	1.0	2.0	2.0
55	5.0	3.0	3.0	3.0	6.0	5.0
56	5.0	3.0	6.0	5.0	20.0	15.0
57	5.0	4.0	10.0	8.0	40.0	35.0
58	5.0	8.0	15.0	10.0	50.0	35.0
59	10.0	8.0	20.0	15.0	50.0	35.0
60	10.0	10.0	25.0	20.0	40.0	35.0
61	20.0	12.0	30.0	25.0	40.0	35.0
62	20.0	12.0	35.0	30.0	35.0	35.0
63	25.0	15.0	40.0	30.0	35.0	35.0
64	25.0	20.0	40.0	30.0	35.0	35.0
65	25.0	25.0	40.0	40.0	35.0	35.0
66	30.0	25.0	40.0	30.0	40.0	35.0
67	30.0	30.0	30.0	30.0	40.0	30.0
68	30.0	30.0	30.0	30.0	40.0	30.0
69	30.0	30.0	30.0	30.0	40.0	30.0
70	100.0	100.0	100.0	100.0	100.0	100.0

Dependents:

Demographic data was available for spouses of current retirees. For future retirees, husbands were assumed to be three years older than their wives. For future retirees who elect to continue their health coverage at retirement, 60% were assumed to have an eligible spouse who also opts for health coverage at that time.

Per Capita Health Costs:

2017-2018 medical and prescription drug claims costs are shown in the table below for retirees and for spouses at selected ages. These costs are net of deductibles and other benefit plan cost sharing provisions.

Age	Non-Medicare Plans				Master Medical Indemnity Medicare Carveout			
	Retiree		Spouse		Retiree		Spouse	
	Male	Female	Male	Female	Male	Female	Male	Female
45	\$8,948	\$11,225	\$5,550	\$8,379	N/A	N/A	N/A	N/A
50	10,621	12,097	7,418	9,713	N/A	N/A	N/A	N/A
55	12,613	13,022	9,927	11,243	N/A	N/A	N/A	N/A
60	14,979	14,036	13,289	13,040	N/A	N/A	N/A	N/A
64	17,185	14,890	16,776	14,677	N/A	N/A	N/A	N/A
65	17,790	15,122	17,790	15,122	\$5,351	\$4,548	\$5,351	\$4,548
70	20,619	16,296	20,619	16,296	6,202	4,902	6,202	4,902
75	22,220	17,541	22,220	17,541	6,683	5,276	6,683	5,276
80	23,928	18,911	23,928	18,911	7,197	5,688	7,197	5,688

Age	Insured Medicare Supplement Plans				HPHC Medicare Enhance			
	Retiree		Spouse		Retiree		Spouse	
	Male	Female	Male	Female	Male	Female	Male	Female
45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
65	\$4,313	\$3,666	\$4,313	\$3,666	\$4,207	\$3,576	\$4,207	\$3,576
70	4,999	3,951	4,999	3,951	4,876	3,854	4,876	3,854
75	5,387	4,253	5,387	4,253	5,255	4,148	5,255	4,148
80	5,801	4,585	5,801	4,585	5,658	4,472	5,658	4,472

Medicare Part B Premium for Current Retirees:	\$1,608
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Weighted Average Annual Retiree Contribution Amounts:

	Retiree	Married Spouse
Non-Medicare Plans	\$2,610	\$4,132
Insured Medicare Supplement Plans	547	547
HPHC Medicare Enhance	611	611
Blue Cross Blue Shield Master Medical Carveout A&B	1,803	1,803

Health Care Cost Trend Rates:

Health care trend measures the anticipated overall rate at which health plan costs are expected to increase in future years. The rates shown below are “net” and are applied to the net per capita costs shown above. The trend shown for a particular plan year is the rate that is applied to that year’s cost to yield the next year’s projected cost.

Year Ending June 30	Non-Medicare	Medicare	Medicare Part B
2018	7.00%	7.00%	4.50%
2019	6.50%	6.50%	4.50%
2020	6.00%	6.00%	4.50%
2021	5.50%	5.50%	4.50%
2022	5.00%	5.00%	4.50%
2023 & later	4.50%	4.50%	4.50%

The trend rate assumptions were developed using Segal’s internal guidelines, which are established each year using data sources such as the 2018 Segal Health Trend Survey, internal client results, trends from other published surveys prepared by the S&P Dow Jones Indices, consulting firms and brokers, and CPI statistics published by the Bureau of Labor Statistics.

Retiree Contribution Increase Rate:

Retiree contributions for medical and prescription drug coverage are expected to increase with medical trend.

Administrative Expenses:

Administrative expense loads of \$574 per participant for non-Medicare plans (BCBS PPO, HPHC HMO and NHP), \$635 per participant for the HPHC Medicare Enhance plan and \$295 per participant for the Master Medical Medicare Carveout plan were added to projected incurred self-funded claim costs in developing the benefit obligations. Administrative expenses are assumed to increase at 3.0% per year.

Administrative expenses were based on the current contractual rates for each vendor.

Administrative expenses are not added to fully-insured premium rates, as these expenses are a component of the rate.

Participation and Coverage Election:

- 100% of active employees with coverage are assumed to elect retiree coverage. This assumption includes an allowance for current and future inactive vested participants who may elect retiree coverage at retirement.
- 100% of retirees over age 65 are assumed to remain with their current medical plan for life.
- For future retirees hired before 1986 and current retirees under age 65, 85% are assumed to be eligible for Medicare and are assumed to enroll in a Medicare plan upon reaching age 65 (60% in the HPHC Medicare Enhance plan and 25% in one of the Insured Medicare Supplement plans). 15% are assumed to be ineligible for Medicare and remain enrolled in the non-Medicare plans.
- For future retirees hired after 1986, 70% are assumed to enroll in the HPHC Medicare Enhance Plan upon reaching age 65 and 30% are assumed to enroll in one of the Insured Medicare Supplement plans.
- The participation and coverage election assumptions were based on a review of recent experience and reflect new plan offerings.

Plan Design:	Development of plan liabilities was based on the substantive plan of benefits in effect as described in Exhibit III.
Missing Participant Data:	A missing census item for a given participant was assumed to equal the average value of that item over all other participants of the same status for whom the item is known.
Health Care Reform Assumption:	This valuation does not include the potential impact of any future changes due to the Patient Protection and Affordable Care Act (PPACA) and the Health Care and Education Reconciliation Act (HCERA) of 2010 other than the excise tax on high cost health plans beginning in 2022 (reflected with this valuation) and those previously adopted as of the valuation date. The excise tax calculation assumes that the current cost sharing provisions of the postretirement benefits will also apply to the additional cost of the plan due to the excise tax.
Demographic and Salary Scale Assumptions:	<p>The demographic and salary scale assumptions used in this valuation, except for mortality are the same as used in the Boston Retirement System Actuarial Valuation and Review as of January 1, 2016, dated December 23, 2016, completed by Segal Consulting. The mortality assumptions for non-teachers were updated to reflect mortality tables and mortality scales recently published by the Society of Actuaries. The mortality assumptions for teachers were updated to be consistent with the Teachers' Retirement System Actuarial Valuation Report as of January 1, 2017, dated September 25, 2017, completed by PERAC.</p> <p>A review of the demographic assumptions is beyond the scope of this assignment, however, we have no reason to doubt the reasonableness of the assumptions.</p> <p>The remaining demographic assumptions, such as percent married, relative ages of spouses and enrollment elections, were based on the experience of the Plan and the experience of similar plans.</p>

**Justification for Assumption
Changes Since Prior Valuation:**

Based on past experience and future expectations, the following actuarial assumptions were changed:

- The per capita health care costs were updated to reflect recent experience.
- The trend assumptions were revised to better reflect future expectations.
- The discount rate for the City and the Public Health Commission was changed to the expected return on assets.
- The impact of the excise tax on high cost health plans beginning in 2022 was recalculated with this valuation.
- The mortality assumptions for teachers and non-teachers were updated as described earlier.

EXHIBIT III – SUMMARY OF PLAN

This exhibit summarizes the major benefit provisions as included in the valuation. To the best of our knowledge, the summary represents the substantive plans as of the measurement date. It is not intended to be, nor should it be interpreted as, a complete statement of all benefit provisions.

Eligibility:	<p>Retired and receiving a pension from the Boston Retirement System.</p> <ul style="list-style-type: none"> • Members hired before April 2, 2012 <ul style="list-style-type: none"> – Group 1 and Group 2 (including Teachers): <ul style="list-style-type: none"> » Retirees with at least 10 years of creditable service are eligible at age 55; » Retirees with at least 20 years of creditable service are eligible at any age. – Group 4 <ul style="list-style-type: none"> » Retirees are eligible at age 55; » Retirees with at least 20 years of creditable service are eligible at any age. • Members hired on or after April 2, 2012 <ul style="list-style-type: none"> – Group 1 (including Teachers): <ul style="list-style-type: none"> » Retirees with at least 10 years of creditable service are eligible at age 60. – Group 2 <ul style="list-style-type: none"> » Retirees with at least 10 years of creditable service are eligible at age 55. – Group 4 <ul style="list-style-type: none"> » Retirees are eligible at age 55; » Retirees with at least 10 years of creditable service are eligible at age 50.
Disability:	<p>Accidental (job-related) Disability has no age or service requirement.</p> <p>Ordinary (non-job related) Disability has no age requirement but requires 10 years of creditable service.</p>
Pre-Retirement Death:	<p>Surviving spouses of members who die in active service on Accidental (job-related) Death are eligible at any age.</p> <p>Surviving spouses of members who die in active service on Ordinary (non-job related) Death are eligible after two years of service.</p>
Post-Retirement Death:	<p>Surviving spouse is eligible.</p>

Benefit Types:	Medical and prescription drug benefits are provided to all eligible retirees not enrolled in Medicare through a variety of plans offered by Blue Cross Blue Shield of Massachusetts, Harvard Pilgrim Health Care and Neighborhood Health Plan. Medical and prescription drug benefits are provided to retirees enrolled in Medicare through supplemental plans offered by Blue Cross Blue Shield of Massachusetts, Harvard Pilgrim Health Care, and Tufts Health Plan. The City of Boston also pays 50% of the retiree life insurance premium and reimburses retirees 50% of their Medicare Part B premium.
Medicare Part B Penalty:	Actual penalty amounts for 2,335 retirees and spouses were provided by the City.
Duration of Coverage:	Lifetime.
Dependent Benefits:	Medical and Prescription Drugs.
Dependent Coverage:	Benefits are payable to a spouse for their lifetime, regardless of when the retirees dies.
Retiree Life:	\$5,000
Retiree Contributions:	Premium rates and retiree contributions as of January 1, 2017 and July 1, 2017 are summarized below:

	Monthly Premium (Effective 7/1/2017)	City cost (\$)	Retiree cost (\$)	Retiree cost (%)
<u>Non-Medicare Actives and Retirees</u>				
Harvard Pilgrim HMO				
Individual	\$817.33	\$657.95	\$159.38	19.50%
Family	\$2,200.00	\$1,771.00	\$429.00	19.50%
Neighborhood Health Plan HMO				
Individual	\$681.33	\$548.47	\$132.86	19.50%
Family	\$1,806.67	\$1,454.37	\$352.30	19.50%
BCBS Blue Care Elect Preferred PPO				
Individual	\$1,255.93	\$885.43	\$370.50	29.50%
Family	\$3,098.85	\$2,184.69	\$914.16	29.50%
<u>Non-Medicare Total</u>				
	Monthly Premium (Effective 7/1/2017)	City cost (\$)	Retiree cost (\$)	Retiree cost (%)
<u>Medicare</u>				
BCBS Master Medical Part A&B Carve out	\$556.44	\$406.20	\$150.24	27.0%
<u>Medicare Supplement Plans</u>				
BCBS Managed Blue for Seniors	\$386.34	\$339.98	\$46.36	12.0%
Tufts Medicare Preferred Supplement*	\$388.00	\$341.44	\$46.56	12.0%
Harvard Pilgrim Medicare Enhance*	\$424.13	\$373.23	\$50.90	12.0%
<u>Medicare Advantage Plans</u>				
Medicare HMO Blue*	\$356.59	\$313.80	\$42.79	12.0%
Tufts Medicare Preferred HMO*	\$296.00	\$260.48	\$35.52	12.0%

*Monthly premium rate is effective January 1, 2017.

Plan Changes Since the Prior Valuation: None.

EXHIBIT IV – DEFINITION OF TERMS

The following list defines certain technical terms for the convenience of the reader:

Assumptions or Actuarial Assumptions:	The estimates on which the cost of the Plan is calculated including: <ul style="list-style-type: none"> (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future; (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates; (c) Retirement rates — the rate or probability of retirement at a given age; (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.
Actuarial Accrued Liability (AAL):	Present value of all future benefit payments for current retirees and active employees taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions.
Unfunded Actuarial Accrued Liability (UAAL):	The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There are many approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.
Normal Cost:	The amount of contributions required to fund the benefit allocated to the current year of service.
Actuarially Determined Contribution:	A target or recommended contribution to an OPEB plan for the reporting period based on the most recent measurement available.
Valuation Date:	The date at which the actuarial valuation is performed
Covered Employee Payroll:	The payroll of the employees that are provided OPEB benefits
Entry Age Actuarial Cost Method:	An actuarial cost method where the present value of the projected benefits for an individual is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age
Healthcare Cost Trend Rates:	The rate of change in per capita health costs over time
Discount Rate:	The interest rate used to determine the actuarial present value of projected benefit payments.
Expected Return on Assets:	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Real Rate of Return:	The rate of return on an investment after removing inflation

