City of Boston

Actuarial Valuation and Review of Other Postemployment Benefits (OPEB) as of June 30, 2015 in accordance with GASB Statements No. 43 and No. 45

Segal Consulting

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March 2, 2016

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, 2015 under Governmental Accounting Standards Board (GASB) Statements Number 43 and 45. It establishes the liabilities of the postemployment welfare benefit plan in accordance with GASB Statements Number 43 and 45 for the current year and summarizes the actuarial data.

The measurements shown in this actuarial valuation may not be applicable for other purposes. 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 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.

This report is based on information received from the City of Boston. The actuarial projections were based on the assumptions and methods described in Exhibit II and on the plan of benefits as summarized in Exhibit III.

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

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

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SECTION 1

EXECUTIVE SUMMARY

SECTION 2

VALUATION RESULTS

SECTION 3

VALUATION DETAILS

SECTION 4

SUPPORTING INFORMATION

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, as 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.
- **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, premium, and enrollment data in order to establish a baseline cost for the valuation measurement, and then develops short- and long-term health care cost 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. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved the plan's assets, or if there are no assets, a rate of return on the assets of the employer. 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 may use approximations and estimates that will have an immaterial impact on our results and 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. 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.
- 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.
- Sections of this report 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, 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 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 upon delivery and review. The City of Boston 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 (the "Employer") postemployment welfare benefit plan as of June 30, 2015. The results are in accordance with the Governmental Accounting Standards, which prescribe an accrual methodology for accumulating the value of other postemployment benefits (OPEB) over participants' active working lifetimes. The accounting standard supplements cash accounting, under which the expense for postemployment benefits is equal to benefit and administrative costs paid on behalf of retirees and their dependents (*i.e.*, a pay-as-you-go basis).

HIGHLIGHTS OF THE VALUATION

During the fiscal year ending June 30, 2016, we project the City of Boston and the Public Health Commission will pay benefits (net of retiree contributions) on behalf of retired employees of a little more than $112 million. This amount is less than the annual "cost" (the "Annual Required Contribution," or ARC) of approximately $172 million.

The GASB statements provide the method for selecting the investment return assumption (discount rate). If the benefits are fully funded, the discount rate should be based on the estimated long-term investment yield on the investments expected to be used to finance the payment of benefits. If financing is pay-as-you-go, the discount rate should be based on the expected yield on the assets of the employer. If the benefits are partially funded, a blended discount rate can be used that reflects the proportionate amounts of plan and employer assets expected to be used.

Based on the City's and the Public Health Commission's funding policies, we have determined a blended rate of 7.00% for the City and 5.50% for the Public Health Commission. The blending is based on a funded discount rate of 7.00% and a pay-as-you-go discount rate of 4.50%. In the prior valuation, the blended discount rate was 7.50% for the City and 5.75% for the Public Health Commission, based on a funded discount rate of 7.50% and a pay-as-you-go discount rate of 4.50%.

To determine the amortization payment on the unfunded actuarial accrued liability (UAAL), an amortization period and amortization method must be selected. We have used a 30-year open amortization of the UAAL (the maximum permitted by the GASB statements) for the accounting disclosures, with payments increasing at 4.50% year. The GASB statements allow for either an open or closed amortization period. In open amortization, the period is reset to the initial value every year and the UAAL is reamortized, while under a closed amortization, the remaining period decreases and the UAAL is eventually "paid off."

Assets set aside to fund OPEB liabilities must be held in a trust or equivalent arrangement, through which assets are accumulated and benefits are paid as they come due. Employer contributions to the plan are irrevocable, plan assets are dedicated to providing benefits to retirees and their spouses in accordance with the terms of the plan, and plan assets are legally protected from creditors of the employer.

Chapter 68 of the Acts of 2011 permits municipalities, authorities and certain other government entities of the Commonwealth to establish a liability trust fund for funding retiree benefits (other than pension), also known as Other Post-Employment Benefits (OPEB). The legislation also ensures that these entities have access to the state's investment trust, the State Retiree Benefits Trust Fund (SRBTF) for purposes of investment OPEB funds.

The City of Boston and the Public Health Commission have funded $335,206,000 as of June 30, 2015 in an OPEB Trust Fund. The chart below shows a reconciliation of the OPEB balance from July 1, 2013 to June 30, 2015.

Pages 10 through 12 show funding schedules and ARC projections based on the funding policy of $40 million per year through fiscal year ended June 30, 2025 and $100 million per year thereafter for the City and the funding policy of $2.25 million per year for the Public Health Commission.

GASB guidelines prohibit the offset of OPEB obligations by the future value of Medicare Part D subsidies. Therefore, these calculations do not include an estimate for retiree prescription drug plan federal subsidies that the Employer may be eligible to receive for plan years beginning in 2006.

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.

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 2020 (reflected in this valuation) and those previously adopted as of the valuation date.

Reconciliation of OPEB Balance from July 1, 2013 through June 30, 2015

	City	PHC	Total
Balance as of June 30, 2013	$204,566,857	$5,211,956	$209,778,813
Fiscal year 2014 OPEB contributions	40,000,000	2,250,000	42,250,000
Net investment income	34,759,095	1,029,137	35,788,232
Balance as of June 30, 2014	$279,325,952	$8,491,093	$287,817,045
Fiscal year 2015 OPEB contributions	40,000,000	2,250,000	42,250,000
Net investment income	4,935,161	203,385	5,138,546
Balance as of June 30, 2015	$324,261,113	$10,944,478	$335,205,591

KEY VALUATION RESULTS

- The **unfunded actuarial accrued liability (UAAL)** as of June 30, 2015 is $2.263 billion. 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 total actuarial accrued liability, less contributions. Future valuations will analyze the difference between actual and expected unfunded actuarial accrued liabilities.
    - As of June 30, 2015, the ratio of assets to the AAL (the funded ratio) is 13.03% for the City (excluding Public Health Commission) and 10.08% for the Public Health Commission.

      These funded percentages are 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 **Annual Required Contribution (ARC)** is $172 million. The ARC is expected to remain relatively level as a percentage of payroll, as long as the ARC is fully funded each year. If the ARC is not fully funded, it may be expected to increase as a percentage of payroll over time.

The unfunded liability of $2.263 billion as of June 30, 2015 represents an increase of $121 million from $2.142 billion as shown in the June 30, 2013 Valuation Report.

The unfunded liability had been expected to increase $104 million due to normal plan operations, which consist of continuing accruals for active members, plus interest on the total obligation, less expected employer contributions. The increase was the net effect of the following:

- An **actuarial experience gain** decreased obligations by $51 million. This was the net result of gains and losses due to demographic changes and a small investment loss.

- **Valuation assumption and plan changes** increased obligations by $68 million. This was the net result of *increases* in obligations due to 1) revising the discount rate from 7.50% to 7.00% for the City (Boston Public Schools and All Other City Departments) and from 5.75% to 5.50% for the Public Health Commission, 2) changing the future trend on per capita health care costs, based on our projections of what is likely to occur in the marketplace, 3) revising the mortality assumptions, partially offset by 4) lowering the valuation-year per capita health costs (reflecting both recent claims experience, as well as plan design changes and cost savings resulting from the RFP for the City's non-Medicare plans in 2015), 5) replacing the estimate of the Part B penalty cost with a cost based on penalties provided by the City, 6) revising the future over-65 enrollment assumptions to reflect new plan offerings, 7) recalculating the impact of the excise tax on high cost health plans beginning in 2020, and 8) reflecting the increases in retiree contributions under the current PEC agreement. The complete set of assumptions is shown in Exhibit II and the summary of plan provisions is shown in Exhibit III.

We have calculated liabilities separately for employees and retirees identified as Boston Public Schools, All Other City Departments, and Public Health Commission.

ACCOUNTING REQUIREMENTS

The Governmental Accounting Standards Board (GASB) issued Statement Number 43 -- *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans,* and Statement Number 45 – *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions.* Under these statements, all state and local governmental entities that provide other post employment benefits (OPEB) are required to report the cost of these benefits on their financial statements.

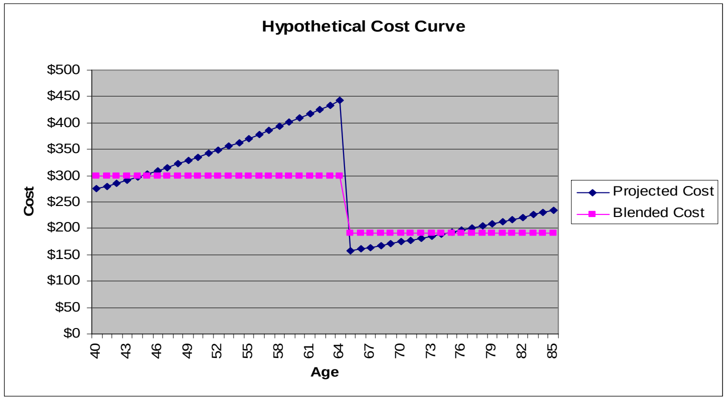
The statements cover postemployment benefits of health, prescription drug, dental, vision and life insurance coverage for retirees; long-term care coverage, life insurance and death benefits that are *not* offered as part of a pension plan; and long-term disability insurance for employees. These benefits, referred to as OPEB, are typically financed on a pay-as-you-go basis. The new standard introduces an accrual-basis accounting requirement; thereby recognizing the employer cost of postemployment benefits over an employee’s career. The standards also introduce a consistent accounting requirement for both pension and non-pension benefits.

The total cost of providing postemployment benefits is projected, taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions. This amount is then discounted to determine the actuarial present value of the total projected benefits (APB). The actuarial accrued liability (AAL) is the portion of the present value of the total projected benefits allocated to years of employment prior to the measurement date. The unfunded actuarial accrued liability (UAAL) is the difference between the AAL and actuarial value of assets in the Plan.

Once the UAAL is determined, the Annual Required Contribution (ARC) is determined as the normal cost (the APB allocated to the current year of service) and the amortization of the UAAL. This ARC is compared to actual contributions made and any difference is reported as the net OPEB obligation (NOO). In addition, required supplementary information (RSI) must be reported, including historical information about the UAAL and the progress in funding the Plan.

The benefits valued in this report are limited to those described in Exhibit III of Section 4.

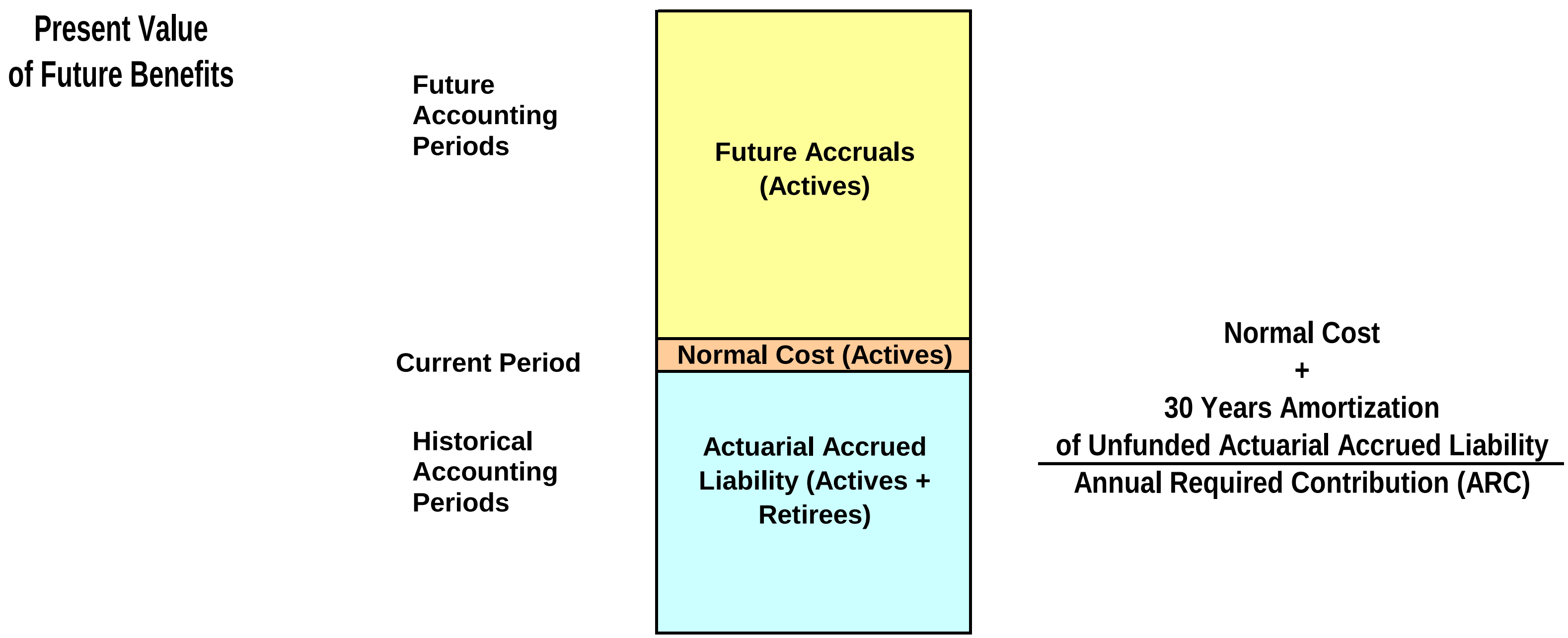
The following graph illustrates why a significant accounting obligation may exist even though the retiree contributes most or all of the blended premium cost of the plan. The average cost for retirees is likely to exceed the average cost for the whole group, leading to an implicit subsidy for these retirees. The accounting standard requires the employer to identify and account for this implicit subsidy as well as any explicit subsidies the employer may provide.



This graph shows how the actuarial present value of the total projected benefits (APB) is broken down and allocated to various accounting periods.

The exact breakdown depends on the actuarial cost method and amortization methods selected by the employer.

GASB 43/45 Measurement



Net OPEB Obligation = $ARC_1 + ARC_2 + ARC_3 + \ldots\ldots$

$- \text{Contribution}_1 - \text{Contribution}_2 - \text{Contribution}_3 - \ldots\ldots$

Actuarial computations under GASB statements are for purposes of fulfilling certain welfare plan accounting requirements. The calculations shown in this report have been made on a basis consistent with our understanding of GASB. Determinations for purposes other than meeting the financial accounting requirements of GASB may differ significantly from the results reported here.

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.

SUMMARY OF VALUATION RESULTS

Actuarial Accrued Liability (AAL) and Annual Required Contribution – 7.00% for City and 5.50% for Public Health Commission

	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	$655,099,389	$753,025,767	$1,408,125,156	$29,903,913	$1,438,029,069
2. Current active members	500,592,581	580,521,528	1,081,114,109	78,619,945	1,159,734,054
3. Total as of June 30, 2015: (1) + (2)	$1,155,691,970	$1,333,547,295	$2,489,239,265	$108,523,858	$2,597,763,123
4. Actuarial value of assets as of June 30, 2015	150,522,009	173,739,104	324,261,113	10,944,478	335,205,591
5. Unfunded actuarial accrued liability (UAAL) as of June 30, 2015: (3) – (4)	$1,005,169,961	$1,159,808,191	$2,164,978,152	$97,579,380	$2,262,557,532
Annual Required Contribution for Fiscal Year Ending June 30, 2016					
6. Normal cost as of June 30, 2015	$30,437,959	$32,003,950	$62,441,909	$6,305,669	$68,747,578
7. 30-year amortization (increasing 4.50% per year) of the UAAL as of June 30, 2015	46,231,925	53,344,377	99,576,302	3,721,660	103,297,962
8. Total Annual Required Contribution (ARC): (6) + (7)	$76,669,884	$85,348,327	$162,018,211	$10,027,329	$172,045,540
9. Projected benefit payments for fiscal year ending June 30, 2016	50,487,331	59,798,978	110,286,309	1,957,329	112,243,638

Note: Assumes payment at beginning of the fiscal year.

PROJECTION OF ARC AND PROJECTION OF ASSETS AND LIABILITIES

30 Years Open (7.00% discount rate)

Total City (Boston Public Schools and All Other City Departments)

Fiscal Year Ended June 30	(1) Projected Benefit Payments	(2) Normal Cost	(3) Amortization of UAAL	(4) ARC (2) + (3)	(5) Funding Contribution	(6) Assets at End of Year	(7) AAL at End of Year	(8) UAAL at End of Year (7) – (6)
2016	$110,286,309	$62,441,909	$99,576,302	$162,018,211	$40,000,000	$389,759,391	$2,612,292,505	$2,222,533,115
2017	119,181,183	65,564,004	102,223,493	167,787,497	40,000,000	459,842,548	2,737,782,600	2,277,940,052
2018	127,188,342	68,842,205	104,771,887	173,614,092	40,000,000	534,831,527	2,866,997,015	2,332,165,489
2019	136,673,932	72,284,315	107,265,939	179,550,254	40,000,000	615,069,734	2,998,789,916	2,383,720,182
2020	145,968,375	75,898,531	109,637,153	185,535,684	40,000,000	700,924,615	3,133,730,476	2,432,805,861
2021	155,248,490	79,693,457	111,894,806	191,588,263	40,000,000	792,789,338	3,272,247,724	2,479,458,386
2022	164,961,073	83,678,130	114,040,549	197,718,679	40,000,000	891,084,592	3,414,332,316	2,523,247,724
2023	174,161,923	87,862,037	116,054,602	203,916,639	40,000,000	996,260,513	3,560,994,699	2,564,734,186
2024	183,564,414	92,255,138	117,962,736	210,217,874	40,000,000	1,108,798,749	3,712,563,404	2,603,764,655
2025	193,327,495	96,867,895	119,757,908	216,625,803	40,000,000	1,229,214,661	3,869,231,070	2,640,016,409
2026	202,993,870	101,711,290	121,425,277	223,136,567	100,000,000	1,422,259,688	4,031,704,885	2,609,445,197
2027	213,143,563	106,796,855	120,019,180	226,816,035	100,000,000	1,628,817,866	4,200,133,248	2,571,315,383
2028	223,800,742	112,136,697	118,265,432	230,402,129	100,000,000	1,849,835,116	4,374,662,048	2,524,826,932
2029	234,990,779	117,743,532	116,127,236	233,870,768	100,000,000	2,086,323,574	4,555,433,838	2,469,110,264
2030	246,740,318	123,630,709	113,564,596	237,195,305	100,000,000	2,339,366,225	4,742,586,925	2,403,220,701
2031	259,077,333	129,812,244	110,534,062	240,346,306	100,000,000	2,610,121,860	4,936,254,365	2,326,132,504
2032	272,031,200	136,302,856	106,988,457	243,291,313	100,000,000	2,899,830,391	5,136,562,842	2,236,732,452
2033	285,632,760	143,117,999	102,876,579	245,994,578	100,000,000	3,209,818,518	5,343,631,447	2,133,812,929
2034	299,914,398	150,273,899	98,142,884	248,416,783	100,000,000	3,541,505,814	5,557,570,315	2,016,064,500
2035	314,910,118	157,787,594	92,727,147	250,514,741	100,000,000	3,896,411,221	5,778,479,136	1,882,067,915
2036	330,655,624	165,676,974	86,564,090	252,241,064	100,000,000	4,276,160,007	6,006,445,520	1,730,285,513
2037	347,188,405	173,960,823	79,582,989	253,543,812	100,000,000	4,682,491,207	6,241,543,193	1,559,051,986
2038	364,547,825	182,658,864	71,707,251	254,366,115	100,000,000	5,117,265,592	6,483,830,028	1,366,564,436
2039	382,775,217	191,791,807	62,853,952	254,645,759	100,000,000	5,582,474,183	6,733,345,881	1,150,871,698
2040	401,913,977	201,381,397	52,933,351	254,314,748	100,000,000	6,080,247,376	6,990,110,232	909,862,856
2041	422,009,676	211,450,467	41,848,357	253,298,824	100,000,000	6,612,864,692	7,254,119,594	641,254,902
2042	443,110,160	222,022,990	29,493,966	251,516,956	100,000,000	7,182,765,221	7,525,344,694	342,579,473
2043	465,265,668	233,124,140	15,756,647	248,880,787	100,000,000	7,792,558,786	7,803,727,388	11,168,601

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

Normal cost is projected to increase 5.0% per year and does not reflect the future impact of pension reform for new hires.

The annual required contributions in this exhibit are calculated using a 30-year open amortization of the UAAL increasing at 4.5% per year.

Assets are assumed to return 7.0% per year.

Through 2043, the employer pays projected benefit payments and funding contributions. In 2044 and later, projected benefit payments are made from the Trust and employer pays normal cost (plus $11 million in 2044).

PROJECTION OF ARC AND PROJECTION OF ASSETS AND LIABILITIES CONTINUED

30 Years Open (5.50% discount rate)
Public Health Commission

Fiscal Year Ended June 30	(1) Projected Benefit Payments	(2) Normal Cost	(3) Amortization of UAAL	(4) ARC (2) + (3)	(5) Funding Contribution	(6) Assets at End of Year	(7) AAL at End of Year	(8) UAAL at End of Year (7) – (6)
2016	$1,957,329	$6,305,669	$3,721,660	$10,027,329	$2,250,000	$14,118,091	$119,080,169	$104,962,077
2017	2,359,608	6,620,952	4,003,235	10,624,187	2,250,000	17,513,858	130,125,296	112,611,438
2018	2,793,923	6,952,000	4,294,980	11,246,980	2,250,000	21,147,328	141,668,959	120,521,631
2019	3,301,002	7,299,600	4,596,673	11,896,273	2,250,000	25,035,141	153,679,273	128,644,132
2020	3,763,066	7,664,580	4,906,464	12,571,044	2,250,000	29,195,101	166,247,730	137,052,630
2021	4,291,065	8,047,809	5,227,163	13,274,972	2,250,000	33,646,258	179,354,721	145,708,463
2022	4,852,193	8,450,200	5,557,294	14,007,494	2,250,000	38,408,996	193,015,128	154,606,132
2023	5,378,774	8,872,710	5,896,650	14,769,360	2,250,000	43,505,126	207,317,061	163,811,936
2024	5,977,043	9,316,345	6,247,758	15,564,103	2,250,000	48,957,984	222,242,463	173,284,479
2025	6,604,976	9,782,162	6,609,039	16,391,201	2,250,000	54,792,543	237,817,731	183,025,187
2026	6,935,224	10,271,270	6,980,548	17,251,818	2,250,000	61,035,521	254,417,234	193,381,713
2027	7,281,986	10,784,834	7,375,544	18,160,378	2,250,000	67,715,508	272,105,687	204,390,179
2028	7,646,085	11,324,076	7,795,404	19,119,480	2,250,000	74,863,093	290,951,780	216,088,687
2029	8,028,389	11,890,279	8,241,583	20,131,862	2,250,000	82,511,010	311,028,422	228,517,413
2030	8,429,809	12,484,793	8,715,613	21,200,406	2,250,000	90,694,280	332,412,995	241,718,714
2031	8,851,299	13,109,033	9,219,108	22,328,141	2,250,000	99,450,380	355,187,619	255,737,239
2032	9,293,864	13,764,485	9,753,772	23,518,257	2,250,000	108,819,407	379,439,443	270,620,036
2033	9,758,557	14,452,709	10,321,399	24,774,108	2,250,000	118,844,265	405,260,942	286,416,677
2034	10,246,485	15,175,344	10,923,880	26,099,224	2,250,000	129,570,864	432,750,240	303,179,377
2035	10,758,809	15,934,112	11,563,207	27,497,319	2,250,000	141,048,324	462,011,448	320,963,123
2036	11,296,750	16,730,817	12,241,475	28,972,292	2,250,000	153,329,207	493,155,018	339,825,811
2037	11,861,587	17,567,358	12,960,895	30,528,253	2,250,000	166,469,751	526,298,133	359,828,381
2038	12,454,666	18,445,726	13,723,789	32,169,515	2,250,000	180,530,134	561,565,097	381,034,963
2039	13,077,400	19,368,012	14,532,605	33,900,617	2,250,000	195,574,743	599,087,774	403,513,030
2040	13,731,270	20,336,413	15,389,914	35,726,327	2,250,000	211,672,475	639,006,027	427,333,552
2041	14,417,833	21,353,233	16,298,424	37,651,657	2,250,000	228,897,049	681,468,206	452,571,157
2042	15,138,725	22,420,895	17,260,982	39,681,877	2,250,000	247,327,342	726,631,647	479,304,304
2043	15,895,661	23,541,940	18,280,579	41,822,519	2,250,000	267,047,756	774,663,211	507,615,455

Notes: Assumes payment at the beginning of the fiscal year.
Normal cost is projected to increase 5.0% per year and does not reflect the future impact of pension reform for new hires.
The annual required contributions in this exhibit are calculated using a 30-year open amortization of the UAAL increasing at 4.5% per year.
Assets are assumed to return 7.0% per year.
Through 2043, the employer pays projected benefit payments and funding contributions. Payments in 2044 and later will depend on funding decisions to be made at a later date.

PROJECTION OF ARC AND PROJECTION OF ASSETS AND LIABILITIES CONTINUED

30 Years Open (7.00% discount rate for City and 5.50% discount rate for Public Health Commission)
All Departments Including Public Health Commission

Fiscal Year Ended June 30	(1) Projected Benefit Payments	(2) Normal Cost	(3) Amortization of UAAL	(4) ARC (2) + (3)	(5) Funding Contribution	(6) Assets at End of Year	(7) AAL at End of Year	(8) UAAL at End of Year (7) – (6)
2016	$112,243,638	$68,747,578	$103,297,962	$172,045,540	$42,250,000	$403,877,482	$2,731,372,674	$2,327,495,192
2017	121,540,791	72,184,957	106,226,728	178,411,685	42,250,000	477,356,406	2,867,907,896	2,390,551,490
2018	129,982,265	75,794,205	109,066,867	184,861,072	42,250,000	555,978,855	3,008,665,974	2,452,687,119
2019	139,974,934	79,583,915	111,862,612	191,446,527	42,250,000	640,104,874	3,152,469,188	2,512,364,314
2020	149,731,441	83,563,111	114,543,617	198,106,728	42,250,000	730,119,716	3,299,978,206	2,569,858,491
2021	159,539,555	87,741,266	117,121,969	204,863,235	42,250,000	826,435,596	3,451,602,445	2,625,166,850
2022	169,813,266	92,128,330	119,597,843	211,726,173	42,250,000	929,493,587	3,607,347,444	2,677,853,856
2023	179,540,697	96,734,746	121,951,252	218,685,998	42,250,000	1,039,765,638	3,768,311,761	2,728,546,122
2024	189,541,457	101,571,483	124,210,494	225,781,977	42,250,000	1,157,756,733	3,934,805,867	2,777,049,134
2025	199,932,471	106,650,058	126,366,947	233,017,005	42,250,000	1,284,007,205	4,107,048,801	2,823,041,596
2026	209,929,094	111,982,560	128,405,825	240,388,385	102,250,000	1,483,295,209	4,286,122,119	2,802,826,910
2027	220,425,549	117,581,688	127,394,724	244,976,412	102,250,000	1,696,533,373	4,472,238,936	2,775,705,562
2028	231,446,826	123,460,773	126,060,836	249,521,609	102,250,000	1,924,698,210	4,665,613,829	2,740,915,619
2029	243,019,168	129,633,811	124,368,819	254,002,630	102,250,000	2,168,834,584	4,866,462,260	2,697,627,676
2030	255,170,126	136,115,502	122,280,209	258,395,711	102,250,000	2,430,060,505	5,074,999,920	2,644,939,415
2031	267,928,632	142,921,277	119,753,170	262,674,447	102,250,000	2,709,572,241	5,291,441,983	2,581,869,743
2032	281,325,064	150,067,341	116,742,229	266,809,570	102,250,000	3,008,649,797	5,516,002,285	2,507,352,488
2033	295,391,317	157,570,708	113,197,978	270,768,686	102,250,000	3,328,662,783	5,748,892,389	2,420,229,606
2034	310,160,883	165,449,243	109,066,764	274,516,007	102,250,000	3,671,076,678	5,990,320,555	2,319,243,877
2035	325,668,927	173,721,706	104,290,354	278,012,060	102,250,000	4,037,459,545	6,240,490,584	2,203,031,038
2036	341,952,374	182,407,791	98,805,565	281,213,356	102,250,000	4,429,489,214	6,499,600,539	2,070,111,325
2037	359,049,992	191,528,180	92,543,884	284,072,064	102,250,000	4,848,960,959	6,767,841,326	1,918,880,367
2038	377,002,492	201,104,590	85,431,040	286,535,630	102,250,000	5,297,795,726	7,045,395,125	1,747,599,399
2039	395,852,616	211,159,819	77,386,557	288,546,376	102,250,000	5,778,048,926	7,332,433,655	1,554,384,729
2040	415,645,247	221,717,810	68,323,265	290,041,075	102,250,000	6,291,919,851	7,629,116,259	1,337,196,408
2041	436,427,510	232,803,700	58,146,781	290,950,481	102,250,000	6,841,761,741	7,935,587,800	1,093,826,059
2042	458,248,885	244,443,885	46,754,948	291,198,833	102,250,000	7,430,092,563	8,251,976,341	821,883,778
2043	481,161,329	256,666,080	34,037,226	290,703,306	102,250,000	8,059,606,542	8,578,390,599	518,784,056

Notes: Assumes payment at the beginning of the fiscal year.
Normal cost is projected to increase 5.0% per year and does not reflect the future impact of pension reform for new hires.
The annual required contributions in this exhibit are calculated using a 30-year open amortization of the UAAL increasing at 4.5% per year.
Assets are assumed to return 7.0% per year.
Through 2043, the employer pays projected benefit payments and funding contributions. Payments in 2044 and later will depend on funding decisions to be made at a later date.

March 2, 2016

ACTUARIAL CERTIFICATION

This is to certify that Segal Consulting, a Member of The Segal Group, Inc. has conducted an actuarial valuation of certain benefit obligations of the City of Boston other postemployment benefit programs as of June 30, 2015, in accordance with generally accepted actuarial principles and practices. The actuarial calculations presented in this report have been made on a basis consistent with our understanding of GASB Statements Number 43 and 45 for the determination of the liability for postemployment benefits other than pensions.

The actuarial valuation is based on the plan of benefits verified by the City and on participant, claims, premium rates and administrative fees provided by the City or from vendors employed by the City. 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 actuarial computations made are for purposes of fulfilling plan accounting requirements. Determinations for purposes other than meeting financial accounting requirements may be significantly different from the results reported here. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security at termination or adequacy of funding an ongoing plan.

To the best of our knowledge, this report is complete and accurate and in our opinion presents the information necessary to comply with GASB Statements Number 43 and 45 with respect to the benefit obligations addressed. The signing actuaries are members of the Society of Actuaries, the American Academy of Actuaries, and other professional actuarial organizations and collectively meet their "General Qualification Standards for Statements of Actuarial Opinion" to render the actuarial opinion contained herein. Further, in our opinion, the assumptions as approved by the City are reasonably related to the experience and expectations of the postemployment benefit programs.

Kathleen A. Riley, FSA, MAAA, EA Senior Vice President and Actuary	Daniel J. Rhodes, FSA, MAAA Vice President and Consulting Actuary

CHART 1
Required Supplementary Information – Schedule of Employer Contributions

Total City (Boston Public Schools and All Other City Departments)

Fiscal Year Ended June 30,	Annual OPEB Cost	Actual Contribution	Percentage Contributed
2008	$327,751,953	$114,929,005	35.1%
2009	346,425,114	128,454,226	37.1%
2010	258,991,410	153,433,928	59.2%
2011	270,750,128	229,808,409	84.9%
2012	196,237,927	180,509,108	92.0%
2013	201,830,098	162,845,023	80.7%
2014	170,248,496	153,638,696	90.2%
2015	175,602,179	162,057,607	92.3%
2016	178,099,431	150,286,309	84.4%
2017	184,536,394	159,181,183	86.3%

Note: The fiscal year ended June 30, 2016 and 2017 actual contributions include a funding payment of $40 million.

CHART 1
Required Supplementary Information – Schedule of Employer Contributions

Public Health Commission

Fiscal Year Ended June 30,	Annual OPEB Cost	Actual Contribution	Percentage Contributed
2008	$16,559,975	$990,398	6.0%
2009	17,877,834	1,268,223	7.1%
2010	11,890,916	1,323,269	11.1%
2011	12,828,317	2,860,172	22.3%
2012	13,267,324	2,946,099	22.2%
2013	14,253,076	4,059,415	28.5%
2014	10,513,336	3,945,421	37.5%
2015	11,197,799	4,259,766	38.0%
2016	11,358,013	4,207,329	37.0%
2017	12,075,433	4,609,608	38.2%

Note: The fiscal year ended June 30, 2016 and 2017 actual contributions include a funding payment of $2.25 million.

This schedule of funding progress presents multi-year trend information about whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liability for benefits.

CHART 2
Required Supplementary Information – Schedule of Funding Progress

Total City (Boston Public Schools and All Other City Departments)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)
6/30/2007	$0	$4,406,624,374	$4,406,624,374	0.00%	$919,662,197	479.2%
6/30/2009	0	3,854,997,685	3,854,997,685	0.00%	1,008,003,640	382.4%
6/30/2011	109,735,953	2,595,942,424	2,486,206,471	4.23%	1,045,487,800	237.8%
6/30/2013	204,566,857	2,257,699,069	2,053,132,212	9.06%	1,021,081,093	201.1%
6/30/2015	324,261,113	2,489,239,265	2,164,978,152	13.03%	1,304,330,627	166.0%

CHART 2

Required Supplementary Information – Schedule of Funding Progress

Public Health Commission

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)
6/30/2007	$0	$112,703,444	$112,703,444	0.00%	$47,922,000	235.2%
6/30/2009	0	95,703,046	95,703,046	0.00%	52,914,849	180.9%
6/30/2011	1,302,422	108,257,905	106,955,483	1.20%	56,913,569	187.9%
6/30/2013	5,211,956	94,402,159	89,190,203	5.52%	59,756,065	149.3%
6/30/2015	10,944,478	108,523,858	97,579,380	10.08%	61,715,680	158.1%

CHART 3
Required Supplementary Information – Net OPEB Obligation/(Asset) (NOO/NOA)

Total City (Boston Public Schools and All Other City Departments)

Fiscal Year Ended June 30,	Annual Required Contribution (a)	Interest on Existing NOO (b)	ARC Adjustment (c)	Annual OPEB Cost (a) + (b) + (c) (d)	Actual Contribution Amount (e)	Net Increase in NOO (d) - (e) (f)	NOO as of Following Date (g)
2008	$327,751,953	$0	$0	$327,751,953	$114,929,005	$212,822,948	$212,822,948
2009	344,100,040	9,577,033	(7,251,959)	346,425,114	128,454,226	217,970,888	430,793,836
2010	252,685,033	22,616,676	(16,310,299)	258,991,410	153,433,928	105,557,482	536,351,318
2011	262,898,498	28,158,444	(20,306,814)	270,750,128	229,808,409	40,941,719	577,293,037
2012	181,732,359	41,853,745	(27,348,177)	196,237,927	180,509,108	15,728,819	593,021,855
2013	186,929,314	42,994,085	(28,093,301)	201,830,098	162,845,023	38,985,075	632,006,930
Adjustment to reflect change in cost method for prior years						7,725,868	639,732,798
2014	153,468,858	47,979,960	(31,200,322)	170,248,496	153,638,696	16,609,800	656,342,598
2015	158,386,880	49,225,695	(32,010,396)	175,602,179	162,057,607	13,544,572	669,887,170
2016	162,018,211	46,892,102	(30,810,882)	178,099,431	150,286,309	27,813,122	697,700,292
2017	167,787,497	48,839,020	(32,090,123)	184,536,394	159,181,183	25,355,211	723,055,503

Note: The fiscal year ended June 30, 2016 and 2017 actual contributions include a funding payment of $40 million.

CHART 3

Required Supplementary Information – Net OPEB Obligation/(Asset) (NOO/NOA)

Public Health Commission

Fiscal Year Ended June 30,	Annual Required Contribution (a)	Interest on Existing NOO (b)	ARC Adjustment (c)	Annual OPEB Cost (a) + (b) + (c) (d)	Actual Contribution Amount (e)	Net Increase in NOO (d) - (e) (f)	NOO as of Following Date (g)
2008	$16,559,975	$0	$0	$16,559,975	$990,398	$15,569,577	$15,569,577
2009	17,707,738	700,631	(530,535)	17,877,834	1,268,223	16,609,611	32,179,188
2010	11,419,846	1,689,407	(1,218,337)	11,890,916	1,323,269	10,567,647	42,746,835
2011	12,202,547	2,244,209	(1,618,439)	12,828,317	2,860,172	9,968,145	52,714,980
2012	12,313,011	3,031,111	(2,076,798)	13,267,324	2,946,099	10,321,225	63,036,205
2013	13,111,915	3,624,582	(2,483,421)	14,253,076	4,059,415	10,193,661	73,229,866
Adjustment to reflect change in cost method for prior years	- -	- -	- -	- -	- -	(7,811,133)	65,418,733
2014	9,329,044	3,761,577	(2,577,285)	10,513,336	3,945,421	6,567,915	71,986,648
2015	9,894,606	4,139,232	(2,836,039)	11,197,799	4,259,766	6,938,033	78,924,681
2016	10,027,329	4,340,857	(3,010,173)	11,358,013	4,207,329	7,150,684	86,075,365
2017	10,624,187	4,734,145	(3,282,899)	12,075,433	4,609,608	7,465,825	93,541,190

Note: The fiscal year ended June 30, 2016 and 2017 actual contributions include a funding payment of $2.25 million.

CHART 4
Summary of Required Supplementary Information

Valuation date	June 30, 2015
Actuarial cost method	Projected Unit Credit
Amortization method	Payments increasing at 4.50% per year
Remaining amortization period	30 years open
Asset valuation method	Market value

Actuarial assumptions:	
Discount rate	7.00% City of Boston, 5.50% Public Health Commission
Inflation rate	4.50%
Asset rate of return	7.00%
Trend on non-Medicare plans	7.00% decreasing by 0.50% to an ultimate level of 5.00% per year
Trend on Medicare plans	8.00% decreasing by 0.50% to an ultimate level of 5.00% per year
Trend on Medicare Part B premium	5.00%
Trend on administrative expenses	3.00%

Plan membership:	Total City (Boston Public Schools and All Other City Departments)	Public Health Commission
Current retirees, beneficiaries, and dependents	14,688	209
Current active participants	14,299	896
Total	28,987	1,105

This exhibit summarizes the participant data used for the current and prior valuations.

EXHIBIT I

Summary of Participant Data as of June 30, 2015 and June 30, 2013

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)
Retires, 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	44.47	46.75	45.54	45.23	45.52
Average years of service	13.47	17.22	15.22	12.38	15.05
Average age at hire	31.00	29.53	30.32	32.85	30.47

Summary of Participant Data as of June 30, 2013

	Boston Public Schools (A)	All Other Departments (City) (B)	Total City (A) + (B)	Public Health Commission (C)	All Departments Total (A) + (B) +(C)
Retires, Beneficiaries and Dependents					
Number	6,352	8,390	14,742	181	14,923
Average Age	71.7	72.3	72.0	63.4	71.9
Active Employees					
Number	7,636	6,750	14,386	960	15,346
Average Age	44.87	46.35	45.56	44.43	45.49
Average years of service	13.52	16.87	15.09	11.63	14.87
Average age at hire	31.35	29.48	30.47	32.80	30.62

EXHIBIT II
Actuarial Assumptions and Actuarial Cost Method

Data: Detailed census data, claims, premium rates, administrative fees and summary plan descriptions for postemployment welfare benefits were provided by the City of Boston.

Actuarial Cost Method: Projected Unit Credit – For active employees, benefits are allocated from date of hire to assumed retirement age.

Per Capita Cost Development:

Insured plans (Neighborhood Health Plan HMO, Blue Cross Blue Shield Managed Blue for Seniors and Medicare HMO Blue, Tufts Medicare Preferred Supplement, Tufts Medicare Preferred HMO)

Per capita costs were based on the fully-insured premium rates effective July 1, 2015 (January 1, 2015 and January 1, 2016 for Medicare Advantage plans and Tufts Medicare Preferred Supplement), trended to the midpoint of the valuation year at assumed trend rates. For plans that are not community rated, actuarial factors were applied to the premium to estimate individual retiree and spouse costs by age and by gender.

Self-Funded plans (Blue Cross Blue Shield Master Medical Carveout, Blue Care Elect Preferred PPO, Harvard Pilgrim Health Care HMO and Harvard Pilgrim Health Care Medicare Enhance)

Per capita claims costs were based on the monthly paid claims experience by participant group for the period September 1, 2013 through August 31, 2015 (August 1, 2013 – July 31, 2015 for the Harvard Pilgrim Medicare Enhance plan). Claims were separated into two 12-month periods and adjusted as follows:

- 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.

	Experience for plans no longer offered were combined in the following way: BCBS Blue Choice POS was combined with the Blue Care Elect Preferred PPO, and HPHC POS was combined with the HPHC HMO. 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.
Measurement Date:	June 30, 2015 The results of the June 30, 2015 actuarial valuation were used to determine the Annual Required Contribution for the fiscal years ending June 30, 2016 and 2017. Assets and liabilities were rolled forward from June 30, 2015 to June 30, 2016 using standard actuarial techniques.
Expected Return on Assets:	7.00% (previously, 7.50%) 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:	7.00% City of Boston and 5.50% Public Health Commission (the blending is based on a funded discount rate of 7.00% and a pay-as-you-go discount rate of 4.50%) (previously, 7.50% City of Boston and 5.75% Public Health Commission, based on a funded discount rate of 7.50% and a pay-as-you-go discount rate of 4.50%). Funded discount rate equal to expected return on assets. Pay-as-you-go discount rate provided by the City of Boston.
Asset Valuation Method:	Market value

Mortality Rates:

Pre-Retirement (Non-Teachers)	RP-2000 Employee Mortality Table projected generationally using Scale BB2D from 2009 (previously, RP-2000 Employee Mortality Table projected 20 years using Scale AA)
Healthy (Non-Teachers)	RP-2000 Healthy Annuitant Mortality Tables projected generationally using Scale BB2D from 2009 (previously, RP-2000 Combined Healthy Mortality Table projected 15 years using Scale AA)
Disabled (Non-Teachers)	RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2015 (previously, RP-2000 Healthy Annuitant Mortality Table projected 5 years using Scale AA with a three-year set forward for males)
Pre-Retirement (Teachers)	RP-2014 Employee Mortality Table projected generationally with Scale BB2D from 2014 (previously, RP-2000 Combined Healthy White Collar Mortality Table projected 20 years using Scale AA)
Healthy (Teachers)	RP-2014 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2014 (previously, RP-2000 Healthy Annuitant with Large Benefit Amount Adjustment Mortality Table projected 15 years with Scale AA)
Disabled (Teachers)	RP-2014 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2014 set forward 4 years (previously, RP-2000 Healthy Annuitant with Large Benefit Amount Adjustment Mortality Table projected 15 years with Scale AA)
	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 the generational projection to reflect future mortality improvement between the measurement date and those years.

Termination Rates before Retirement:

Groups 1 and 2 (excluding Teachers) - Rate per year (%)

	Mortality					
	Current		Previously			
Age	**Male**	**Female**	**Male**	**Female**	**Disability**	**Withdrawal**
20	0.03	0.02	0.02	0.01	0.03	6.58
25	0.04	0.02	0.03	0.02	0.04	5.27
30	0.04	0.03	0.04	0.02	0.06	4.83
35	0.08	0.05	0.07	0.04	0.07	4.47
40	0.11	0.07	0.09	0.05	0.11	3.84
45	0.15	0.11	0.12	0.08	0.18	3.21
50	0.21	0.17	0.15	0.12	0.30	1.52
55	0.30	0.25	0.21	0.22	0.50	0.33
60	0.49	0.39	0.35	0.36	0.81	0.00

Notes: 50% of the disability rates shown represent accidental disability.
20% of the death rates shown represent accidental death.
Current mortality rates shown for base table.

Termination Rates before Retirement:

	Group 4 - Rate per year (%) (non-Teachers)					
	Mortality					
	Current		Previously			
Age	**Male**	**Female**	**Male**	**Female**	**Disability**	**Withdrawal**
20	0.03	0.02	0.02	0.01	0.15	0.00
25	0.04	0.02	0.03	0.02	0.21	0.00
30	0.04	0.03	0.04	0.02	0.28	0.00
35	0.08	0.05	0.07	0.04	0.37	0.00
40	0.11	0.07	0.09	0.05	0.55	0.00
45	0.15	0.11	0.12	0.08	0.90	0.00
50	0.21	0.17	0.15	0.12	1.51	0.00
55	0.30	0.25	0.21	0.22	2.52	0.00
60	0.49	0.39	0.35	0.36	4.07	0.00

Notes: 90% of the disability rates shown represent accidental disability.
50% of the death rates shown represent accidental death.
Current mortality rates shown for base table.

Teachers - Rate per year (%)

	Mortality				
	Current		Previously		
Age	Male	Female	Male	Female	Disability
20	0.04	0.02	0.02	0.01	0.00
25	0.05	0.02	0.03	0.02	0.01
30	0.05	0.02	0.03	0.02	0.01
35	0.05	0.03	0.05	0.04	0.01
40	0.06	0.04	0.08	0.05	0.01
45	0.10	0.07	0.10	0.07	0.03
50	0.17	0.11	0.14	0.11	0.05
55	0.28	0.17	0.23	0.22	0.07
60	0.47	0.24	0.40	0.42	0.07

Notes: 35% of the rates shown represent accidental disability.
55% of the death rates shown represent accidental death.
Current mortality rates shown for base table.

Withdrawal Rates:

Teachers - Rate per year (%)

	0 Years of Service		5 Years of Service		10+ Years of Service	
Age	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:

	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 - Rate per year (%)

	Years of Service			
	Less than 20		20 or more	
Age	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 - Rate per year (%)

	Years of Service					
	Less than 20		20 – 29		30 or more	
Age	**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: 2015-2016 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.

	HPHC HMO/BCBS PPO				NHP			
	Retiree		Spouse		Retiree		Spouse	
Age	Male	Female	Male	Female	Male	Female	Male	Female
45	$8,147	$10,220	$5,053	$7,629	$8,520	$10,689	$5,285	$7,978
50	9,670	11,014	6,754	8,844	10,113	11,519	7,064	9,249
55	11,484	11,856	9,038	10,237	12,010	12,399	9,452	10,705
60	13,638	12,779	12,099	11,872	14,263	13,365	12,653	12,416
64	15,646	13,557	15,274	13,363	16,363	14,178	15,973	13,975
65	16,197	13,767	16,197	13,767	16,939	14,398	16,939	14,398
70	18,772	14,836	18,772	14,836	19,632	15,516	19,632	15,516
75	20,230	15,970	20,230	15,970	21,157	16,702	21,157	16,702
80	21,785	17,217	21,785	17,217	22,783	18,006	22,783	18,006

	Master Medical Indemnity Medicare Carveout*				Insured Medicare Supplement Plans			
	Retiree		Spouse		Retiree		Spouse	
Age	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	$5,123	$4,355	$5,123	$4,355	$4,039	$3,433	$4,039	$3,433
70	5,938	4,693	5,938	4,693	4,681	3,700	4,681	3,700
75	6,399	5,051	6,399	5,051	5,045	3,982	5,045	3,982
80	6,890	5,446	6,890	5,446	5,432	4,293	5,432	4,293

* *Plan will be eliminated effective July 1, 2017.*

Age	HPHC Medicare Enhance			
	Retiree		Spouse	
	Male	Female	Male	Female
45	N/A	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A
55	N/A	N/A	N/A	N/A
60	N/A	N/A	N/A	N/A
64	N/A	N/A	N/A	N/A
65	$4,071	$3,460	$4,071	$3,460
70	4,718	3,729	4,718	3,729
75	5,085	4,014	5,085	4,014
80	5,475	4,327	5,475	4,327

Medicare Advantage Plan: $3,216

Medicare Part B Premium for Current Retirees: $1,259

Weighted Average Annual Retiree Contribution Amounts:

	Retiree	Married Spouse
HPHC HMO/BCBS PPO	$2,216	$3,495
NHP	1,376	2,270
Insured Medicare Supplement Plans	475	475
HPHC Medicare Enhance	489	489
Medicare Advantage Plans	347	347
Blue Cross Blue Shield Master Medical Carveout A&B	1,579	1,579

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
2016	7.00%	8.00%	5.00%
2017	6.50%	7.50%	5.00%
2018	6.00%	7.00%	5.00%
2019	5.50%	6.50%	5.00%
2020	5.00%	6.00%	5.00%
2021	5.00%	5.50%	5.00%
2022 & later	5.00%	5.00%	5.00%

The trend rate assumptions were developed using Segal's internal guidelines, which are established each year using data sources such as the 2015 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, and to account for the increases in retiree contribution percentages described in Exhibit III.

Administrative Expenses: Administrative expense loads of $415 per participant for self-funded non-Medicare plans (BCBS PPO and HPHC HMO), $412 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, 20% in one of the Insured Medicare Supplement plans, and 5% in one of the insured Medicare Advantage plans). 15% are assumed to be ineligible for Medicare and remain enrolled in the self-funded non-Medicare plans (HPHC HMO or the BCBS PPO plans).

For future retirees hired after 1986, 70% are assumed to enroll in the HPHC Medicare Enhance Plan upon reaching age 65, 25% are assumed to enroll in one of the insured Medicare Supplement plans and 5% are assumed to enroll in one of the insured Medicare Advantage 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 2020 and those previously adopted as of the valuation date. The excise tax assumption in this valuation increased the actuarial accrued liability by 0.9% and normal cost by 2.1%.

Demographic Assumptions:	The demographic assumptions, except for mortality, used in this valuation for non-teachers are the same as used in the State-Boston Retirement System Actuarial Valuation and Review as of January 1, 2014, dated February 11, 2015 completed by Segal Consulting. The mortality assumptions for non-teachers are the same as used in the State-Boston Retirement System GASB Statements No. 67 and 68 Accounting Valuation as of December 31, 2014, dated January 5, 2016. The demographic assumptions used for teachers are the same as used in the Teachers' Retirement System Actuarial Valuation Report as of January 1, 2015 dated September 15, 2015. 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.
Assumption Changes since Prior Valuation:	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 was decreased from 7.50% to 7.00% for the City and from 5.75% to 5.00% for the Public Health Commission due to the reduction in the expected return on assets. The mortality assumptions were updated as described earlier. The future over-65 enrollment assumptions were revised to reflect new plan offerings. The impact of the excise tax on high cost health plans beginning in 2020 was recalculated with this valuation.

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: Retired and receiving a pension from the State-Boston Retirement System or the Massachusetts Teachers' Retirement System.

Members hired before April 2, 2012

Group 1 and Group 2 (including Teachers):
- 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
- 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

Group 1 (including Teachers):
- Retirees with at least 10 years of creditable service are eligible at age 60.

Group 2
- Retirees with at least 10 years of creditable service are eligible at age 55.

Group 4
- Retirees are eligible at age 55;
- Retirees with at least 10 years of creditable service are eligible at age 50.

Disability: Accidental (job-related) Disability has no age or service requirement. Ordinary (non-job related) Disability has no age requirement but requires 10 years of creditable service.

	Pre-Retirement Death: Surviving spouses of members who die in active service on Accidental (job-related) Death are eligible at any age. Surviving spouses of members who die in active service on Ordinary (non-job related) Death are eligible after two years of service. **Post-Retirement Death:** Surviving spouse is eligible.
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 and Medicare Advantage 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 2,367 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, 2015 and July 1, 2015 are summarized below:

	Subscribers							
	Active	**Retiree**	**Total**	***Retirees 65 and over***	**Monthly Premium (Effective 7/1/2015)**	**City cost ($)**	**Retiree cost ($)**	**Retiree cost (%)**
Non-Medicare Actives and Retirees								
Harvard Pilgrim HC HMO[1]								
Individual	5,261	1,023	6,284	*400*	$720.65	$587.33	$133.32	18.5%
Family	7,102	914	8,016	*247*	$1,938.59	$1,579.95	$358.64	18.5%
Neighborhood Health Plan HMO[1]								
Individual	958	80	1,038	*38*	$619.68	$505.04	$114.64	18.5%
Family	919	45	964	*8*	$1,642.38	$1,338.54	$303.84	18.5%
BCBS Blue Choice[2]								
Individual	19	1	20	*0*	$1,038.18	$742.30	$295.88	28.5%
Family	9	2	11	*2*	$2,561.82	$1,831.70	$730.12	28.5%
Harvard Pilgrim POS[2]								
Individual	39	4	43	*0*	$720.65	$558.50	$162.15	22.5%
Family	34	3	37	*3*	$1,938.59	$1,502.41	$436.18	22.5%
BCBS Blue Care Elect Preferred PPO[1]								
Individual	474	703	1,177	*455*	$1,038.18	$742.30	$295.88	28.5%
Family	377	199	576	*71*	$2,561.82	$1,831.70	$730.12	28.5%
Non-Medicare Total	**15,192**	**2,974**	**18,166**	*1,224*				

[1] Retirees will pay an additional 0.5% of the premium cost effective July 1, 2016 and an additional 0.5% of the premium cost effective July 1, 2017.

[2] The BCBS Blue Choice and HPHC POS plans were eliminated effective July 1, 2015. Assumes all current participants will enroll in the corresponding BCBS or HPHC plan.

Medicare[3]				Monthly Premium (Effective 7/1/2015)	City cost ($)	Retiree cost ($)	Retiree cost (%)
BCBS Master Medical Part A&B Carveout[4]	1	2,176	2,177	$506.00	$374.44	$131.56	26.0%
Medicare Supplement Plans							
BCBS Managed Blue for Seniors	0	240	240	$343.50	$305.72	$37.79	11.0%
Tufts Medicare Preferred Supplement[5]	0	1,041	1,041	$364.00	$323.96	$40.04	11.0%
Harvard Pilgrim HC Medicare Enhance[5]	2	2,776	2,778	$370.63	$329.86	$40.77	11.0%
Medicare Advantage Plans							
Medicare HMO Blue[5]	0	31	31	$266.44	$237.13	$29.31	11.0%
Tufts Medicare Preferred HMO[5]	0	137	137	$262.00	$233.18	$28.82	11.0%
Total[6]	**15,195**	**9,375**					

[3] Retirees will pay an additional 1% of the premium cost for all Medicare plans effective July 1, 2017.
[4] The BCBS Master Medical Carveout plan will be eliminated effective July 1, 2017.
[5] Monthly premium rate is effective January 1, 2015.
[6] In addition, there are 5,522 spouses of retirees covered under an individual or family policy.

Plan Changes Since the Prior Valuation:

1. Blue Choice POS and Harvard Pilgrim POS plans were eliminated as of July 1, 2015.
2. Copay changes applicable to Blue Care Elect Preferred PPO, HPHC HMO and NHP HMO plans July 1, 2015 include:
   a) PCP/BH/PT: $20 per visit
   b) Specialist: $30 per visit

3. The following contribution changes effective July 1, 2016 are reflected in this valuation:
   a) The HPHC HMO and NHP HMO plan retiree contribution will increase from 18.5% of the premium to 19.0% of the premium.
   b) The Blue Care Elect Preferred PPO retiree contribution will increase from 28.5% of the premium to 29.0% of the premium.
4. The following contribution changes effective July 1, 2017 are reflected in this valuation:
   a) The HPHC HMO and NHP plan retiree contribution will increase from 19.0% of the premium to 19.5% of the premium.
   b) The Blue Care Elect Preferred PPO retiree contribution will increase from 29.0% of the premium to 29.5% of the premium.
   c) The retiree contribution will increase from 11.0% to 12.0% for all Medicare plans.
5. The BCBS Master Medical Carveout Plan will be eliminated effective July 1, 2017.

Note that future changes to the City's plans may occur as the result of the Medicare and prescription drug RFPs that will be issued later this year for a July 1, 2017 or January 1, 2018 effective date. Because the exact nature, magnitude and actual effect dates of these changes are not yet known, we have not incorporated any anticipated savings from these RFPs at this time.

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