

Town of Brookline

**Actuarial Valuation and Review of Other
Postemployment Benefits (OPEB) as of
June 30, 2016 in accordance with GASB
Statements No. 43 and No. 45**





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January 6, 2017

*Mr. Michael DiPietro
Comptroller
333 Washington Street
Town Hall
Brookline, MA 02445*

Dear Mr. DiPietro:

We are pleased to submit this report on our actuarial valuation of postemployment welfare benefits as of June 30, 2016 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 fiscal year beginning July 1, 2016 and summarizes the actuarial data.

This report is based on information received from the Town of Brookline. 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.

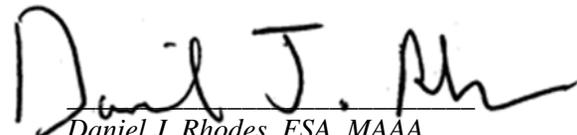
Sincerely,

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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SECTION 1

EXECUTIVE SUMMARY

Important Information About Actuarial Valuations	1
Purpose	3
Highlights of the Valuation	3
Key Valuation Results	5
Accounting Requirements	6

SECTION 2

VALUATION RESULTS

Summary of Valuation Results	9
Funding Schedule	10
10-Year Projection of ARC Using Partial Funding Assumptions	11
Department Results	12
Actuarial Certification	14

SECTION 3

VALUATION DETAILS

CHART 1 Required Supplementary Information – Schedule of Employer Contributions	16
CHART 2 Required Supplementary Information – Schedule of Funding Progress	17
CHART 3 Required Supplementary Information – Net OPEB Obligation/(Asset) (NOO/NOA)	18
CHART 4 Summary of Required Supplementary Information	19

SECTION 4

SUPPORTING INFORMATION

EXHIBIT I Summary of Participant Data ...	20
EXHIBIT II Actuarial Assumptions and Actuarial Cost Method	21
EXHIBIT III Summary of Plan	33

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 Town of Brookline 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 Town of Brookline. 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, 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 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

SECTION 1: Executive Summary for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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 Town of Brookline. 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 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, 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 Town of Brookline 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 Town of Brookline upon delivery and review. The Town of Brookline 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.

SECTION 1: Executive Summary for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

PURPOSE

This report presents the results of our actuarial valuation of the Town of Brookline (the “Employer”) postemployment welfare benefit plan as of June 30, 2016. 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, 2017, we project the Town will pay benefits (net of retiree contributions) on behalf of retired employees of about \$11,483,000. This amount is less than the annual “cost” (the “Annual Required Contribution,” or ARC) of approximately \$23,747,000.

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.

To be considered a fully funded plan, the “contribution in relation to the ARC” must equal the ARC. For example, if the ARC calculated at the funded discount rate of 7.40% is \$20,434,000 and the employer pays benefits to retirees of \$11,483,000, then an additional contribution of the difference, or approximately \$8,952,000 will need to be added to an OPEB trust fund during the fiscal year ending June 30, 2017. The Town has budgeted \$3.5 million in fiscal 2017, \$3.6 million in fiscal 2018, \$3.8 million in fiscal 2019, \$4.1 million in fiscal 2020, increasing by \$250,000 annually until fiscal 2025, then increasing at \$125,000 annually thereafter.

For the purpose of this valuation, we have used a partially funded discount rate of 6.15%. The blended assumption was based on a full funding discount rate of 7.40% and a pay-as-you-go discount rate of 4.50%. In the prior valuation, the partially funded discount rate of 7.0% was based on a full funding 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), with payments increasing at 4.0% per 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.”

SECTION 1: Executive Summary for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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.

As of June 20, 2016, assets held in an irrevocable trust total \$30,016,389. Assets have increased by \$7,642,888 from the June 30, 2014 value of \$22,373,501 as shown below:

Reconciliation of OPEB Trust Fund

	Total
Balance as of June 30, 2014	\$22,373,501
Fiscal year 2015 OPEB contributions	3,311,860
Net investment income	<u>371,563</u>
Balance as of June 30, 2015	\$26,056,924
Fiscal year 2016 OPEB contributions	3,499,119
Net investment income	<u>460,346</u>
Balance as of June 30, 2016	\$30,016,389

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.

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.

The employer contribution shown in Charts 1 and 3 on pages 16 and 18 should reflect projected benefit payments and OPEB Trust contributions. The table below shows the breakdown of projected benefit payments and OPEB trust contributions for fiscal year 2017. Please note that these charts will need to be revised if actual OPEB contributions differ from the amounts shown in the table below.

OPEB Contributions

	Projected Benefit Payments	OPEB Contributions	Total
Fiscal year 2017	\$11,482,521	\$3,545,659	\$15,028,180

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.

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.

SECTION 1: Executive Summary for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

KEY VALUATION RESULTS

- The **unfunded actuarial accrued liability (UAAL)** as of June 30, 2016 is \$280,723,000 based on an actuarial accrued liability of \$310,739,000, using the partially funded discount rate of 6.15%, and an actuarial value of assets of \$30,016,000. 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 expected benefit payments made by the Employer and contributions to the Trust. Future valuations will analyze the difference between actual and expected unfunded actuarial accrued liabilities.
 - As of June 30, 2016 the ratio of assets to the AAL (the funded ratio) is 9.66%.
- The **Annual Required Contribution (ARC)** for fiscal year 2017 is \$23,747,000. 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 \$280,723,000 as of June 30, 2016 represents an increase of \$82,378,000 from the \$198,345,000 unfunded liability as shown in the June 20, 2014 valuation.

The unfunded liability had been expected to increase \$13,701,000 due to normal plan operations, which consist of continuing accruals for active members, plus interest on the unfunded obligation, less contributions. The increase was the net effect of the following:

- An **actuarial experience loss** increased obligations by \$16,891,000. This was the net result of gains and losses due to demographic changes, investment loss and contributions less than expected.
- **Valuation assumption and plan changes** increased obligations by \$51,786,000. This was the net result of an *increase* in obligations due to 1) lowering the partial funding discount rate from 7.00% to 6.15%, 2) changes in demographic assumptions as described in Exhibit II, Section 4, 3) revising the future trend on medical/prescription drug costs and 4) revising the excise tax on high cost health plans beginning in 2020, partially offset by a *decrease* in obligations due to 5) valuation year per capita health costs not increasing as much as projected. The complete set of assumptions is shown in Exhibit II.

PROJECTIONS

Following the Summary of the Valuation Results is a Funding Schedule for the Town that projects the additional funding requirements needed over the next 30 years to fully fund these obligations based on the funding discount rate of 7.40%. We have also included a ten-year projection of the ARC based on the partial funding discount rate of 6.15%. However, revised liability calculations will be needed when GASB Statement No. 75 is effective in fiscal 2018.

SECTION 1: Executive Summary for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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.

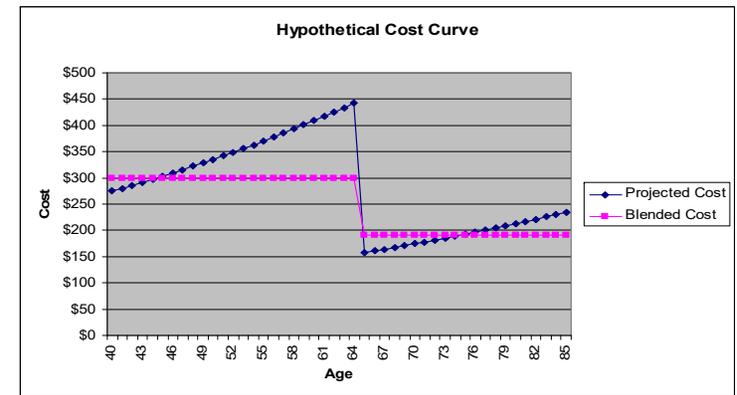
The statements cover postemployment benefits of health, prescription drug, dental, vision and life insurance coverage for retirees; long-term care coverage, life insurance and death benefits that are *not* offered as part of a pension plan; and long-term disability insurance for employees. These benefits, 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.

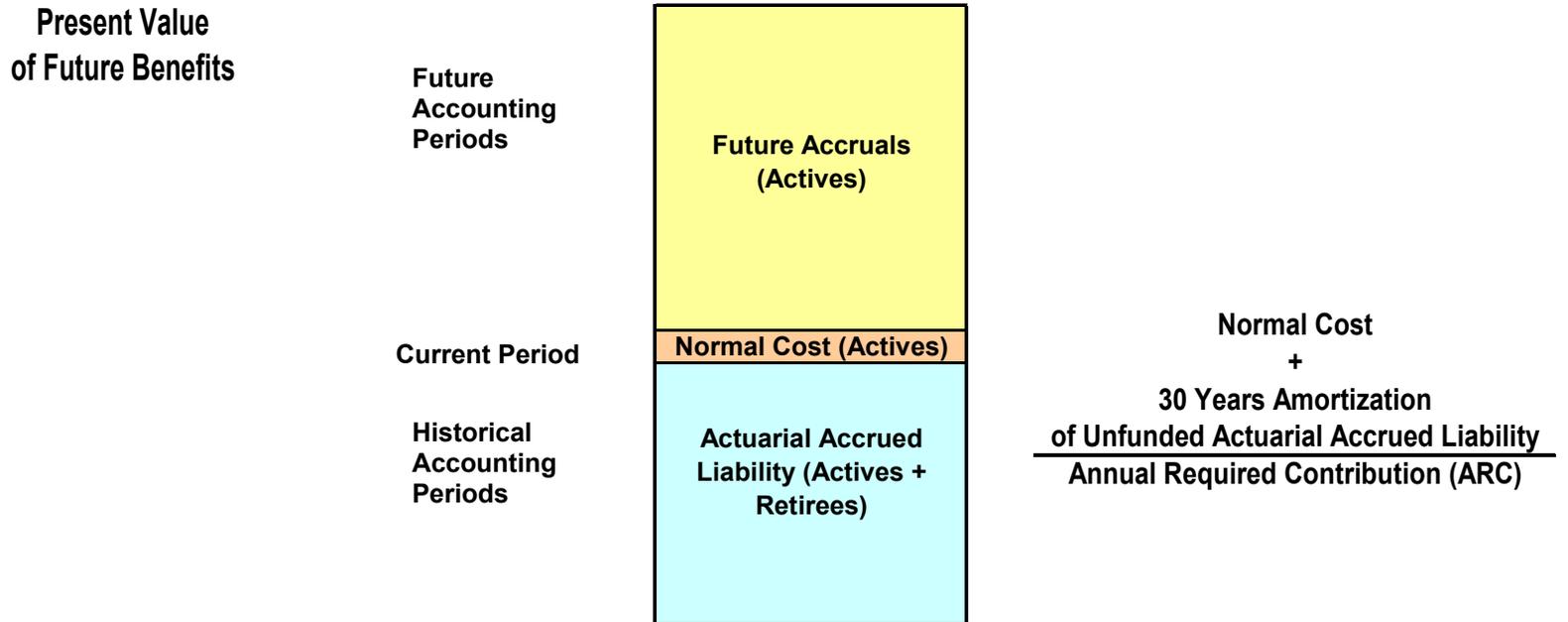


SECTION 1: Executive Summary for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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



$$\text{Net OPEB Obligation} = \text{ARC}_1 + \text{ARC}_2 + \text{ARC}_3 + \dots - \text{Contribution}_1 - \text{Contribution}_2 - \text{Contribution}_3 - \dots$$

SECTION 1: Executive Summary for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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.

SECTION 2: Valuation Results for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

**SUMMARY OF VALUATION RESULTS
ALL DEPARTMENTS**

The key results for the current year are shown on a funded basis and a partially funded basis.

	Funding (7.40% discount rate)	Partial Funding (6.15% discount rate)
Actuarial Accrued Liability (AAL) by Participant Category		
1. Current retirees, beneficiaries and dependents	\$146,190,082	\$165,794,213
2. Current active members	<u>113,824,307</u>	<u>144,945,220</u>
3. Total AAL as of June 30, 2016: (1) + (2)	\$260,014,388	\$310,739,433
4. Actuarial value of assets as of June 30, 2016	<u>30,016,389</u>	<u>30,016,389</u>
5. Unfunded actuarial accrued liability (UAAL) as of June 30, 2016: (3) – (4)	\$229,997,999	\$280,723,044
Annual Required Contribution for Fiscal Year Ending June 30, 2017		
6. Normal cost as of July 1, 2016	\$7,955,787	\$10,654,649
7. Adjustment for timing	<u>289,110</u>	<u>322,744</u>
8. Normal cost adjusted for timing: (6) + (7)	\$8,244,897	\$10,977,393
9. 30-year increasing amortization (increasing 4.0% per year) of the UAAL as of July 1, 2016	11,761,841	12,394,334
10. Adjustment for timing	<u>427,423</u>	<u>375,441</u>
11. Amortization payment adjusted for timing: (9) + (10)	\$12,189,264	\$12,769,775
12. Total Annual Required Contribution (ARC): (8) + (11)	20,434,161	23,747,168
13. Projected benefit payments	<u>11,482,521</u>	<u>11,482,521</u>
14. Funding shortfall: (12) – (13)	\$8,951,640	\$12,264,647
15. Expected Town contribution	3,545,659	3,545,659

Note: Assumes payment in the middle of the fiscal year.

SECTION 2: Valuation Results for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

FUNDING SCHEDULE

30 Years Closed (7.40% discount rate), payments increasing at 4.0%

Fiscal Year Ended June 30	(1) Projected Benefit Payments	(2) Normal Cost	(3) Amortization of UAAL	(4) Total Funding Requirement (3) + (2)	(5) Additional Funding (4) - (1)	At Fiscal Year End		
						(6) Assets	(7) AAL	(8) UAAL (7) - (6)
2017	\$11,482,521	\$8,244,897	\$12,189,264	\$20,434,161	\$8,951,640	\$41,514,542	\$275,900,174	\$234,385,632
2018	12,699,731	8,657,142	12,676,833	21,333,975	8,634,244	53,534,628	292,127,291	238,592,663
2019	13,899,848	9,089,999	13,183,906	22,273,905	8,374,057	66,174,558	308,760,073	242,585,515
2020	15,415,558	9,544,499	13,711,262	23,255,761	7,840,203	79,196,589	325,523,907	246,327,318
2021	16,604,956	10,021,724	14,259,712	24,281,436	7,676,480	93,012,578	342,790,211	249,777,633
2022	17,703,402	10,522,810	14,830,100	25,352,910	7,649,508	107,822,998	360,715,154	252,892,156
2023	18,895,490	11,048,951	15,423,304	26,472,255	7,576,765	123,654,002	379,276,395	255,622,393
2024	19,967,467	11,601,399	16,040,236	27,641,635	7,674,168	140,757,443	398,672,760	257,915,317
2025	21,032,881	12,181,469	16,681,845	28,863,314	7,830,433	159,288,482	419,001,474	259,712,992
2026	22,121,691	12,790,542	17,349,119	30,139,661	8,017,970	179,385,170	440,337,343	260,952,173
2027	23,186,454	13,430,069	18,043,084	31,473,153	8,286,699	201,247,508	462,811,377	261,563,869
2028	24,345,777	14,101,572	18,764,807	32,866,379	8,520,602	224,970,062	486,442,942	261,472,880
2029	25,563,066	14,806,651	19,515,399	34,322,050	8,758,984	250,695,130	511,292,420	260,597,290
2030	26,841,219	15,546,984	20,296,015	35,842,999	9,001,780	278,575,472	537,423,395	258,847,923
2031	28,183,280	16,324,333	21,107,856	37,432,189	9,248,909	308,775,069	564,902,829	256,127,760
2032	29,592,444	17,140,550	21,952,170	39,092,720	9,500,276	341,469,937	593,801,246	252,331,309
2033	31,072,066	17,997,578	22,830,257	40,827,835	9,755,769	376,849,003	624,192,927	247,343,924
2034	32,625,670	18,897,457	23,743,467	42,640,924	10,015,254	415,115,035	656,156,111	241,041,076
2035	34,256,953	19,842,330	24,693,206	44,535,536	10,278,583	456,485,651	689,773,217	233,287,566
2036	35,969,801	20,834,447	25,680,934	46,515,381	10,545,580	501,194,393	725,131,067	223,936,674
2037	37,768,291	21,876,169	26,708,171	48,584,340	10,816,049	549,491,879	762,321,129	212,829,250
2038	39,656,706	22,969,977	27,776,498	50,746,475	11,089,769	601,647,046	801,439,773	199,792,727
2039	41,639,541	24,118,476	28,887,558	53,006,034	11,366,493	657,948,475	842,588,541	184,640,066
2040	43,721,518	25,324,400	30,043,060	55,367,460	11,645,942	718,705,814	885,874,429	167,168,615
2041	45,907,594	26,590,620	31,244,782	57,835,402	11,927,808	784,251,305	931,410,189	147,158,884
2042	48,202,973	27,920,151	32,494,573	60,414,724	12,211,751	854,941,424	979,314,649	124,373,225
2043	50,613,122	29,316,159	33,794,356	63,110,515	12,497,393	931,158,634	1,029,713,045	98,554,411
2044	53,143,778	30,781,967	35,146,130	65,928,097	12,784,319	1,013,313,270	1,082,737,378	69,424,108
2045	55,800,967	32,321,065	36,551,975	68,873,040	13,072,073	1,101,845,560	1,138,526,789	36,681,229
2046	58,591,015	33,937,118	38,014,054	71,951,172	13,360,157	1,197,227,793	1,197,227,793	-

Notes: Assumes payment in the middle 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.

Amortization payments calculated to increase 4.0% per year.

Assets are assumed to return 7.40% per year.

SECTION 2: Valuation Results for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

10-YEAR PROJECTION OF ARC USING PARTIAL FUNDING ASSUMPTIONS

30 Years Open (6.15% discount rate)

Fiscal Year Ended June 30	(1) Projected Benefit Payments	(2) Normal Cost	(3) Amortization of UAAL	(4) ARC (3) + (2)	(5) Expected Town Contribution	At Fiscal Year End		
						(6) Assets	(7) AAL	(8) UAAL (7) – (6)
2017	\$11,482,521	\$10,977,393	\$12,769,775	\$23,747,168	\$3,545,659	\$35,912,109	\$329,329,480	\$293,417,371
2018	12,699,731	11,526,263	13,347,224	24,873,487	3,595,659	42,295,929	348,374,229	306,078,300
2019	13,899,848	12,102,576	13,923,155	26,025,731	3,845,659	49,411,237	367,947,531	318,536,294
2020	15,415,558	12,707,705	14,489,855	27,197,560	4,095,659	57,312,163	387,786,427	330,474,264
2021	16,604,956	13,343,090	15,032,900	28,375,990	4,345,659	66,056,842	408,274,620	342,217,778
2022	17,703,402	14,010,245	15,567,099	29,577,344	4,595,659	75,707,712	429,578,482	353,870,770
2023	18,895,490	14,710,757	16,097,180	30,807,937	4,845,659	86,331,832	451,686,065	365,354,233
2024	19,967,467	15,446,295	16,619,550	32,065,845	5,095,659	98,001,221	474,806,634	376,805,413
2025	21,032,881	16,218,610	17,140,451	33,359,061	5,345,659	110,793,230	499,047,141	388,253,911
2026	22,121,691	17,029,541	17,661,230	34,690,771	5,470,659	124,661,390	524,492,143	399,830,753

Notes: Assumes payment in the middle 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.

Amortization payments calculated to increase 4.0% per year

Assets are assumed to return 7.40% per year.

SECTION 2: Valuation Results for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

DEPARTMENT RESULTS

Actuarial Accrued Liability (AAL) and Annual Required Contribution – Partial Funding 6.15%

	School Enterprise Funds				
	School	Adult Education	Early Childhood	Food Services	Metco
Actuarial Accrued Liability by Participant Category					
1. Current retirees, beneficiaries and dependents	\$72,562,341	\$99,251	\$768,815	\$926,418	\$132,566
2. Current active members	<u>63,477,520</u>	<u>485,933</u>	<u>3,176,211</u>	<u>2,243,043</u>	<u>1,104,375</u>
3. Total AAL as of June 30, 2016: (1) + (2)	\$136,039,861	\$585,184	\$3,945,026	\$3,169,461	\$1,236,942
4. Actuarial value of assets as of June 30, 2016	<u>8,804,456</u>	<u>86,068</u>	<u>601,497</u>	<u>616,944</u>	<u>201,018</u>
5. Unfunded actuarial accrued liability (UAAL) as of June 30, 2016: (3) – (4)	\$127,235,405	\$499,116	\$3,343,529	\$2,552,518	\$1,035,924
Annual Required Contribution for Fiscal Year Ending June 30, 2017					
6. Normal cost as of July 1, 2016	\$5,332,512	\$43,731	\$244,945	\$162,897	\$59,934
7. Adjustment for timing	<u>161,528</u>	<u>1,325</u>	<u>7,420</u>	<u>4,934</u>	<u>1,815</u>
8. Normal cost adjusted for timing: (6) + (7)	\$5,494,040	\$45,056	\$252,365	\$167,831	\$61,749
9. 30-year increasing amortization (increasing 4.0% per year) of the UAAL as of July 1, 2016	\$5,617,629	\$22,037	\$147,622	\$112,697	\$45,738
10. Adjustment for timing	<u>170,165</u>	<u>668</u>	<u>4,472</u>	<u>3,414</u>	<u>1,385</u>
11. Amortization payment adjusted for timing: (9) + (10)	\$5,787,794	\$22,705	\$152,094	\$116,111	\$47,123
12. Total Annual Required Contribution (ARC): (8) + (11)	\$11,281,834	\$67,761	\$404,459	\$283,942	\$108,872
13. Projected benefit payments	<u>5,121,076</u>	<u>5,135</u>	<u>54,938</u>	<u>77,696</u>	<u>17,897</u>
14. Funding shortfall: (12) – (13)	\$6,160,758	\$62,626	\$349,521	\$206,246	\$90,975
15. Expected Town contribution	947,000	16,687	113,722	95,982	36,609

Notes: Assumes payment in the middle of the fiscal year.

The asset allocation as of June 30, 2014 was updated to reflect contribution amounts provided by the Town and investment income allocated in proportion to average assets. For School Enterprise Funds, contributions were allocated in proportion to actuarial accrued liability.

SECTION 2: Valuation Results for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Actuarial Accrued Liability (AAL) and Annual Required Contribution – Partial Funding 6.15%

	Enterprise Funds						
	Golf	Recreation	Water	Town	CDBG	Retirement	Total
Actuarial Accrued Liability by Participant Category							
1. Current retirees, beneficiaries and dependents	\$0	\$1,398,878	\$4,637,620	\$85,190,706	\$0	\$77,617	\$165,794,213
2. Current active members	<u>99,285</u>	<u>1,139,895</u>	<u>3,053,100</u>	<u>69,778,712</u>	<u>190,892</u>	<u>196,255</u>	<u>144,945,220</u>
3. Total AAL as of June 30, 2016: (1) + (2)	\$99,285	\$2,538,772	\$7,690,720	\$154,969,419	\$190,892	\$273,872	\$310,739,433
4. Actuarial value of assets as of June 30, 2016	<u>66,261</u>	<u>732,899</u>	<u>1,700,328</u>	<u>16,678,175</u>	<u>199,251</u>	<u>329,492</u>	<u>30,016,389</u>
5. Unfunded actuarial accrued liability (UAAL) as of June 30, 2016: (3) – (4)	\$33,023	\$1,805,873	\$5,990,392	\$138,291,244	(\$8,359)	(\$55,621)	\$280,723,044
Annual Required Contribution for Fiscal Year Ending June 30, 2017							
6. Normal cost as of July 1, 2016	\$10,916	\$91,936	\$176,274	\$4,507,298	\$3,686	\$20,521	\$10,654,649
7. Adjustment for timing	<u>331</u>	<u>2,785</u>	<u>5,340</u>	<u>136,532</u>	<u>112</u>	<u>622</u>	<u>322,744</u>
8. Normal cost adjusted for timing: (6) + (7)	\$11,247	\$94,721	\$181,614	\$4,643,830	\$3,798	\$21,143	\$10,977,393
9. 30-year increasing amortization (increasing 4.0% per year) of the UAAL as of July 1, 2016	\$1,458	\$79,732	\$264,485	\$6,105,761	(\$369)	(\$2,456)	\$12,394,334
10. Adjustment for timing	<u>44</u>	<u>2,415</u>	<u>8,012</u>	<u>184,951</u>	<u>(11)</u>	<u>(74)</u>	<u>375,441</u>
11. Amortization payment adjusted for timing: (9) + (10)	\$1,502	\$82,147	\$272,497	\$6,290,712	(\$380)	(\$2,530)	\$12,769,775
12. Total Annual Required Contribution (ARC): (8) + (11)	\$12,749	\$176,868	\$454,111	\$10,934,542	\$3,418	18,613	23,747,168
13. Projected benefit payments	<u>49</u>	<u>93,063</u>	<u>305,188</u>	<u>5,800,479</u>	<u>2,407</u>	<u>4,593</u>	<u>11,482,521</u>
14. Funding shortfall: (12) – (13)	\$12,700	\$83,805	\$148,923	\$5,134,063	\$1,011	\$14,020	\$12,264,647
15. Expected Town contribution	7,315	40,261	74,991	2,213,092	0	0	3,545,659

Notes: Assumes payment in the middle of the fiscal year.

The asset allocation as of June 30, 2014 was updated to reflect contribution amounts provided by the Town and investment income allocated in proportion to average assets. For School Enterprise Funds, contributions were allocated in proportion to actuarial accrued liability.

SECTION 2: Valuation Results for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

January 6, 2017

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 Town of Brookline other postemployment benefit programs as of June 30, 2016, 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.

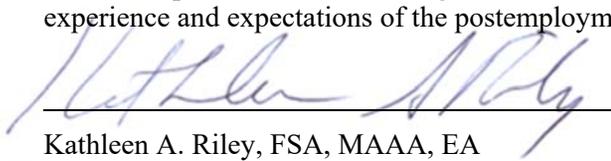
The actuarial valuation is based on the plan of benefits verified by the Town and on participant and premium data and financial information provided by the Town or from vendors employed by the Town. Segal Consulting does not audit the data provided. The accuracy and comprehensiveness of the data is the 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.

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. The scope of the assignment did not include performing an analysis of the potential range of such future measurements.

SECTION 2: Valuation Results for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

The signing actuaries 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, 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. Further, in our opinion, the assumptions 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

SECTION 3: Valuation Details for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

CHART 1
Required Supplementary Information – Schedule of Employer Contributions

Fiscal Year Ended June 30,	Annual OPEB Costs	Actual Contributions	Percentage Contributed
2008	\$21,528,296	\$6,217,209	28.9%
2009	20,503,147	9,532,102	46.5%
2010	21,792,668	10,522,409	48.3%
2011	15,562,334	18,398,444	118.2%
2012	16,268,331	11,655,515	71.6%
2013	17,094,395	12,278,875	71.8%
2014	17,909,220	13,990,280	78.1%
2015	18,055,248	13,256,526	73.4%
2016	18,877,059	14,362,586	77.9%
2017	24,665,835	15,028,180	60.9%

Note: Fiscal 2017 includes OPEB Trust contribution of \$3,545,659.

SECTION 3: Valuation Details for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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

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)]
06/30/2006	\$0	\$325,834,939	\$325,834,939	0.00%	\$115,000,000	283.33%
06/30/2008	0	323,225,372	323,225,372	0.00%	120,097,413	269.14%
06/30/2010	7,355,050	215,241,652	207,886,602	3.42%	124,608,849	166.83%
06/30/2012	12,766,296	202,733,897	189,967,601	6.30%	128,628,216	147.69%
06/30/2014	22,373,501	220,718,530	198,345,029	11.28%	142,177,301	--
06/30/2016	30,016,389	310,739,433	280,723,044	9.66%	--	--

* Enter covered payroll for fiscal 2016.

SECTION 3: Valuation Details for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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

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	\$21,528,296	\$0	\$0	\$21,528,296	\$6,217,209	\$15,311,087	\$15,311,087
2009	20,503,147	0	0	20,503,147	9,532,102	10,971,045	26,282,132
2010	21,473,717	1,389,499	(1,070,548)	21,792,668	10,522,409	11,270,259	37,552,391
2011	14,945,299	2,189,307	(1,572,272)	15,562,334	18,398,444	(2,836,110)	34,716,281
2012	15,558,958	2,516,930	(1,807,557)	16,268,331	11,655,515	4,612,816	39,329,097
2013	16,290,766	2,851,360	(2,047,731)	17,094,395	12,278,875	4,815,520	44,144,616
2014	17,007,193	3,200,485	(2,298,458)	17,909,220	13,990,280	3,918,940	48,063,557
2015	17,119,593	3,364,449	(2,428,794)	18,055,248	13,256,526	4,798,722	52,862,279
2016	17,847,987	3,700,360	(2,671,288)	18,877,059	14,362,586	4,514,473	57,376,752
2017	23,747,168	3,528,670	(2,610,003)	24,665,835	15,028,180	9,637,655	67,014,407

Note: Fiscal 2017 includes OPEB Trust contribution of \$3,545,659.

SECTION 3: Valuation Details for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

**CHART 4
Summary of Required Supplementary Information**

Valuation date	June 30, 2016
Actuarial cost method	Projected Unit Credit
Amortization method	Payments increasing at 4.0% per year
Remaining amortization period	30 years open
Asset valuation method	Market value
Actuarial assumptions:	
Investment rate of return	6.15% (partially funded)
Asset rate of return	7.40%
Inflation rate	4.00%
Medical/drug cost trend rate	8.50% decreasing by 0.50% for 7 years to an ultimate level of 5.00% per year
Plan membership:	
Current retirees, beneficiaries, and dependents*	1,666
Current active participants	<u>1,525</u>
Total	3,191

* Includes 12 retirees with life insurance only.

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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

**EXHIBIT I
Summary of Participant Data**

	July 1, 2016	July 1, 2014
Active employees covered for medical benefits*		
Number of employees		
Male	632	580
Female	<u>893</u>	<u>730</u>
Total	1,525	1,310
Average age	43.6	44.5
Average service	11.0	12.0
Retired employees, spouses and beneficiaries covered for medical benefits		
Number of individuals	1,654	1,652
Average age	73.1	72.7
Retired employees eligible for life insurance		
Number of individuals*	857	947
Average age	73.2	73.2

** July 1, 2016 and July 1, 2014 counts include 12 and 54 retirees with life insurance only, respectively.*

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

**EXHIBIT II
Actuarial Assumptions and Actuarial Cost Method**

Data:	Detailed census data, premium rates, and summary plan descriptions for postemployment welfare benefits were provided by the Town of Brookline.
Actuarial Cost Method:	Projected Unit Credit - For active employees, benefits are allocated from date of hire to assumed retirement age.
Per Capita Cost Development:	Per capita claims costs were based on the fully-insured premium rates effective July 1, 2016 (January 1, 2016 for the Medicare Advantage Plans) offered by the Group Insurance Commission. Premiums were combined by taking a weighted average based on the number of participants in each plan and were then 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.
Measurement Date:	June 30, 2016 The results of the June 30, 2016 actuarial valuation were used to determine the Annual Required Contribution for the fiscal years ending June 30, 2017.
Expected Return Assets:	7.40% Long-term rate of return on a diversified portfolio invested primarily in the PRIT Fund. The expected return of the PRIT Fund 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:	6.15% (partially funded discount rate is based on a funded discount rate of 7.40% and a pay-as-you-go discount rate of 4.50%) (previously, 7.0% partially funded discount rate is based on a funded discount rate of 7.50% and a pay-as-you-go discount rate of 4.50%).
Asset Valuation Method:	Market Value

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Mortality Rates:

<i>Pre-Retirement (Non-Teachers)</i>	RP-2000 Healthy Employee Mortality Table projected generationally with Scale BB2D from 2009 (previously, RP-2000 Healthy Employee Mortality Table projected generationally with Scale AA from 2010).
<i>Healthy (Non-Teachers)</i>	RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2009 (previously, RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale AA from 2010)
<i>Disabled (Non-Teachers)</i>	RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2015 (previously, RP-2000 Healthy Annuitant Mortality Table set forward 2 years projected generationally with Scale AA from 2010)
<i>Pre-Retirement (Teachers)</i>	RP-2014 Employee Mortality Table projected generationally with Scale BB2D from 2014 (previously, RP-2000 Combined Healthy White Collar Table projected 22 years with Scale AA)
<i>Healthy (Teachers)</i>	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 17 years with Scale AA)
<i>Disabled (Teachers)</i>	RP-2014 Healthy Annuitant Mortality Table set forward 4 years projected generationally with Scale BB2D from 2014 (previously, RP-2000 Healthy Annuitant with Large Benefit Amount Adjustment Mortality Table projected 7 years with Scale AA set forward 3 years for males)

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.

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Non-Teacher Annuitant Mortality Rates:

Age	Rate per year (%)	
	Male	Female
60	0.82	0.62
70	2.22	1.67
80	6.44	4.59
90	18.34	13.17

Note: Mortality rates shown are before generational projection.

Teacher Annuitant Mortality Rates:

Age	Rate per year (%)			
	Current		Previously	
	Male	Female	Male	Female
60	0.78	0.52	0.50	0.48
70	1.68	1.29	1.29	1.30
80	4.47	3.48	4.30	3.80
90	13.59	10.17	14.25	10.75

Note: Mortality rates shown are before generational projection.

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Termination Rates before Retirement:

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

Age	Mortality		
	Male	Female	Disability
20	0.03	0.02	0.01
25	0.04	0.02	0.02
30	0.04	0.03	0.03
35	0.08	0.05	0.06
40	0.11	0.07	0.20
45	0.15	0.11	0.29
50	0.21	0.17	0.58
55	0.30	0.25	0.71
60	0.49	0.40	0.84

*Notes: Mortality rates shown are before generational projection.
55% of the rates shown represent accidental disability and death.*

Group 4 – Rate per year (%)

Age	Mortality		
	Male	Female	Disability
20	0.03	0.02	0.10
25	0.04	0.02	0.20
30	0.04	0.03	0.30
35	0.08	0.05	0.30
40	0.11	0.07	0.60
45	0.15	0.11	2.00
50	0.21	0.17	3.75
55	0.30	0.25	3.60
60	0.49	0.40	2.55

*Notes: Mortality rates shown are before generational projection.
90% of the rates shown represent accidental disability and death.*

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Teachers - Rate per year (%)

Mortality

Age	Current		Previously		Disability
	Male	Female	Male	Female	
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	0.01	0.01
35	0.05	0.03	0.05	0.04	0.01
40	0.06	0.04	0.07	0.05	0.01
45	0.10	0.07	0.10	0.07	0.03
50	0.17	0.11	0.13	0.10	0.05
55	0.28	0.17	0.22	0.22	0.07
60	0.47	0.24	0.39	0.42	0.07

*Notes: Mortality rates shown are before generational projection.
 35% of the rates shown represent accidental disability.
 55% of the death rates shown represent accidental death.*

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Withdrawal Rates:

		Rate per year (%)		
Years of Service	Groups 1 and 2 (excluding Teachers)		Years of Service	Group 4
	0	15.0		
1	12.0	11+	0.0	
2	10.0			
3	9.0			
4	8.0			
5 – 9	7.6			
10 – 14	5.4			
15 – 19	3.3			
20 – 24	2.0			
25 – 29	1.0			
30+	0.0			

Withdrawal Rates:

		Teachers - Rate per year (%)				
Age	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

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Retirement Rates:

Age	Rate per year (%)	
	Groups 1 and 2 (excluding Teachers)	Group 4
55	5.0	15.0
56 – 58	2.5	10.0
59	2.5	15.0
60	10.0	20.0
61	15.0	20.0
62 - 63	10.0	25.0
64	10.0	30.0
65	40.0	100.0
66 - 67	25.0	--
68 - 69	30.0	--
70	100.0	--

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Age	Teachers - Rate per year (%)					
	Years of Service					
	Less than 20		20 – 29		30 or more	
	Male	Female	Male	Female	Male	Female
50 - 52	--	--	1.0	1.0	2.0	1.5
53	--	--	1.5	1.0	2.0	1.5
54	--	--	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	30.0	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, 65% were assumed to have an eligible spouse who also opts for health coverage at that time.

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

Per Capita Health Costs:

Fiscal 2016 - 2017 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				Medicare Plans			
	Retiree		Spouse		Retiree		Spouse	
	Male	Female	Male	Female	Male	Female	Male	Female
45	\$7,944	\$9,965	\$4,927	\$7,439	N/A	N/A	N/A	N/A
50	9,428	10,739	6,586	8,623	N/A	N/A	N/A	N/A
55	11,197	11,560	8,812	9,981	N/A	N/A	N/A	N/A
60	13,298	12,461	11,797	11,576	N/A	N/A	N/A	N/A
65	15,793	13,424	15,793	13,424	\$4,477	\$3,805	\$4,477	\$3,805
70	18,304	14,466	18,304	14,466	5,189	4,101	5,189	4,101
75	19,725	15,572	19,725	15,572	5,592	4,414	5,592	4,414
80	21,242	16,788	21,242	16,788	6,022	4,759	6,022	4,759

Medicare Advantage Plan: \$3,416

Weighted Average Annual Retiree Contribution Amount:

Non-Medicare: \$1,712

Medicare: \$823

Medicare Advantage: \$581

Annual Medicare Part B Reimbursement:

\$850 (portion paid by Town)

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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	Medical/ Prescription Drug	Medicare Part B Premium
2017	8.5%	5.0%
2018	8.0%	5.0%
2019	7.5%	5.0%
2020	7.0%	5.0%
2021	6.5%	5.0%
2022	6.0%	5.0%
2023	5.5%	5.0%
2024	5.0%	5.0%

The medical/prescription drug trend assumption is the same as used in the Commonwealth of Massachusetts Postemployment Benefit Other than Pensions Actuarial Valuation as of January 1, 2016, dated October 24, 2016.

Retiree Contribution Increase Rate:

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

Participation and Coverage Election:

100% of active employees with coverage are assumed to elect retiree coverage. We have loaded active liabilities by 20% to account for current employees who have waived health coverage but are expected to receive coverage through the Town as retirees.

100% of retirees over age 65 are assumed to remain in their current medical plan for life.

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

For future retirees hired before 1986 and current retirees under age 65, 93% are assumed to be eligible for Medicare and are assumed to enroll in a Medicare indemnity plan upon reaching age 65, 2% are assumed to enroll in a Medicare HMO plan and 5% are assumed to be ineligible for Medicare and to remain enrolled in a non-Medicare indemnity plan.

For future over-65 retirees hired in 1986 or later, 98% are assumed to enroll in a Medicare indemnity plan and 2% are assumed to enroll in a Medicare HMO plan.

Life insurance elections were available for current retirees. 100% of future retirees with medical coverage are assumed to have life insurance coverage.

Plan Design:	Development of plan liabilities was based on the substantive plan of benefits in effect as described in Exhibit III.
Administrative Expenses:	Administrative expenses for insured plans were assumed to be included in the fully insured premium rates.
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 (reflected with this valuation) and those previously adopted as of the valuation date. The revised excise tax in this valuation increases the actuarial accrued liability by 0.5% and the normal cost by 1.13%.
Rationale for Demographic Assumptions:	<p>Many of the demographic assumptions used in this valuation (including mortality, disability, turnover and retirement) are the same as used in the Town of Brookline Contributory Retirement System Actuarial Valuation and Review as of January 1, 2016, dated July 14, 2016 completed by Segal Consulting and the Massachusetts Teachers' Retirement System Actuarial Valuation Report as of January 1, 2016, dated October 13, 2016 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>

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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.

Justification for Assumption Changes Since Prior Valuation:

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

- The per capita health costs were updated.
- The mortality assumptions were changed to match the assumptions used in the Town of Brookline Contributory Retirement System Actuarial Valuation and Review as of January 1, 2016 dated July 14, 2016, and the Massachusetts Teachers' Retirement System Actuarial Valuation Report as of January 1, 2016, dated October 13, 2016.
- The medical/prescription drug trend assumption was revised.
- The excise tax on high cost health plans beginning in 2020 was revised with this valuation.
- The fully funded and partially funded discount rates were lowered from 7.5% and 7.0% to 7.4% and 6.15%, respectively.

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 Town of Brookline Contributory Retirement System or Massachusetts Teachers' Retirement System.
<i>Members hired before April 2, 2012</i>	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.
<i>Members hired on or after April 2, 2012</i>	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: 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.

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

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 through a variety of plans offered through the Commonwealth of Massachusetts Group Insurance Commission (GIC). The Town of Brookline also pays 50% of the retiree life insurance premium and a portion of the Medicare Part B premium. (Dental coverage is offered but it is 100% retiree paid and therefore has no impact on this valuation.)
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 retiree dies.
MGL Chapter 32B, Section 18:	Adopted June 2, 1992.
Retiree Contributions:	Premium rates and retiree contributions as of January 1, 2016 and July 1, 2016 are summarized on the following pages:

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

	Subscribers				Monthly Premium (eff. 7/1/2016)	Town cost	Retiree cost	Retiree Cost %
	Active	Retiree	Total	65 and over*				
<u>Non-Medicare Actives and Retirees</u>								
Fallon Direct								
Individual	24	1	25	1	\$519.74	\$431.38	\$88.36	17.0%
Family	7	0	7	0	\$1,247.40	\$1,035.34	\$212.06	17.0%
Fallon Select								
Individual	5	0	5	0	\$690.66	\$573.25	\$117.41	17.0%
Family	18	0	18	0	\$1,657.54	\$1,375.76	\$281.78	17.0%
Harvard Independence								
Individual	164	59	223	25	\$816.43	\$677.64	\$138.79	17.0%
Family	226	36	262	5	\$1,992.07	\$1,653.42	\$338.65	17.0%
Harvard Primary Choice								
Individual	144	10	154	3	\$610.40	\$506.63	\$103.77	17.0%
Family	130	4	134	1	\$1,489.38	\$1,236.19	\$253.19	17.0%
Health New England								
Individual	1	0	1	0	\$534.87	\$443.94	\$90.93	17.0%
Family	1	0	1	0	\$1,326.04	\$1,100.61	\$225.43	17.0%
NHP								
Individual	76	3	79	0	\$512.21	\$425.13	\$87.08	17.0%
Family	43	0	43	0	\$1,357.32	\$1,126.58	\$230.74	17.0%
Tufts Navigator								
Individual	171	23	194	13	\$686.34	\$569.66	\$116.68	17.0%
Family	265	29	294	3	\$1,674.68	\$1,389.98	\$284.70	17.0%
Tufts Spirit								
Individual	40	1	41	0	\$515.32	\$427.72	\$87.60	17.0%
Family	8	0	8	0	\$1,240.52	\$1,029.63	\$210.89	17.0%
Unicare Basic W/CIC								
Individual	0	18	18	9	\$1,002.41	\$651.57	\$350.84	35.0%
Family	7	7	14	1	\$2,346.44	\$1,525.19	\$821.25	35.0%
Unicare Com Choice								
Individual	44	2	46	0	\$487.63	\$404.73	\$82.90	17.0%
Family	43	4	47	1	\$1,170.35	\$971.39	\$198.96	17.0%
Unicare Plus								
Individual	35	17	52	13	\$655.32	\$543.92	\$111.40	17.0%
Family	73	12	85	4	\$1,566.13	\$1,299.89	\$266.24	17.0%
<u>Non-Medicare Total</u>	1525	226	1751	79				

SECTION 4: Supporting Information for the Town of Brookline June 30, 2016 Measurement Under GASB 43 and 45

	Subscribers			Monthly Premium (eff. 7/1/2016)	Town cost	Retiree cost	Retiree Cost %
	Active	Retiree	Total				
<u>Medicare Supplement Plans</u>							
Harvard Pilgrim Medicare Enhance	N/A	299	299	\$439.17	\$364.51	\$74.66	17.0%
Tufts Medicare Complement	N/A	51	51	\$398.39	\$330.66	\$67.73	17.0%
Unicare w/CIC	N/A	378	378	\$374.63	\$310.94	\$63.69	17.0%
<u>Medicare Advantage Plans</u>							
Tufts Medicare Preferred**	N/A	23	23	\$276.46	\$229.46	\$47.00	17.0%
<u>Medicare Total</u>		751	751				
<u>Retiree Total***</u>		977					

* 79 of 830 over-65 retirees are in a non-Medicare plan.
 ** Rates are subject to federal approval and may change January 1, 2017.
 *** In addition, there are 677 spouses of retirees covered under an individual or family policy.

Retiree Life: \$5,000

Plan Changes
Since the Prior Valuation: None.

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