

RatingsDirect®

Summary:

Harwich Town, Massachusetts; General Obligation; Note

Primary Credit Analyst:

Steven E Waldeck, Boston (1) 617-530-8128; steven.waldeck@spglobal.com

Secondary Contact:

Christina Marin, Boston 617-530-8312; christina.marin@spglobal.com

Table Of Contents

Rationale

Outlook

Related Research

Summary:

Harwich Town, Massachusetts; General Obligation; Note

Credit Profile

US\$10.75 mil GO BANs dtd 12/15/2017 due 07/13/2018

<i>Short Term Rating</i>	SP-1+	New
Harwich GO		
<i>Long Term Rating</i>	AA+/Stable	Affirmed

Rationale

S&P Global Ratings assigned its 'SP-1+' short-term rating to Harwich Town, Mass.' series 2017 general obligation (GO) bond anticipation notes (BANs), payable on July 13, 2018, and affirmed its 'AA+' long-term rating, with a stable outlook, on the town's existing GO debt.

The short-term rating reflects our view of the town's very strong capacity to pay principal and interest when the BANs come due. The town maintains a low market-risk profile with strong legal authority to issue long-term debt to take out the BANs, and it is a frequent issuer that regularly provides ongoing disclosure to market participants.

The town's full-faith-and-credit pledge secures the bonds. The town's ability to raise taxes is subject to limitations of Proposition 2 1/2, which has a 2.5% ceiling on total property taxes annually, as well as the 2.5% limit on property tax increases plus the value of new growth. Despite limitations imposed by the commonwealth-levy-limit law, we did not make a rating distinction for the limited-tax-GO pledge due to the town's flexibility under the levy limit. We understand town voters have chosen to exclude the series 2017 BANs from the Proposition 2 1/2 levy limit.

Officials plan to use series 2017 BAN proceeds to fund various capital improvement projects, including marina improvements and boardwalk construction.

The long-term rating reflects our opinion of the town's:

- Very strong economy, with access to a broad and diverse metropolitan statistical area (MSA);
- Strong management, with good financial policies and practices under our Financial Management Assessment (FMA) methodology;
- Strong budgetary performance, with a slight operating surplus in the general fund and an operating surplus at the total-governmental-fund level in fiscal 2016;
- Strong budgetary flexibility, with an available fund balance that we expect will improve in the near term from its fiscal 2016 level of 7.9% of operating expenditures;
- Very strong liquidity, with total government available cash at 31.8% of total-governmental-fund expenditures and 5.7x governmental debt service, and access to external liquidity we consider strong;
- Very strong debt-and-contingent-liability position, with debt service carrying charges at 5.5% of expenditures and net direct debt that is 44.6% of total-governmental-fund revenue, as well as low overall net debt at less than 3% of

market value and rapid amortization, with 65.7% of debt scheduled to be retired within 10 years, but significant medium-term debt plans; and

- Strong institutional framework score.

Very strong economy

We consider Harwich's economy very strong. The town, with an estimated population of 12,304, is in Barnstable County in the Barnstable Town MSA, which we consider broad and diverse. The town has a projected per capita effective buying income of 123% of the national level and per capita market value of \$405,010. Overall, market value grew by 3.5% over the past year to \$5 billion in fiscal 2017. The county unemployment rate was 4.7% in 2016.

Harwich is a residential community on the southeast corner of Cape Cod on Nantucket Sound, about 80 miles from Boston. Due to the substantial number of seasonal second homes, population estimates double in the summer. While Harwich has been evolving into more of a year-round community, its economy continues to depend on second-home owners and summer visitors. Seasonal employment--such as retail trade, accommodations, and food services--accounts for a large portion of the local employment base.

Strong management

We view the town's management as strong, with good financial policies and practices under our FMA methodology, indicating financial practices exist in most areas but that governance officials might not formalize or monitor all of them on a regular basis.

Highlights include management's conservative budget assumptions and regular monitoring of budget performance with monthly reports on budget-to-actual results to the board of selectman and finance committee. The town's free cash policy outlines reserves, free cash, and stabilization funds with the goal of maintaining no less than 7%–8% of general fund expenditures in reserve. The town was not compliant in fiscal 2016, but officials expect to close fiscal 2017 in-line with the reserve policy. There is a strong focus on capital planning, evidenced by Harwich's six-year capital improvement plan that it updates annually and that identifies funding sources. The town also maintains a five-year budget forecast, which it updates annually.

The town adheres to its formal investment-management policy, which mirrors commonwealth guidelines. Harwich maintains a formal debt-management policy that limits general fund debt service to 10%–12% of expenditures.

Strong budgetary performance

Harwich's budgetary performance is strong, in our opinion. The town had slight surplus operating results in the general fund of 0.9% of expenditures and surplus results across all governmental funds of 1.5% of expenditures in fiscal 2016.

Management indicates fiscal 2016 closed with a surplus due to higher-than-budgeted motor vehicle, hotel, and ambulance revenue, along with expenditure turnbacks. Officials expect fiscal 2017 to close with a surplus of about \$900,000 due to higher-than-budgeted local receipts and expenditure turn backs. The fiscal 2018 general fund budget is \$61 million, an increase of 3.2% from fiscal 2017. Management expects operating revenue and expenditures to remain on target.

Property taxes remain the primary revenue source, accounting for about 76% of general fund revenue, followed by intergovernmental receipts at approximately 2.8%. Tax-collection receipts remain consistent for fiscal 2017: They are

continually about 99%. We expect budgetary performance to remain strong.

However, we believe future pension and other-postemployment-benefit (OPEB) costs could become a budgetary pressure due to below-average funding ratios. We note management is actively making adjustments, when needed, for these liabilities. Harwich is funding the actuarially determined contribution, and it has begun prefunding OPEB. We believe these liabilities could strain future operations, particularly if economic or business conditions worsen, if management does not meet actuary assumptions, or if the assumptions are inadequate at current levels.

Strong budgetary flexibility

Harwich's budgetary flexibility is strong, in our view, with an available fund balance we expect could improve in the near term from its fiscal 2016 level of 7.9% of operating expenditures, or \$4.5 million.

Management is projecting fiscal 2017 will close with a surplus of about \$900,000, which will increase available reserves to, what we consider, strong levels. For fiscal 2018, management states that it does not currently have any immediate plans to spend down reserves and that it will work to maintain fund balance at the current level. Therefore, we expect budgetary flexibility to remain strong.

Very strong liquidity

In our opinion, Harwich's liquidity is very strong, with total government available cash at 31.8% of total-governmental-fund expenditures and 5.7x governmental debt service in fiscal 2016. In our view, the town has strong access to external liquidity if necessary.

We believe Harwich's frequent debt issuance, including GO bonds, supports its strong access to external liquidity. The town does not have any liquidity risks from private-placement or direct-purchase obligations. In addition, we do not expect deterioration in the town's liquidity metrics over the next two fiscal years. Therefore, we expect Harwich will likely maintain very strong liquidity.

Very strong debt-and-contingent-liability profile

In our view, Harwich's debt-and-contingent-liability profile is very strong. Total-governmental-fund debt service is 5.5% of total-governmental-fund expenditures, and net direct debt is 44.6% of total-governmental-fund revenue. Overall net debt is low at 1.2% of market value and approximately 65.7% of direct debt is scheduled to be repaid within 10 years, which are, in our view, positive credit factors. Negatively affecting our view of the town's debt profile is its significant medium-term debt plans.

After this issue, Harwich will have \$37.2 million in overall net debt outstanding, \$18 million of which is BANs. Overall net debt includes \$7.9 million in self-supporting water debt. Officials indicate the town could issue an additional \$33.4 million of debt for sewer-system and fire-station construction, as well as road repairs. While the timing and final amounts could vary, based on these plans, we expect Harwich's net direct debt to increase; we have incorporated this into our view of its debt profile.

Harwich's combined required pension and actual OPEB contribution totaled 7.3% of total-governmental-fund expenditures in fiscal 2016. Of that amount, 3.8% represented required contributions to pension obligations and 3.5% represented OPEB payments. The town made its full annual required pension contribution in fiscal 2016.

Harwich contributes to a cost-sharing, multiemployer, defined-benefit plan administered by Barnstable County Contributory Retirement Board. Using updated reporting standards in accordance with Governmental Accounting Standards Board Statement Nos. 67 and 68, the town's proportionate share of the net pension liability was about \$26.6 million with 58% funded at June 30, 2016, based on an assumed rate of return of 7.75%. Due to the funded ratio, we believe contributions will continue to rise over the next few fiscal years. While the town is currently managing these costs, we believe it has a limited ability to control future pension-liability growth.

Harwich also provides postemployment benefits to retirees. Harwich, however, has set up an OPEB trust to prefund the liability, which we view positively. At June 30, 2014, the most recent actuarial valuation, management reported a \$42.4 million OPEB liability. The town has traditionally funded OPEB through pay-as-you-go financing. It paid \$2.1 million, or 3.5% of expenditures, toward OPEB, or 71.7% of the annual required contribution, in fiscal 2016.

The town's OPEB trust currently has a balance of \$841,927. The town is projecting to add about \$100,000 to the trust by fiscal year-end 2018. Officials plan to include an OPEB contribution in the fiscal 2019 budget, which it will fund through the operating budget and the annual appropriation of surplus. While we consider the practice of prefunding the OPEB liability positively, Harwich's large and growing pension and OPEB liabilities could pressure the budget.

Strong institutional framework

The institutional framework score for Massachusetts municipalities is strong.

Outlook

The stable outlook on the long-term rating reflects S&P Global Ratings' opinion of Harwich's very strong economy, supported by strong management with good financial management policies and practices. We do not expect to change the rating during our two-year outlook period due to our expectation that Harwich will likely maintain its strong budgetary performance and flexibility.

Upside scenario

We could raise the rating if Harwich were to take meaningful steps to mitigate pension and OPEB liabilities, coupled with an increase in available reserves to levels we believe would enhance budgetary flexibility.

Downside scenario

Although unlikely during the two-year outlook period, we could lower the rating if budgetary performance and flexibility were to experience significant pressure due to rising pension and OPEB costs.

Related Research

- S&P Public Finance Local GO Criteria: How We Adjust Data For Analytic Consistency, Sept. 12, 2013
- Incorporating GASB 67 And 68: Evaluating Pension/OPEB Obligations Under Standard & Poor's U.S. Local Government GO Criteria, Sept. 2, 2015
- 2017 Update Of Institutional Framework For U.S. Local Governments

Barnstable County

Actuarial Valuation and Review of Other
Postemployment Benefits (OPEB) as of
June 30, 2016 in accordance with
GASB Statements No. 45 and No. 74

✧ Segal Consulting

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

Copyright © 2018 by The Segal Group, Inc., All rights reserved.



116 Huntington Avenue 8th Floor Boston, MA 02116-5744
T 617.424.7300 www.segalco.com

January 9, 2018

Ms. Mary McIsaac
Director of Finance/Treasurer
Barnstable County
Superior Court House
3195 Main Street
P.O. Box 427
Barnstable, MA 02630

Dear Ms. McIsaac:

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 45 and 74. It establishes the liabilities of the postemployment welfare benefit plan in accordance with GASB Statements Number 45 and 74 for the fiscal year beginning July 1, 2016 and summarizes the actuarial data.

This report is based on information received from the employers and their vendors. The actuarial projections were based on the assumptions and methods described in Exhibit I and on the plan of benefits as summarized in Exhibit II.

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

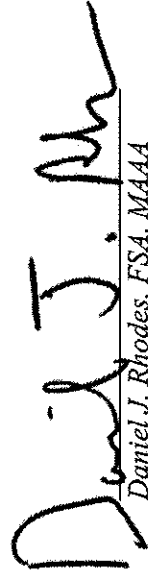
Sincerely,

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

By: 
Kathleen A. Riley, FSA, MAAA, EA

Senior Vice President and Actuary

8641551v8/04446.025


Daniel J. Rhodes, FSA, MAAA

Vice President and Consulting Actuary

SECTION 1**EXECUTIVE SUMMARY**

Important Information About Actuarial Valuations	1
Purpose	3
Valuation Approach.....	3
Accounting Requirements	6
Definitions of Terms.....	7

SECTION 2**VALUATION RESULTS**

Actuarial Certification	10
-------------------------------	----

INDIVIDUAL EMPLOYER RESULTS

Summary of Valuation Results	1
------------------------------------	---

GASB STATEMENT NO. 45

Chart 1 - Schedule of Employer Contributions	2
Chart 2 - Schedule of Funding Progress	2
Chart 3 - Net OPEB Obligation (NOO).....	3
Chart 4 - Required Supplementary Information.....	4
Summary of Participant Data	5

GASB STATEMENT NO. 74

EXHIBIT 1 - Plan Membership.....	1
EXHIBIT 2 - Net OPEB Liability	2
EXHIBIT 3 - Determination of Discount Rate and Investment Rates of Return	4
EXHIBIT 4 - Sensitivity.....	5
EXHIBIT 5 - Schedule of Changes in Net OPEB Liability – Last Ten Fiscal Years.....	6
EXHIBIT 6 - Schedule of Contributions – Last Ten Fiscal Years	7

SECTION 3**SUPPORTING INFORMATION**

EXHIBIT I Actuarial Assumptions and Actuarial Cost Method	12
EXHIBIT II Summary of Plan	27

SECTION 4**DEPARTMENT RESULTS**

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 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, typically reported by the auditor. 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 trend rates to project increases in costs in future years. This forecast also requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year, as well as forecasts of the plan’s benefits for each of those events. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved on the plan’s assets or, if there are no assets, a rate of return based on a yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher (or equivalent quality on another rating scale). All of these factors are uncertain and unknowable. Thus, there will be a range of reasonable assumptions, and the results may vary materially based on which assumptions the actuary selects within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model necessarily uses approximations and estimates that may lead to significant changes in our results but will have no impact on the actual cost of the plan. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

SECTION 1: Executive Summary for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

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 certain towns, school districts and other member units in Barnstable County. 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. You 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 upon delivery and review. 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 Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

PURPOSE

This report presents the results of our actuarial valuation of the postemployment welfare benefit program for certain towns, school districts and other member units in Barnstable County 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).

VALUATION APPROACH

The discount rate used in the valuation to determine the Annual Required Contribution (ARC) for fiscal 2017 under GASB 45 and the Total OPEB Liability as of June 30, 2017 under GASB 74 is the blended discount rate determined in accordance with GASB Statement No. 74. The blended discount rate is the rate determined based on the assets in the OPEB Trust, the entity's funding policy, the June 30, 2017 Bond Buyer's 20 bond index of 3.58% and the expected return on assets. The blending is based on the sufficiency of projected assets to make projected benefit payments.

The funding discount rate is equal to the expected return on assets of 7.25% for all entities with an OPEB Trust invested with the State Retiree Benefits Trust Fund and 7.00% for all other entities.

In the prior valuation, the blending was based on a full funding discount rate of 7.50% and a pay-as-you-go discount rate of 4.50%.

The chart on the following page shows the member units that are included in this valuation and the discount rates used in the current and prior valuations. For the units that have set up qualified trusts, we have also included the balance in the OPEB Trust as of June 30, 2016 and the funding policy as reported to us.

The Entry Age Normal cost method was used for all entities.

The amortization payment on the unfunded actuarial accrued liability (UAAL) included in the ARC is based on a 30-year amortization period, with payments increasing 3.5% per year.

SECTION 1: Executive Summary for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Entity	June 30, 2016 OPEB Trust	Funding Policy	Discount Rate	
			Current Valuation	Prior Valuation
Barnstable County	None	N/A	3.58%	4.50%
Barnstable Fire District*	None	N/A	3.58%	4.50%
Bourne Water District	\$141,274	\$10,000 in fiscal year 2017 and each year thereafter	7.00%	7.50%
Cape Cod Regional Tech School	\$349,929	\$165,000 in fiscal year 2017 and \$100,000 each year thereafter	3.58%	4.50%
Centerville, Osterville, Marstons Mills Fire District	\$1,166,146	\$338,000 in fiscal year 2017 and each year thereafter	5.69%	5.00%
Cotuit Fire District	\$263,251	\$95,416 in fiscal year 2017 and \$149,600 in fiscal year 2018	6.36%	N/A
Dennis Water District	None	N/A	3.58%	4.50%
Dennis-Yarmouth Regional School District	\$0	None	3.58%	4.50%
Hyannis Fire District	None	N/A	3.58%	4.50%
Mashpee Water District	None	N/A	3.58%	4.50%
Monomoy Regional School District	\$124,477	\$100,000 in fiscal year 2017 and each year thereafter	3.58%	4.50%
Nauset Regional School District	\$0	\$40,698 in fiscal year 2017, \$44,510 in fiscal year 2018 and increasing by 10% each year thereafter	3.58%	4.50%
North Sagamore Water District	None	N/A	3.58%	4.50%
Sandwich Water District	None	N/A	3.58%	4.50%
Town of Barnstable	\$2,676,922	\$478,000 in fiscal year 2017 and increasing by \$50,000 each year thereafter	3.58%	5.50%
Town of Bourne	\$790,338	\$250,000 in fiscal year 2017 and each year thereafter	3.58%	4.50%
Town of Brewster	\$1,299,332	\$75,000 in fiscal year 2017, \$55,000 in fiscal year 2018 and \$100,000 each year thereafter	3.58%	5.50%
Town of Chatham	\$422,237	\$150,000 in fiscal year 2017 and each year thereafter	3.78%	5.50%
Town of Dennis	\$346,670	\$300,000 in fiscal year 2017 and \$200,000 each year thereafter	5.81%	6.00%
Town of Eastham	\$25,425	None	3.58%	4.50%
Town of Falmouth	\$356,371	\$100,000 in fiscal year 2017 and each year thereafter	3.58%	4.50%
Town of Harwich	\$535,428	\$100,000 in fiscal year 2017 and fiscal year 2018 and then increasing by \$25,000 each year thereafter (not to exceed \$500,000)	3.58%	4.50%
Town of Mashpee	\$322,713	None	5.08%	5.75%
Town of Orleans	\$610,800	\$150,000 in fiscal year 2017, \$173,343 in fiscal year 2018 and \$150,000 each year thereafter	3.58%	4.50%
Town of Provincetown	\$1,671,333	\$577,581 in fiscal year 2017 and increasing 2.5% per year thereafter	3.96%	5.25%
Town of Sandwich	\$105,332	\$100,000 in fiscal year 2017	7.25%	7.50%
Town of Truro	None	N/A	3.58%	4.50%
			3.58%	7.50%

SECTION 1: Executive Summary for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Entity	June 30, 2016 OPEB Trust	Funding Policy	Discount Rate	
			Current Valuation	Prior Valuation
Town of Wellfleet	\$876,083	\$250,000 in fiscal year 2017 and each year thereafter	7.00%	7.50%
Town of Yarmouth	\$823,508	Fully funding the ARC annually	7.00%	5.25%
Upper Cape Cod Regional Technical School	\$192,857	\$50,000 in fiscal year 2017 and each year thereafter	3.58%	4.50%
West Barnstable Fire District	\$47,601	\$30,000 through fiscal year 2021, increasing to \$74,000 in fiscal 2022, then increasing by 2% per year beginning in fiscal 2023.	7.00%	N/A

* Assets have been set aside but are not held in a qualified OPEB Trust and therefore are not reflected in this valuation.

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.

Page 1 of each entity's individual results shows the liabilities that are used to determine the fiscal 2017 ARC. If the discount rate used in the ARC calculation is less than the expected return on assets, then liabilities based on the expected return on assets are also shown for illustrative purposes.

Pages 2 through 4 of each unit's individual results include the Required Supplemental Information for each unit's financial statements under GASB Statement No. 45. Please note that the historical information shown is from each unit's financial statements. Actual contributions as shown in Chart 1 and Chart 3 are equal to projected benefit payments including the implicit rate subsidy. Additional funding, if any, is added to the contribution. This is the amount that should be used for disclosure and is not the same as premiums paid.

Page 5 is a summary of the participant data used in the current valuation.

If an OPEB Trust has been funded, the disclosure information required under GASB Statement No. 74 for fiscal 2017 follows the GASB Statement No. 45 Required Supplemental Information charts.

SECTION 1: Executive Summary for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

ACCOUNTING REQUIREMENTS

The Governmental Accounting Standards Board (GASB) issued Statement Number 74 – Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans, and Statement Number 75 – Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions. Under these statements, all state and local government entities that provide other post-employment benefits (OPEB) are required to report the cost of these benefits on their financial statements. The accounting standards supplement 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).

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. The benefits valued in this report are limited to those described in Exhibit II, which are based on those 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 is not limited by legal or contractual limits on funding the plan unless those limits clearly translate into benefit limits on the substantive plan being valued.

The new standards introduce 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. These assumptions are summarized in Exhibit I. This amount is then discounted to determine the Total OPEB Liability. The Net OPEB Liability (NOL) is the difference between the Total OPEB Liability and market value of assets in the Plan, called the Net Plan Fiduciary Position.

Once the NOL is determined, the Annual OPEB Expense is determined as the change in NOL from the prior year with deferred recognition of certain elements. In addition, Required Supplementary Information (RSI) must be reported, including historical information about the Net OPEB liability and the Contributions made to the Plan. The following page contains a definition of terms as well as more information about GASB 74/75 concepts.

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 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.

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 1: Executive Summary for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

DEFINITIONS OF TERMS

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

Assumptions or Actuarial Assumptions:

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Actuarial Present Value of Total Projected Benefits (APB):

Present value of all future benefit payments for current retirees and active employees taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions.

Normal Cost/Service Cost:

The amount of contributions required to fund the benefit allocated to the current year of service.

Actuarial Accrued Liability For Actives:

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

Actuarial Accrued Liability For Retirees:

The single sum value of lifetime benefits to existing retirees. This sum takes account of life expectancies appropriate to the ages of the retirees and of the interest which the sum is expected to earn before it is entirely paid out in benefits.

Actuarial Value of Assets (AVA):

The value of assets used by the actuary in the valuation. These may be at market value or some other method used to smooth variations in market value from one valuation to the next.

Funded Ratio:

The ratio AVA/AAL.

Unfunded Actuarial Accrued Liability (UAAL):

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There is a wide range of approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

SECTION 1: Executive Summary for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Amortization of the Unfunded

Actuarial Accrued Liability:

Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

Investment Return (discount rate):

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next. If the plan is funded on a pay-as-you-go basis, the discount rate is tied to the expected rate of return on day-to-day employer funds.

Covered Employee Payroll:

The payroll of the employees that are provided OPEB benefits.

ARC as a Percentage of Covered Payroll:

The ratio of the annual required contribution to covered payroll.

Health Care Cost Trend Rates:

The annual rate of increase in net claims costs per individual benefiting from the Plan.

Annual Required Contribution (ARC):

The ARC is equal to the sum of the normal cost and the amortization of the unfunded actuarial accrued liability.

Net OPEB Obligation (NOO):

The NOO is the cumulative difference between the ARC and actual contributions made. If the plan is not funded, the actual contribution would be equal to the annual benefit payments less retiree contributions. There are additional adjustments in the NOO calculations to adjust for timing differences between cash and accrual accounting, and to prevent double counting of OPEB plan costs.

Total OPEB Liability:

Present value of all future benefit payments for current retirees and active employees taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions.

Actuarially Determined Contribution: A target or recommended contribution to an OPEB plan for the reporting period based on the most recent measurement available.

Valuation Date:

The date at which the actuarial valuation is performed

SECTION 1: Executive Summary for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Discount Rate:

The single rate of return, that when applied to all projected benefit payments results in an actuarial present value that is the sum of the following:

- (1) the actuarial present value of projected benefit payments projected to be funded by plan assets using a long term rate of return, and
 - (2) the actuarial present value of projected benefit payments that are non included in (1) using a yield or index rate for 20 year tax exempt general obligation municipal bonds with an average rating of AA/Aa or higher
- An actuarial cost method where the present value of the projected benefits for an individual is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age

Entry Age Actuarial Cost Method:

Healthcare Cost Trend Rates:

The rate of change in per capita health costs over time

Net OPEB Liability:

The Total OPEB Liability less the Plan Net Fiduciary Position

Plan Net Fiduciary Position:

Market Value of Assets

Real Rate of Return:

The rate of return on an investment after removing inflation

SECTION 2: Valuation Results for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

January 9, 2018

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 other postemployment benefit programs for certain towns, school districts and other member units in Barnstable County 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 45 and 74 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 employers and on participant, premium data and claims and expense experience provided by the employers or from vendors employed by the employers. 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 of the plan, or determining short-term cash flow requirements.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: retiree group benefits program experience 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.

The actuarial calculations were directed under our supervision. We are members of the American Academy of Actuaries and collectively meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Member Units are reasonably related to the experience of and the expectations for the Plan.


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


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

SECTION 2: GASB 45 Information for the Town of Harwich June 30, 2016 Valuation

**SUMMARY OF VALUATION RESULTS
TOWN OF HARWICH**

	7.00% discount rate June 30, 2016	5.08% discount rate June 30, 2016
Actuarial Accrued Liability by Participant Category		
1. Current retirees, beneficiaries and dependents	\$21,497,904	\$25,975,130
2. Current active members	<u>10,765,871</u>	<u>14,073,017</u>
3. Total as of July 1, 2016: (1) + (2)	\$32,263,775	\$40,048,147
4. Actuarial value of assets as of July 1, 2016	<u>\$35,428</u>	<u>\$35,428</u>
5. Unfunded actuarial accrued liability (UAAL) as of July 1, 2016: (3) - (4)	\$31,728,347	\$39,512,719
Annual Required Contribution for Fiscal Year Ending June 30, 2017		
6. Normal cost as of July 1, 2016	\$684,251	\$1,038,842
7. Adjustment for timing	<u>23,544</u>	<u>26,060</u>
8. Normal cost adjusted for timing: (6) + (7)	\$707,795	\$1,064,902
9. 30-year amortization of the unfunded actuarial accrued liability (UAAL) increasing at 3.5% per year	\$1,644,031	\$1,626,649
10. Adjustment for timing	<u>\$6,568</u>	<u>40,805</u>
11. Amortization payment adjusted for timing: (9) + (10)	\$1,700,599	\$1,667,454
12. Total Annual Required Contribution (ARC): (8) + (11)	2,408,394	2,732,356
13. Projected benefit payments for fiscal year ending June 30, 2017	\$1,866,279	\$1,866,279

Note: Adjustment for timing assumes payment in the middle of the year.

SECTION 2: GASB 45 Information for the Town of Harwich June 30, 2016 Valuation

TOWN OF HARWICH

Required Supplementary Information

CHART 1

Schedule of Employer Contributions

Fiscal Year Ended June 30,	Annual OPEB Cost	Actual Contributions	Percentage Contributed
2009	\$5,051,365	\$1,472,535	29.2%
2010	5,372,601	1,975,862	36.8
2011	5,364,226	2,200,444	41.0
2012	5,674,081	2,497,353	44.0
2013	2,921,960	1,816,588	62.2
2014	3,040,736	1,947,624	64.1
2015	3,040,675	1,976,475	65.0
2016	3,170,780	2,104,971	66.4
2017	2,884,091	1,966,279	68.2

Note: Fiscal year 2017 includes an OPEB trust contributions of \$100,000.

CHART 2

Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAAL) (b) – (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAAL as a Percentage of Covered Payroll [(b) – (a) / (c)]
6/30/2006	\$0	\$0	\$0	0.0%	N/A	N/A
6/30/2008	0	70,177,265	70,177,265	0.0%	N/A	N/A
6/30/2010	0	81,139,558	81,139,558	0.0%	N/A	N/A
6/30/2012	0	44,084,195	44,084,195	0.0%	N/A	N/A
6/30/2014	0	42,724,608	42,724,608	0.0%	N/A	N/A
6/30/2016	535,428	40,048,147	39,512,719	1.3%	15,514,239	254.7%

SECTION 2: GASB 45 Information for the Town of Harwich June 30, 2016 Valuation

CHART 3

Net OPEB Obligation (NOO)

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)
2009	\$5,051,365	\$0	\$0	\$5,051,365	\$1,472,535	\$3,578,830	\$3,578,830
2010	5,329,117	161,930	-118,446	5,372,601	1,975,862	3,396,739	6,975,569
2011	5,270,566	348,778	-255,118	5,364,226	2,200,444	3,163,782	10,139,351
2012	5,537,940	506,968	-370,827	5,674,081	2,497,353	3,176,728	13,316,079
2013	2,808,742	599,224	-486,006	2,921,960	1,816,588	1,105,372	14,421,451
2014	2,918,121	648,965	-526,350	3,040,736	1,947,624	1,093,112	15,514,563
2015	2,818,966	892,087	-670,378	3,040,675	1,976,475	1,064,200	16,578,763
2016	2,933,863	953,279	-716,362	3,170,780	2,104,971	1,065,809	17,644,572
2017	2,732,356	896,344	-744,609	2,884,091	1,966,279	917,812	18,562,383

Note: Fiscal year 2017 includes an OPEB trust contributions of \$100,000.

SECTION 2: GASB 45 Information for the Town of Harwich June 30, 2016 Valuation

TOWN OF HARWICH

CHART 4

Required Supplementary Information

Valuation date	June 30, 2016
Actuarial cost method	Entry Age Normal – Level percentage of payroll
Amortization method	Payments increasing at 3.5%
Amortization period	30 years open
Asset valuation method	Market value
Actuarial assumptions:	
Investment rate of return	7.00%
Discount rate	5.08%
Inflation rate	3.5%
Projected salary increases	Service-related increases for Group 1 (excluding Teachers) and Group 2 employees: 6.00% decreasing over 9 years to an ultimate level of 4.25% Service-related increases for Group 4 members: 7.00% decreasing over 5 years to an ultimate level of 4.75% Service-related increases for Teachers: 7.50% decreasing over 20 years to an ultimate level of 4.00%
CCMHG Medical/Prescription drug cost trend rate	Under 65: 10.5%, then 7.0% decreasing by 0.5% for 6 years to an ultimate rate of 4.5% per year. Over 65: 1.9% then 7.0% decreasing by 0.5% for 6 years to an ultimate level of 4.5% per year
GIC Medical/Prescription drug cost trend rate	Under 65: 6.8%, then 8.5% decreasing by 0.5% for 8 years to an ultimate rate of 5.0% per year. Over 65: 1.6% then 8.5% decreasing by 0.5% for 8 years to an ultimate level of 5.0% per year
Dental	2.1% for 1 year then 4.5% thereafter
Part B reimbursement and/or penalties	4.5%
Plan membership:	
Current retirees, beneficiaries, and dependents	359
Current active members	156
Total	515

Notes: Plan membership counts do not include retirees, if any, eligible for life insurance benefits only.
CCMHG and GIC trends reflect known increases.

SECTION 2: GASB 45 Information for the Town of Harwich June 30, 2016 Valuation

TOWN OF HARWICH

Summary of Participant Data

Active employees covered for medical benefits as of June 30, 2016

Number of employees	
Male	104
Female	<u>52</u>
Total	156
Average age	49.4
Average service	13.6

Retired employees, spouses and beneficiaries covered for medical benefits as of June 30, 2016

Number of individuals	359
Average age	71.8

Note: The counts reflect retired employees, spouses and beneficiaries covered for medical benefits as of June 30, 2016 and does not include retirees, if any, eligible for life insurance benefits only.

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

EXHIBIT 1
Plan Membership

Plan membership: At June 30, 2016, the Town of Harwich plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	359
Active members	<u>156</u>
Total	515

Note: We have assumed other general information about the Plan will be provided by the Town of Harwich's auditors.

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

EXHIBIT 2

Net OPEB Liability

The components of the Net OPEB Liability of the Town of Harwich are as follows:

	June 30, 2017
Total OPEB liability	\$41,198,362
Plan fiduciary net position	<u>667,252</u>
Net OPEB Liability	\$40,531,110
Plan fiduciary net position as a percentage of the total OPEB liability*	1.62%

* These funded percentages are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.

Actuarial assumptions. The total OPEB liability was measured by an actuarial valuation as of June 30, 2016 using the following actuarial assumptions, applied to all periods included in the measurement, unless otherwise specified:

Inflation

3.5%

Salary increases

Service-related increases for Group 1 (excluding Teachers) and Group 2 employees: 6.00% decreasing over 9 years to an ultimate of 4.25%

Service-related increases for Group 4 members: 7.00% decreasing over 5 years to an ultimate level of 4.75%

Service-related increases for Teachers: 7.50% decreasing over 20 years to an ultimate level of 4.00%

Discount rate:

5.08% as of June 30, 2017 and 4.66% as of June 30, 2016

Investment rate of return:

7.25% for assets invested in the State Retiree Benefits Trust Fund, 7.0% for all others.

Health care trend rates*

CCMHG

Under 65

Over 65

Dental

10.5% for 1 year, then 7.0% decreasing by 0.5% each year to an ultimate level of 4.5% per year

1.9% for 1 year, then 7.0% decreasing by 0.5% each year to an ultimate level of 4.5% per year

2.1% for 1 year, then 4.5% per year

GIC

Under 65

Over 65

Part B

Contributions

6.8% for 1 year, then 8.5% decreases by 0.5% each year to an ultimate level of 5.0% per year

1.6% for 1 year, then 8.5% decreasing by 0.5% each year to an ultimate level of 5.0% per year

4.5%

Retiree contributions are expected to increase with the respective trend shown above.

*Trends reflect known increases.

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

Preretirement Mortality Rates:

Healthy Non-Teachers

RP-2000 Employee Mortality Table projected generationally with Scale BB2D from 2009

Healthy Non-Teachers (Falmouth)

RP-2000 Employee Mortality Table projected generationally with Scale BB from 2009

Healthy Teachers

RP-2014 White Collar Employee Mortality Table projected generationally with Scale MP-2016

Postretirement Mortality Rates:

Healthy Non-Teachers

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2009

Healthy Non-Teachers (Falmouth)

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB from 2009

Healthy Teachers

RP-2014 White Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2016

Disabled Non-Teachers

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2015

Disabled Non-Teachers (Falmouth)

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB from 2012

Disabled Teachers

RP-2014 Healthy Annuitant Mortality Table set forward 4 years and projected generationally with Scale BB2B from 2014

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

Detailed information regarding all actuarial assumptions can be found in Section 3, Exhibit I.

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

EXHIBIT 3

Determination of Discount Rate and Investment Rates of Return

DEVELOPMENT OF LONG-TERM RATE

The long-term expected rate of return on OPEB plan investments was determined using a building block method in which best estimate ranges of expected future rates of return (expected returns, net of investment expense and inflation) are developed for each major asset class. These returns are combined to produce the 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 and subtracting expected investment expenses and a risk margin. The arithmetic real rates of return for each major asset class, after deducting inflation, but before investment expenses, used in the derivation of the long-term expected investment rate of return assumption are summarized below:

Asset Class	Long-Term Expected Real Rate of Return
Domestic equity	6.44%
International developed markets equity	7.40%
International emerging markets equity	9.42%
Core fixed income	2.02%
High-yield fixed income	4.43%
Real estate	5.00%
Commodities	4.43%
Hedge fund, GTAA, Risk parity	3.75%
Private equity	<u>10.47%</u>
Total	100.00%

Nature of Assets: The assets are in an irrevocable OPEB trust and are invested with Rockland Trust.

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

**EXHIBIT 4
Sensitivity**

Sensitivity of the net OPEB liability to changes in the discount rate.

The following presents the NOL of the Town of Harwich as well as what the Town of Harwich's NOL would be if it were calculated using a discount rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate:

	1% Decrease in Discount Rate	Current Discount Rate	1% Increase in Discount Rate
Town of Harwich's net OPEB liability as of June 30, 2017	\$45,928,865	\$40,531,110	\$36,066,831

Sensitivity of the net OPEB liability to changes in the healthcare cost trend rates.

The following presents the net OPEB liability of the Town of Harwich, as well as what the Town of Harwich's net OPEB liability would be if it were calculated using a healthcare cost trend rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate:

	1% Decrease in Trend Rates	Current Trend Rates	1% Increase in Trend Rates
Town of Harwich's net OPEB liability as of June 30, 2017	\$35,657,221	\$40,531,110	\$46,575,392

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

EXHIBIT 5

Schedule of Changes in Net OPEB Liability – Last Ten Fiscal Years

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total OPEB liability										
Service cost	\$1,078,218									
Interest	1,971,659									
Differences between expected and actual experience	0									
Changes of assumptions	-2,139,815									
Plan amendments	0									
Benefit payments, including refunds of member contributions	-1,866,279									
Net change in Total OPEB Liability	-\$956,217									
Total OPEB Liability - beginning	42,154,572									
Total OPEB Liability - ending (a)	\$41,198,362									
Plan Fiduciary Net Position										
Contributions - employer	\$1,966,279									
Contributions - employee	0									
Net investment income	31,824									
Benefit payments, including refunds of member contributions	-1,866,279									
Administrative expenses	0									
Net change in Fiduciary Net Position	\$131,824									
Plan Fiduciary Net Position - beginning	535,428									
Plan Fiduciary Net Position - ending (b)	\$667,252									
Net OPEB liability - ending: (a)-(b)	\$40,531,110									
Plan's fiduciary net position as a percentage of the total OPEB liability	1.62%									
Covered-employee payroll	\$15,514,239									
Net OPEB liability as a percentage of covered-employee payroll	261.25%									

Note: 2017 employer contributions include projected benefit payments of \$1,866,279 and \$100,000 in employer contributions to the trust.

Notes to Schedule:

Changes in Assumptions:

The discount rate was increased from 4.66% as of June 30, 2016 to 5.08% as of June 30, 2017.

Changes in Plan Provisions:

None.

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

EXHIBIT 6

Schedule of Contributions – Last Ten Fiscal Years

	Year End June 30,									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Actuarially determined contribution	\$2,732,356									
Contributions in relation to the actuarially determined contribution	<u>1,966,279</u>									
Contribution deficiency (excess)	\$766,077									
Covered-employee payroll	15,514,239									
Contributions as a percentage of covered-employee payroll	12.67%									

(Historical information prior to implementation of GASB 74/75 is not required)

Notes to Schedule:

Methods and assumptions used to establish actuarially determined contribution rates for fiscal 2017:

Valuation date:

Actuarially determined contribution for fiscal year ending June 30, 2017 was determined with the June 30, 2016 actuarial valuation.

Actuarial cost method:

Entry Age Normal – Level Percentage of Payroll

Amortization method:

Level percentage of payroll

Remaining amortization period:

30 years from July 1, 2016

Asset valuation method:

Market value

Discount rate:

5.08%

Investment rate of return:

7.25% for assets invested in the State Retiree Benefits Trust Fund, 7.0% for all others.

Health care trend rates*

CCMHG

Under 65

Over 65

Dental

10.5% for 1 year, then 7.0% decreasing by 0.5% each year to an ultimate level of 4.5% per year
1.9% for 1 year, then 7.0% decreasing by 0.5% each year to an ultimate level of 4.5% per year
2.1% for 1 year, then 4.5% per year

SECTION 2: GASB 74 Information for the Town of Harwich June 30, 2016 Valuation

GIC

Under 65

Over 65

Part B

Contributions

**Trends reflect known increases.*

6.8% for 1 year, then 8.5% decreases by 0.5% each year to an ultimate level of 5.0% per year
1.6% for 1 year, then 8.5% decreasing by 0.5% each year to an ultimate level of 5.0% per year
4.5%

Retiree Contribution are expected to increase with the respective trend shown above.

Preretirement Mortality Rates:

Healthy Non-Teachers

RP-2000 Employee Mortality Table projected generationally with Scale BB2D from 2009

Healthy Non-Teachers (Falmouth)

RP-2000 Employee Mortality Table projected generationally with Scale BB from 2009

Healthy Teachers

RP-2014 White Collar Employee Mortality Table projected generationally with Scale MP-2016

Postretirement Mortality Rates:

Healthy (Non-Teachers)

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2009

Healthy Non-Teachers (Falmouth)

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB from 2009

Healthy Teachers

RP-2014 White Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2016

Disabled Non-Teachers

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB2D from 2015

Disabled Non-Teachers (Falmouth)

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB from 2012

Disabled Teachers

RP-2014 Healthy Annuitant Mortality Table set forward 4 years and projected generationally with Scale BB2B from 2014

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

EXHIBIT I

Actuarial Assumptions and Actuarial Cost Method

Data:

Detailed census data, claims experience, premium rates, and summary plan descriptions for postemployment welfare benefits were provided by the employers.

Actuarial Cost Method:

Entry Age Normal – Level Percentage of Payroll (previously, Projected Unit Credit or Level Dollar Entry Age Normal)

Per Capita Cost Development:

CCMHG Retirees

*Medical and Prescription
Drug Costs*

Per capita claims costs were based on the approved funding rates (for self-funded plans) or insured premium rates (for fully insured plans) charged by the Cape Cod Municipal Health Group to the member units for the period July 1, 2016 through June 30, 2017. (The Medicare plans renew on January 1, so the costs for these plans were based on the calendar year 2017 premium rates.)

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.

Per capita claims costs were based on the Delta Dental funding rates charged by the CCMHGH to the member units for the period July 1, 2016 through June 30, 2017.

Dental

Town of Bourne (Non-Teachers)

Medical and Prescription Drug

Per capita claims costs were based on actual paid claim experience furnished by the Town and its carrier, Blue Cross Blue Shield of Massachusetts, for the period July 1, 2014 through June 30, 2017. Claims were separated by plan year and plan design, then adjusted as follows:

- > actual large claims were replaced by the *expected* amount of large claims using the stop loss premiums to smooth out random fluctuations in experience.
- > total claims were divided by the number of adult members to yield a per capita claim,
- > the per capita claim was trended to the midpoint of the valuation year at assumed trend rates, and
- > the per capita claim was adjusted for the effect of any plan changes.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Per capita claims for each plan year and a manual rate based on national data were then combined by taking a weighted average. 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.

Per capita claims costs for the Town's Blue MedicareRx Prescription Drug Plan for Medicare-eligible retirees were based on the premium rates for the plan as of January 1, 2016 and January 1, 2017, trended to the midpoint of the valuation year at assumed trend rates.

Dental

Per capita costs were based on actual paid claim experience furnished by the Town and its carrier, Blue Cross Blue Shield of Massachusetts, for the period July 1, 2014 through June 30, 2017. Claims were separated by plan year and adjusted as described above to yield a weighted average per capita claims cost.

Retired GIC Teachers from the Towns of Barnstable, Bourne, Eastham and Upper Cape Cod RTS

Medical and Prescription Drug

Per capita claims costs for retired teachers participating in the Group Insurance Commission's (GIC) Retired Municipal Teachers plans were taken from the Commonwealth of Massachusetts Postemployment Benefits Other than Pensions Actuarial Valuation as of January 1, 2016. The costs shown in the valuation report were trended to the midpoint of the valuation year at assumed trend rates.

Valuation Date:

June 30, 2016

Roll-Forward Techniques:

The liabilities as of June 30, 2016 were adjusted forward using standard actuarial techniques to determine the Total OPEB Liability as of the June 30, 2017 measurement date.

Expected Return Assets:

7.25% for entities with assets invested in the State Retiree Benefits Trust Fund, 7.0% for all other entities (previously, 7.5%).

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.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Discount Rate:

Member Unit	Discount Rate (%)	
	June 30, 2016	June 30, 2017
Barnstable County	2.85%	3.58%
Barnstable Fire District	2.85	3.58
Bourne Water District	7.00	7.00
Cape Cod Regional Tech School	2.85	3.58
Centerville, Osterville, Marstons Mills Fire District	5.32	5.69
Cotuit Fire District	6.12	6.36
Dennis Water District	2.85	3.58
Dennis-Yarmouth Regional School District	2.85	3.58
Hyannis Fire District	2.85	3.58
Mashpee Water District	2.85	3.58
Monomoy Regional School District	2.85	3.58
Nauset Regional School District	2.85	3.58
North Sagamore Water District	2.85	3.58
Sandwich Water District	2.85	3.58
Town of Barnstable	2.85	3.58
Town of Bourne	2.85	3.58
Town of Brewster	3.05	3.78
Town of Chatham	2.85	5.81
Town of Dennis	2.85	3.58
Town of Eastham	2.85	3.58
Town of Falmouth	2.85	3.58
Town of Harwich	4.66	5.08
Town of Mashpee	2.85	3.58
Town of Orleans	2.85	3.58
Town of Provincetown	7.25	7.25
Town of Sandwich	2.85	3.58
Town of Truro	2.85	3.58

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Member Unit	Discount Rate (%)	
	June 30, 2016	June 30, 2017
Town of Wellfleet	7.00%	7.00%
Town of Yarmouth	7.00	7.00
Upper Cape Cod Regional Technical School	2.85	3.58
West Barnstable Fire District	3.06	3.80

The discount rate is a blend of the long-term expected rate of return on OPEB Trust assets and a yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher (3.58% as of June 30, 2017 and 2.85% as of June 30, 2016). The blending is based on the sufficiency of projected assets to make projected benefit payments.

Salary Increases:

Service-related increases for Group 1 (excluding Teachers) and Group 2 employees: 6.00% decreasing over 9 years to an ultimate of 4.25%
 Service-related increases for Group 4 members: 7.00% decreasing over 5 years to an ultimate level of 4.75%
 Service-related increases for Teachers: 7.50% decreasing over 20 years to an ultimate level of 4.00%

Asset Valuation Method:

Market Value

Preretirement Mortality Rates:

Healthy Non-Teachers

RP-2000 Employee Mortality Table projected generationally with Scale BB2D from 2009 (previously, RP-2000 Employee Mortality Table projected generationally with Scale AA from 2010)

Healthy Non-Teachers (Falmouth)

RP-2000 Employee Mortality Table projected generationally with Scale BB from 2009 (previously, RP-2000 Employee Mortality Table projected 22 years with Scale AA)

Healthy Teachers

RP-2014 White Collar Employee Mortality Table projected generationally with Scale MP-2016 (previously, RP-2000 Combined Healthy White Collar Mortality Table projected 22 years with Scale AA)

Postretirement Mortality Rates:

Healthy Non-Teachers

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)

Healthy Non-Teachers (Falmouth)

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB from 2009 (previously, RP-2000 Annuitant Mortality Table projected 17 years with Scale AA)

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Healthy Teachers

RP-2014 White Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2016 (previously, RP-2000 Healthy Annuitant Large Benefit Amount Mortality Table projected 17 years with 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 generationally with Scale AA from 2010 set forward 3 years for males)

Disabled Non-Teachers (Falmouth)

RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale BB from 2012 (previously, RP-2000 Healthy Annuitant Mortality Table set forward 3 years for males projected 17 years with Scale AA)

Disabled Teachers

RP-2014 Healthy Annuitant Mortality Table set forward 4 years and projected generationally with Scale BB2D from 2014 (previously, RP-2000 Healthy Annuitant Large Benefit Amount 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 generational projection to reflect future mortality improvement between the measurement date and those years.

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: Rates shown are before generational projection.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Teacher Annuitant Mortality Rates:

Age	Rate per year (%)	
	Male	Female
60	0.52	0.39
70	1.24	1.06
80	3.73	3.04
90	12.62	10.02

Note: Rates shown are before generational projection.

Termination Rates before Retirement:

Groups 1 and 2 (excluding Teachers)

Age	Rate per year (%)	
	Male	Female
Mortality		
20	0.03	0.02
25	0.04	0.02
30	0.04	0.03
35	0.08	0.05
40	0.11	0.07
45	0.15	0.11
50	0.21	0.17
55	0.30	0.25
60	0.49	0.39
Disability		
		0.01
		0.02
		0.03
		0.06
		0.10
		0.15
		0.19
		0.24
		0.28

Notes: 55% of the rates shown represent accidental disability and death.

Mortality rates do not reflect generational projection.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Group 4			
Age	Rate per year (%)		Disability
	Mortality	Female	
20	Male 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	0.30
45	0.15	0.11	1.00
50	0.21	0.17	1.25
55	0.30	0.25	1.20
60	0.49	0.39	0.85

*Notes: 90% of the rates shown represent accidental disability and death.
Mortality rates do not reflect generational projection.*

Teachers			
Age	Rate per year (%)		Disability
	Mortality	Female	
20	Male 0.02	0.01	0.00
25	0.03	0.01	0.01
30	0.02	0.01	0.01
35	0.03	0.02	0.01
40	0.03	0.07	0.01
45	0.05	0.04	0.03
50	0.09	0.07	0.05
55	0.15	0.11	0.07
60	0.25	0.15	0.07

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

[illegible][illegible]

Rate per year (%)	
Groups 1 and 2 (excluding Teachers)	Years of Service 0 1
15.0 12.0	0 – 10 11+
Group 4	1.5 0.0

Age	Teachers – Withdrawal Rate (%)					
	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 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Retirement Rates:

Age	All Groups (excluding Teachers) – Rate per year (%)		
	Groups 1 and 2		Group 4
	Male	Female	
45 - 49	--	--	1.0
50 -- 51	1.0	1.5	2.0
52	1.0	2.0	2.0
53	1.0	2.5	5.0
54	2.0	2.5	7.5
55	2.0	5.5	15.0
56 -- 57	2.5	6.5	10.0
58	5.0	6.5	10.0
59	6.5	6.5	15.0
60	12.0	5.0	20.0
61	20.0	13.0	20.0
62	30.0	15.0	25.0
63	25.0	12.5	25.0
64	22.0	18.0	30.0
65	40.0	15.0	100.0
66 - 67	25.0	20.0	--
68	30.0	25.0	--
69	30.0	20.0	--
70	100.0	100.0	--

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Age	Teachers - Rate per year (%)					
	Less than 20			20 – 29		
	Male	Female		Male	Female	
50 - 52	--	--		1.0	1.0	30 or more
53	--	--		1.5	1.0	Male 2.0 Female 1.5
54	--	--		2.5	1.0	Male 2.0 Female 2.0
55	5.0	3.0		3.0	3.0	Male 6.0 Female 5.0
56	5.0	3.0		6.0	5.0	Male 20.0 Female 15.0
57	5.0	4.0		10.0	8.0	Male 40.0 Female 35.0
58	5.0	8.0		15.0	10.0	Male 50.0 Female 35.0
59	10.0	8.0		20.0	15.0	Male 50.0 Female 35.0
60	10.0	10.0		25.0	20.0	Male 40.0 Female 35.0
61	20.0	12.0		30.0	25.0	Male 40.0 Female 35.0
62	20.0	12.0		35.0	30.0	Male 35.0 Female 35.0
63	25.0	15.0		40.0	30.0	Male 35.0 Female 35.0
64	25.0	20.0		40.0	30.0	Male 35.0 Female 35.0
65	25.0	25.0		40.0	40.0	Male 35.0 Female 35.0
66	30.0	25.0		30.0	30.0	Male 40.0 Female 35.0
67	30.0	30.0		30.0	30.0	Male 40.0 Female 30.0
68	30.0	30.0		30.0	30.0	Male 40.0 Female 30.0
69	30.0	30.0		30.0	30.0	Male 40.0 Female 30.0
70	100.0	100.0		100.0	100.0	Male 100.0 Female 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 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Per Capita Health Costs:

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.

CCMHG

Age	Non-Medicare Plans				Medicare Plans			
	Retiree		Spouse		Retiree		Spouse	
	Male	Female	Male	Female	Male	Female	Male	Female
45	\$8,606	\$10,796	\$5,338	\$8,059	N/A	N/A	N/A	N/A
50	10,215	11,635	7,135	9,342	N/A	N/A	N/A	N/A
55	12,131	12,525	9,547	10,814	N/A	N/A	N/A	N/A
60	14,407	13,500	12,781	12,542	N/A	N/A	N/A	N/A
65	17,110	14,544	17,110	14,544	\$3,803	\$3,233	\$3,803	\$3,233
70	19,830	15,673	19,830	15,673	4,408	3,484	4,408	3,484
75	21,370	16,870	21,370	16,870	4,750	3,750	4,750	3,750
80	23,013	18,188	23,013	18,188	5,115	4,043	5,115	4,043

GIC Plans

Age	Retired on or before June 1, 1990				Retired after June 1, 1990			
	Non-Medicare Eligible		Medicare Eligible		Non-Medicare Eligible		Medicare Eligible	
	Retiree	Spouse	Retiree	Spouse	Retiree	Spouse	Retiree	Spouse
45	\$6,360	\$6,040	N/A	N/A	\$6,030	\$5,597	N/A	N/A
50	7,664	7,278	N/A	N/A	7,266	6,744	N/A	N/A
55	9,460	8,983	N/A	N/A	8,969	8,324	N/A	N/A
60	11,733	11,141	N/A	N/A	11,124	10,324	N/A	N/A
65	14,153	13,444	\$3,270	\$3,270	13,424	12,467	\$3,097	\$3,097
70	16,509	15,693	3,809	3,809	15,669	14,565	3,607	3,607
75	18,336	17,436	4,226	4,226	17,410	16,194	4,003	4,003
80	19,659	18,697	4,530	4,530	18,667	17,363	4,290	4,290

Note: Costs are net of contributions.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Annual Dental Cost:
CCMHG \$579

Weighted Average Annual Retiree Contribution Amount:

CCMHG
Non-Medicare Plans \$12,149
Medicare Plans 4,030

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 must be applied to that year’s cost to yield the next year’s projected cost.

Medical/Prescription Drug

Year Ending June 30	CCMHG			GIC		
	Under 65	Over 65	Dental	Under 65	Over 65	Part B
2017	10.5%	1.9%	2.1%	6.8%	1.6%	4.5%
2018	7.0%	7.0%	4.5%	8.5%	8.5%	4.5%
2019	6.5%	6.5%	4.5%	8.0%	8.0%	4.5%
2020	6.0%	6.0%	4.5%	7.5%	7.5%	4.5%
2021	5.5%	5.5%	4.5%	7.0%	7.0%	4.5%
2022	5.0%	5.0%	4.5%	6.5%	6.5%	4.5%
2023	4.5%	4.5%	4.5%	6.0%	6.0%	4.5%
2024	4.5%	4.5%	4.5%	5.5%	5.5%	4.5%
2025 & later	4.5%	4.5%	4.5%	5.0%	5.0%	4.5%

The first year valuation trend reflects a known increase in costs from fiscal year 2017 to fiscal year 2018.

Otherwise, the trend rate assumptions for CCMHG were developed using Segal’s internal guidelines, which are established each year using data sources such as the 2017 Segal Health Trend Survey, internal client results, and 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. The medical/prescription drug trend assumption for GIC after the first year 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, completed by Aon Hewitt.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

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.

100% of retirees over age 65 are assumed to remain in their current medical plan for life and continue dental and life insurance coverage, if elected.

50% of future retirees with medical coverage are assumed to have life insurance coverage, and 90% are assumed to have dental benefits if the retirees are eligible for those benefits according to unit.

The following is the assumed plan enrollment for current retirees under age 65 and future retirees hired prior to 1986 upon reaching age 65:

	Percent Enrolled in Medicare Plan (%)	Percent Enrolled in Non-Medicare Plan (%)
Barnstable County	100	--
Barnstable Fire District	100	--
Bourne Water District	100	--
Cape Cod Regional Technical School	100	--
Centerville, Osterville, Marstons Mills Fire District	100	--
Cotuit Fire Department	90	10
Dennis Water District	100	--
Dennis-Yarmouth Regional School District	95	5
Hyannis Fire District	100	--
Mashpee Water District	100	--
Monomoy Regional School District*	100	--
Nauset Regional School District	100	--
North Sagamore Water District	100	--
Sandwich Water District	100	--
Town of Barnstable	100	--
Town of Bourne	100	--
Town of Brewster	100	--
Town of Chatham	90	10
Town of Dennis	95	5
Town of Eastham	95	5
Town of Falmouth	90	10
Town of Harwich	95	5

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

	Percent Enrolled in Medicare Plan (%)	Percent Enrolled in Non-Medicare Plan (%)
Town of Mashpee	95%	5%
Town of Orleans	95	5
Town of Provincetown	95	5
Town of Sandwich	95	5
Town of Truro	100	--
Town of Wellfleet	90	10
Town of Yarmouth	100	--
Upper Cape Cod Regional Technical School	100	--
West Barnstable Fire District	100	--

* Assumption has been revised to reflect current experience.

Towns of Barnstable, Bourne, and Eastham and Upper Cape Cod RTS (retired teachers):

All future and current retired teachers under 65 are assumed to elect a GIC indemnity plan upon retirement. For future retirees hired prior to 1986 and current retirees under the age of 65 (excluding Upper Cape Cod RTS), 90% are assumed to be eligible for Medicare and 10% are assumed to be ineligible and remain in a non-Medicare GIC indemnity plan upon reaching age 65. For future retirees hired in 1986 or later (excluding Upper Cape Cod RTS), 100% are assumed to be eligible for Medicare and enroll in a GIC indemnity plan on reaching age 65. For all future and current retirees for Upper Cape Cod RTS, 100% are assumed to be eligible for Medicare and enroll in a GIC indemnity plan on reaching age 65.

Plan Design:

Development of plan liabilities was based on the substantive plan of benefits in effect as described in Exhibit II.

Administrative Expenses:

Administrative expenses for self-insured plans were assumed to increase at 3.0%. Administrative expenses for insured plans were assumed to be included in the fully insured premium rates.

Life Insurance:

100% of future retirees are assumed to elect life insurance coverage.

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.

Demographic and Salary Increase Assumptions:

Many of the demographic assumptions for non-teachers used in this valuation (including mortality, disability, turnover and retirement) and the salary increase assumption are the same as used in the Barnstable County Retirement System Actuarial Valuation as of January 1, 2016, dated June 22, 2016, the Falmouth Retirement System Actuarial Valuation Report as of January 1, 2016, dated February 14, 2017, and the Massachusetts

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Teachers' Retirement System Actuarial Valuation Report as of January 1, 2017, dated September 25, 2017, completed by PERAC. 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.

The remaining demographic assumptions, such as percent married and enrollment elections, were based on the experience of the Plan and the experience of similar plans.

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 in this valuation was explicitly calculated except for the, employers participating in the GIC plans where the actuarial accrued liability was increased by 1.24%, and normal cost was increased by 3.46%. The GIC assumption comes from the January 1, 2016 OPEB Actuarial Valuation for the Commonwealth of Massachusetts, prepared by Aon Hewitt and dated October 24, 2016.

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 for CCMHG retirees were updated to reflect current experience.
- The medical/prescription drug trend assumptions for CCMHG retirees were revised to reflect current experience and future expectations.
- Per capita health costs and trends for GIC retirees were updated based on the Commonwealth of Massachusetts Postemployment Benefits Other than Pensions Actuarial Valuation as of January 1, 2016.
- The discount rates were updated to comply with the requirements of GASB Statement No. 74.
- The funding method was changed to comply with the requirements of GASB Statement No. 74.
- The expected return on assets was updated to 7.25% for entities with assets invested in the State Retiree Benefits Trust Fund and 7.0% for all other entities.
- The excise tax on high cost health plans beginning in 2020 was recalculated with this valuation.
- The plan election assumption upon reaching age 65 was revised for the Monomoy Regional School District.
- The mortality assumptions were updated to reflect past experience and future expectations.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

EXHIBIT II

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 Barnstable County Contributory Retirement System, the Falmouth 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.

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Employer Percentage Contribution:

Unit	Employer Contribution Percentage						Life Insurance	Retiree Life Insurance Benefit
	Medical				Surviving Spouses	Dental		
	Retirees and Spouses		Under Age 65	Age 65 and Over				
	Under Age 65	Age 65 and Over						
Barnstable County	75%	75%	75%	75%	75%	75%	75%	\$10,000
Barnstable Fire District	80%	80%	80%	80%	80%	80%	80%	\$10,000
Bourne Water District	75%	75%	50%	50%	50%	50%	75%	\$5,000
Cape Cod Regional Technical School	65%	65%	65%	65%	65%	65%	99%	\$10,000
Centerville, Osterville, Marstons Mills Fire Distri	70-90%	80%	70-90%	80%	80%	80%	80%	\$1,000
Coutit Fire District	75%	75%	0%	0%	0%	0%	75%	\$2,000
Dennis Water District	75%	75%	50%	50%	50%	50%	75%	\$5,000
Dennis-Yarmouth Regional School District	60%	60%	0%	0%	0%	0%	60%	\$1,000
Hyannis Fire District	95%	95%	95%	95%	95%	95%	95%	\$5,000
Mashpee Water District	75%	75%	75%	75%	75%	75%	50%	\$5,000
Monomoy Regional School District	70%	70%	70%	70%	70%	70%	70%	\$5,000
Nauset Regional School District	50%	50%	50%	50%	50%	50%	0%	\$2,000
North Sagamore Water District	75%	75%	50%	50%	50%	50%	75%	\$5,000
Sandwich Water District	90%	90%	90%	90%	90%	90%	90%	\$2,000
Town of Barnstable	50%	50%	0%	0%	0%	0%	None	\$2,000
Town of Bourne	75%	75%	0%	0%	0%	0%	75%	\$5,000
Town of Brewster	50%	50%	50%	50%	50%	50%	0%	\$1,000
Town of Chatham	50%	50%	50%	50%	50%	50%	50%	\$5,000
Town of Dennis	60%	60%	50%	50%	50%	50%	60%	\$2,000
Town of Eastham	65%	65%	65%	65%	65%	65%	65%	\$5,000
Town of Falmouth	65-75%	50%	65-75%	50%	50%	50%	0%	\$1,000
Town of Harwich	75%	75%	50%	50%	50%	50%	0%	\$2,000
Town of Mashpee	75%	75%	75%	75%	75%	75%	75%	\$4,000
Town of Orleans	75%	75%	0%	0%	0%	0%	75%	\$2,000
Town of Provincetown	70-80%	70-80%	0%	0%	0%	0%	None	\$1,000
Town of Sandwich	75%	75%	50%	50%	50%	50%	75%	\$2,000
Town of Truro	65%	65%	0%	0%	0%	0%	65%	\$1,000
Town of Wellfleet	50%	50%	50%	50%	50%	50%	50%	\$5,000
Town of Yarmouth	50%	50%	50%	50%	50%	50%	50%	\$5,000
Upper Cape Cod Regional Technical School	70%	70%	70%	70%	70%	70%	None	\$10,000
West Barnstable Fire District	75%	75%	75%	75%	75%	75%	75%	\$2,000

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Cape Cod Municipal Health Group

Benefit Types:

Medical and prescription drug benefits are provided to all eligible retirees through a variety of plans offered through the Cape Cod Municipal Health Group (CCMHG) provided by Blue Cross Blue Shield of Massachusetts, Harvard Pilgrim Health Plan and Tufts Health Plan. The CCMHG also provides contributory and voluntary dental coverage through Delta Dental.

Duration of Coverage:

Lifetime.

Dependent Benefits:

Medical, prescription drug, and dental.

Dependent Coverage:

Benefits are payable to a spouse for their lifetime, regardless of when the retiree dies.

Contribution rates:

CCMHG current premium rates are summarized below:

Non-Medicare Plans	Monthly Cost (eff. 7/1/2016)	Medicare Plans	Monthly Cost (eff. 1/1/2017)
BCBS Master Health Plus		Tufts Medicare Supplement with PDP Plus	\$363.00
Individual	\$1,426.00	BCBS Modex	\$356.00
2-person	2,856.00	Harvard Pilgrim Medicare Enhanced	\$320.00
Family	3,564.00	BCBS Managed Blue for Seniors	\$347.00
BCBS Blue Care Elect Preferred PPO		BCBS Medicare HMO Blue	\$365.00
Individual	\$945.00	Tufts Medicare Preferred HMO	\$296.00
2-person	1,895.00		
Family	2,365.00		
BCBS Network Blue HMO			
Individual	\$730.00		
2-person	1,464.00		
Family	1,954.00		
Harvard Pilgrim HMO			
Individual	\$741.00		
2-person	1,482.00		
Family	1,982.00		
Harvard Pilgrim PPO			
Individual	\$813.00		
2-person	1,626.00		
Family	2,151.00		
Dental Blue Premier			
Individual	\$39.00		
Double	77.00		
Family	101.00		

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Town of Bourne

Benefit Types:

Medical, prescription drug and dental benefits are provided to all eligible retirees through a variety of plans provided by Blue Cross Blue Shield of Massachusetts.

Duration of Coverage:

Lifetime.

Dependent Benefits:

Medical, prescription drug, and dental.

Dependent Coverage:

Benefits are payable to a spouse for their lifetime, regardless of when the retiree dies.

Contribution rates:

Current premium rates are summarized below:

**Monthly Cost
(eff. 7/1/2016)**

Non-Medicare Plans

BCBS Blue Care Elect Preferred PPO

Individual
Family

\$941.53
\$2,260.86

BCBS Network Blue HMO

Individual
Family

\$803.28
\$1,924.77

Totals

Medicare Plans

(eff. 1/1/2017)

BCBS Medex 2 + Blue Medicare RX

\$362.88

Dental Blue
Individual
Family

(eff. 7/1/2016)
\$37.62
\$100.84

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Employers Participating in the Group Insurance Commission (GIC) for Retired Teachers

Benefit Types: Medical and prescription drug benefits are provided to all eligible retirees through a variety of plans provided through the Commonwealth of Massachusetts GIC.

Duration of Coverage: Lifetime.

Dependent Benefits: Medical and prescription drug.

Dependent Coverage: Benefits are payable to a spouse for their lifetime, regardless of when the retiree dies.

Contribution rates: Current premium rates are summarized below:

	Contributions		
	Teachers retired on or before July 1, 1990	Teachers retired after July 1, 1990 through August 16, 2011	
	Monthly Premium	(10% of premium)	(15% of premium)
	as of 7/1/2016		
<u>Non-Medicare Plans</u>			
Fallon Health Select Care			
Individual	\$690.66	\$69.07	\$103.60
Family	1,657.54	165.75	248.63
Neighborhood Health Plan			
Individual	\$512.21	\$51.22	\$76.83
Family	1,357.32	135.73	203.60
Unicare/Comm Indemnity/CIC			
Individual	\$487.63	\$48.76	\$73.14
Family	1,170.35	117.04	175.55
<u>Medicare Plans</u>			
Unicare/Comm Indemnity OME/CIC	\$374.63	\$37.46	\$56.19
Totals			

SECTION 3: Supporting Information for the Barnstable County June 30, 2016 Valuation Under GASB 45 and 74

Plan Changes

Since the Prior Valuation:

The Town of Bourne made the following changes to their non-Medicare plans effective July 1, 2016:

- > A \$250/\$750 annual deductible was added.
- > The PCP copay was increased from \$15 to \$20.
- > The Specialist copay was increased from \$25 to \$35.
- > The Hospital copays were increased from \$250 to \$300/\$700.
- > The Outpatient Surgery copay was increased from \$50 to \$150.
- > The High Tech Imaging copay was increased from \$50 to \$100.
- > The Pharmacy copay was increased from \$10/20/35 double mail to \$10/25/50 retail and \$20/50/110 mail.
- > A telehealth rider was added.

8641551v8/04446.025

SECTION 4: Supplemental Information by Department for the June 30, 2016 Valuation Under GASB 45

**DEPARTMENT RESULTS – TOWN OF HARWICH
5.08% DISCOUNT RATE**

	Water	All Other	Total
Actuarial Accrued Liability by Participant Category			
1. Current retirees, beneficiaries and dependents	\$1,114,818	\$24,860,312	\$25,975,130
2. Current active members	<u>1,083,918</u>	<u>12,989,099</u>	<u>14,073,017</u>
3. Total as of July 1, 2016: (1) + (2)	\$2,198,736	\$37,849,411	\$40,048,147
4. Actuarial value of assets as of July 1, 2016	<u>0</u>	<u>535,428</u>	<u>535,428</u>
5. Unfunded actuarial accrued liability (UAAL) as of July 1, 2016: (3) - (4)	\$2,198,736	\$37,313,983	\$39,512,719
Annual Required Contribution for Fiscal Year Ending June 30, 2017			
6. Normal cost as of July 1, 2016	\$55,035	\$983,807	\$1,038,842
7. Adjustment for timing	<u>1,381</u>	<u>24,679</u>	<u>26,060</u>
8. Normal cost adjusted for timing: (6) + (7)	\$56,416	\$1,008,486	\$1,064,902
9. 30-year amortization of the unfunded actuarial accrued liability (UAAL) increasing at 3.5% per year	\$90,517	\$1,536,132	\$1,626,649
10. Adjustment for timing	<u>2,271</u>	<u>38,534</u>	<u>40,805</u>
11. Amortization payment adjusted for timing: (9) + (10)	\$92,788	\$1,574,666	\$1,667,454
12. Total Annual Required Contribution (ARC): (8) + (11)	149,204	2,583,152	2,732,356
13. Projected benefit payments for fiscal year ending June 30, 2017	\$66,468	\$1,799,811	\$1,866,279

Note: Adjustment for timing assumes payment in the middle of the fiscal year.