
Town of Duxbury Other Post-Employment Benefits



**Actuarial Valuation
June 30, 2012**



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SECTION I

MANAGEMENT SUMMARY

Introduction

This report presents the results of the actuarial valuation of the Town of Duxbury Other Post-employment Benefits as of June 30, 2012. The valuation was performed for the purpose of measuring the actuarial accrued liabilities associated with these benefits and calculating a funding schedule. These results are used in satisfying the requirements under the Governmental Accounting Standards Board Statement No. 45.

The valuation was based on participant data as of June 30, 2012 supplied by Duxbury and the Massachusetts State Teachers Retirement System. The provisions reflected in the valuation are based on Chapter 32B of the General Laws of the Commonwealth of Massachusetts and related statutes and the benefits provided by the Town.

We are pleased to present the results of this valuation. We are available to respond to any questions on the content of this report. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in inaccurate or misleading understanding of the results.

Respectfully submitted,
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January 16, 2013

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Summary of Actuarial Results

The actuarial values in this report were calculated consistent with the Governmental Accounting Standards Board (GASB) Statement No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, issued June 2004. Values at two discount rates are presented. The 7.50% discount rate represents the expected rate of return for a funded plan with a longer-term investment horizon and is based on our discussions with Duxbury officials. For an unfunded plan, the GASB Statement No. 45 calls for the use of a discount rate approximating the rate of return of Duxbury's general assets. The rate we used for Duxbury is 4.00%. The OPEB liability is extremely sensitive to this assumption. Use of the unfunded rate instead of the funded rate causes the Annual Required Contribution (ARC), Accrued Actuarial Liability (AAL), and the Normal Cost to increase dramatically.

The summary results are as follows:

- Actuarial Accrued Liability ("AAL") is the "price" attributable to benefits earned in past years. The total AAL as of June 30, 2012 (at 4.00% discount rate) is \$87,999,907. This is made up of approximately \$42.3 million for current active Duxbury employees and approximately \$45.7 million for Duxbury retirees, spouses and survivors.
- The Normal Cost is the "price" attributable to benefits earned in the current year. The Normal Cost as of June 30, 2012 (at the 4.00% discount rate) is approximately \$4.1 million.
- Based on a twenty-seven year funding schedule (at the 4.00% discount rate), the Fiscal 2012 contribution would be \$7,683,427. This figure is referred to as the Annual Required Contribution (ARC). This figure should be contrasted with the ARC using the fully funded 7.50% rate and a thirty year funding schedule of \$4,677,185. These compare to the pay-as-you-go contribution of the existing costs for current retirees of \$2,258,904. For an illustration of how payment of the ARC impacts the funding of the plan over time, please refer to the "Illustrative Funding Schedule" discussion beginning on page 15 and



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the accompanying table on page 33. The following table shows the breakdown of the Actuarial Accrued Liability between future retirees and current retirees, as well as the normal cost, at Duxbury's different discount rates:

Actuarial Results as of June 30, 2012	7.50% Rate	4.00% Rate
Current Actives	\$20,813,184	\$42,262,889
Current Retirees, Beneficiaries, Vesteds and Survivors	<u>\$30,783,061</u>	<u>\$45,737,018</u>
Total AAL	\$51,596,245	\$87,999,907
Total UAAL	\$51,596,245	\$87,999,907
Normal Cost	\$1,770,755	\$4,108,302
ARC (Uses 27 yrs for Unfunded, 30 Yrs for Funded)	\$4,677,185	\$7,683,427



Change from Prior Valuation

Duxbury's last valuation of its OPEB liability was done as of July 1, 2009. The following table provides a comparison of some of the key figures:

Category	6/30/2012 Figure	7/1/2009 Figure	% Change
AAL	\$88.0 million	\$66.7 million	+32.0%
Normal Cost	\$4.1 million	\$3.4 million	+19.6%
Amortization Cost	\$3.6 million	\$2.6 million	+36.3%
ARC	\$7.7 million	\$6.1 million	+26.8%
Pay-Go for Year 1	\$2.3 million	\$1.9 million	+17.9%

The following addresses the reasons behind these changes:

- 1) The valuation discount rate changed from 4.25% to 4.00%. This increased the NC 7% and the AAL by 5%.
- 2) Our mortality assumption was projected seventeen years to 2017 instead of 2009 as in the previous valuation. This change increased the NC by 9% and the AAL by 10%.
- 3) The participation rate (see discussion below) was changed from 87.5% to 75%. This reduced the NC about 14% and the AAL about 7%. Note that this change impacts only currently active employees.
- 4) Changes in claims, trends, and plan factors increased the NC about 1% and the AAL about 5%.
- 5) Changes in non-mortality assumptions (including Retirement rates, Withdrawal rates, and Disability rates) increased the NC about 18% and the AAL about 1%.
- 6) The change in the population added about 6% to the NC and 15% to the AAL.

Analysis of the change is complicated by the ending of the Commercial Indemnity plans, which have been much more expensive than the Commercial Managed Care Plans. This impacted actives (the NC and Active AAL) much more than the retiree AAL.



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The following table summarizes the changes in assumptions between the two valuations:

	Current Val (6/30/2012)	Prior Val (7/1/2009)
Mortality	Projected to 2017	Projected to 2009
Employee Part	75%	87.5%
Spouse %	60%	80%
Plans Pre-65	100% MC/0%IND;	80%MC/20%IND
Plans Post-65(Medicare Only)	99% IND/0% MC	99% IND/0% MC
Family % Pre-65/Post-65	42.5%/22.5%	30%/NA
Claims age 65 COMMC Blended	\$19,910/\$16,623	\$18,165/\$18,165
Claims age 65 COMIND Blended	\$27,455/\$21,923	\$21,999/\$21,999
Claims age 65 MEDMC/MEDIND	NA/\$3,774	\$4,597/\$4,752
Cumulative Trend Years 1-10		
Commercial MC	98%	77%
Commercial IND	Same as COMMC after year 1	106%
Medicare MC	NA	67%
Medicare IND	81%	81%
# Actives	567	554
# Retirees and Vested Terms	497	407
# Retirees and Spouses with Med	384	353



Valuation Methodology and Assumptions

VALUATION METHOD

The valuation of the other post-employment benefits is based upon the projected unit credit actuarial cost method. Under this method, future health care benefit costs (including Medicare reimbursements) are projected using assumed rates of annual health care cost increases (health care cost trend rates). The cost of future expected life insurance death benefits is added to the projected medical cost. The actuarial value of the future expected benefits is allocated proportionately over a health plan member's working lifetime.

A normal cost (or service cost) is determined for each year of the member's creditable service and is equal to the value of the future expected benefits divided by the total expected number of years of service. This is similar to a normal cost in a retirement actuarial valuation. The Actuarial Accrued Liability is the accumulated value of prior normal costs, similar to the actuarial accrued liability in a retirement actuarial valuation, and represents the liability associated with prior service.

GASB Statement No. 45

The actuarial cost method used in this valuation is consistent with the Governmental Accounting Standards Board (GASB) Statement No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, issued June 2004. It is one of the allowable cost methods specified in that accounting standard, and is the cost method most similar to the prescribed method of accounting for these benefits in the private sector described in the Financial Accounting Standards Board Statement 106 (FAS 106).

Difference Between FAS 106 and GASB Statement No. 45

The GASB Statement No. 45 differs in one important regard from the actuarial cost method described in the private sector accounting standard. In the FAS 106 methodology, benefits are considered to be fully earned in the first 10 years of service, since members become vested in



the retirement benefits in 10 years. Compared to the FAS 106 method, the GASB Statement No. 45 attribution method produces a lower accrued liability for future retirees. The cost of the benefit is spread over the expected working lifetime of the employee. This makes the cost of the benefit associated with the years of service the employee is providing. This is more appropriate for the public sector due to the relative permanence of public entities compared to private entities. There are other significant differences between the GASB Statement No. 45 and FAS 106, most noticeably in the choice of discount rate. The GASB Statement No. 45 discount rate assumption is discussed below.

ACTUARIAL ASSUMPTIONS

Details of the assumptions used in this valuation are shown in Section II. Here we present a brief discussion of the assumptions selected.

Demographic and Financial Assumptions

This includes a discount rate of 4.00% as well as mortality, disability, withdrawal and retirement rates. This discount rate applies to the scenario of an unfunded program. A fully funded program is when the employer contributes 100% of the ARC each year. An unfunded program is where the only amount contributed is used to pay benefits during the year so no assets accumulate. GASB Statement No. 45 indicates that the discount rate for an unfunded post employment benefit plan should be based on the degree to which the plan is funded. For an unfunded plan, the rate of return on the employer's general assets should be used. The rate we have used for this scenario is 4.00%. For a fully funded plan, GASB statement No. 45 allows one to use a long-term investment rate such as what would be used for a defined benefit pension fund. For a plan where the Town has been setting aside some funds toward the liability above the pay-as-you-go amount, but less than the full ARC ("partially" funded), a rate in between these two levels should be used. It should be noted that the rate of return assumption could change significantly in the future due to changes in the economic environment.

As of the valuation date, Duxbury had not made any contributions toward its OPEB liability. We recommend that Duxbury adopt a funding policy for its OPEB benefits. The GASB statement does not have a requirement for a formal funding policy document but indicates that



a formal funding policy should be adopted. We recommend that the Town detail its intent with either a written document or in the minutes of a meeting.

Should future contributions be recurring and material, future valuations would need to be run using a partially funded rate. Depending on the Town's investment policy, such a rate would likely be higher than the unfunded rate and lead to a lower AAL.

Health Care Plan Assumptions

Assumptions unique to post-retirement medical plans include initial annual health care costs and annual health care cost increase (trend) rates, Medicare eligibility, plan participation and coverage election rates.

- Current health care costs by age

Initial health care cost assumptions were derived from premium rates for the various health care plans in-force at June 30, 2012. Typically, we analyze the plans offered in terms of four different categories: whether the plan offered is Commercial (not integrated with Medicare) or supplemental to Medicare and whether the plan is Indemnity (where reimbursements are a function of billed charges) or Managed Care (where reimbursements are a function of negotiated contracts). Grouping the plans in this manner allows us to maintain a reasonable degree of granularity in our analysis. At the same time, it avoids the problem of a lack of credibility that often arises if one attempts to analyze every plan separately.

As of 6/30/2012, Duxbury had medical plans in three of these four categories: two Commercial Managed Care plans, one Commercial Indemnity plan and one Medicare Indemnity plan. Please refer to the "Plan Definition Table" on page 29 for more details. We were aware that, as of 9/1/2012, the single Commercial Indemnity plan was ending. So we put the current enrollees in this category to start and then moved them to Commercial Managed Care, the only alternative. This is consistent with Question and Answer 49 in the "Guide to Implementation of GASB Statements 43 and 45 on Other Postemployment Benefits".



For all of these groups, weighted-average costs for each plan grouping were calculated based on the actual Duxbury active and retiree population enrollments. For categories with more than one plan, costs were based on an average weighted by enrollment. However, in order to capture the effect of aging on health care costs, an assumption is required for the increase in health care costs as a person ages. We based our aging assumption on a study sponsored by the Society of Actuaries Health Section in August 2003. The effect of this aging assumption is illustrated in the table of “Initial Monthly Health Care Costs” in the Actuarial Methods and Assumptions section of this report. This method was applied only to the Commercial plans, since these plans incorporate both retirees and active employees. By age-grading the claim costs, we account for the subsidy of older employees by younger employees implicit in a flat premium rate (also referred to as the “Attributed Cost” of each employee). That is, the cost of an active 20-year old employee, for example, is much less than the cost of a retired 80-year old employee. But, the premiums charged the Town are flat – the same for both of these people. Thus, the 20-year old in our example is overcharged and the 80-year old is undercharged by a flat rate premium. Age-grading makes this subsidy or mischarge explicit in the claim costs at each age. For the purposes of the GASB valuation, this subsidy needs to be taken into account in determining the retiree liability and normal cost.

Medicare plans were also age-graded. While there is no subsidy between actives and retirees in these plans, there is still an escalating cost by age that needs to be reflected. In particular, it should be noted that from one year to the next, the cost of a person in these plans (as well as commercial plans) increases due to two factors: (1) year-over-year medical trends and (2) the fact that the person ages one more year. Without age-grading the Medicare costs, we would understate the rate of increase in costs and so end up with smaller liabilities and associated annual costs.

- **Cost trends**

The claim rates developed using the methodology described above must be projected over the life of each retiree. For this purpose we use trend rates calculated to reflect the general rate of increase in Health Care costs. We developed different trends for each of the categories of plans for which we also developed claim costs. These factors were applied to the premium-



based claim rates. In the case of Duxbury, we were aware of the rates increases going into effect at 9/1/2012 and we reflected these in our first year trends. Subsequent year trends were based on our general understanding of the trends.

It should be noted that premium rate increases typically include factors other than health care cost increases, such as aging of the covered population, that are reflected elsewhere in our valuation methodology. Therefore, premium rate increases are not themselves a proxy for health care trends. However, they do give some indication of the level of expected cost increases.

As is typical in post-retirement medical valuations, initially higher rates of health care cost trend are assumed to decrease over time to an ultimate rate consistent with long-term economic assumptions. Our general set of trend assumptions has Commercial Managed Care trends that begin at 9% and scale down to 5%. For Medicare, the Indemnity trend rates begin at 9% and scale down to 6% while the Managed Care trends begin 8% at and scale down to 5%. These different sets of trend rate reflect our belief that (1) Managed Care plans, with their negotiated pay levels and tighter controls, will exhibit lower trends than unmanaged Indemnity plans; and (2) Commercial plans will be subject to modestly higher trends than Medicare plans due to cost shifting induced by cutbacks in the federal government's payment of Medicare costs. These were the trends we used for our work, except for the first year trends, as mentioned above.

These trend rates should be thought of not as a forecast but as a reasonable progression of rates based on historic patterns. For many years, health care cost increases have been particularly volatile, and this actuarial assumption should be reviewed and, most likely, reset every year or two. Implicit in our health care cost trend assumptions is that the general rate of medical inflation will moderate due to economic pressure on insurers, employers, employees, retirees, government entities, and health care providers. As expectations of future health care cost increases change, they will be reflected in future valuations, resulting in actuarial gains/losses. These will be incorporated in the future costs and funding schedules. In this manner, there is a systematic means of adjusting to changes in the health care environment.

- [Sensitivity analysis](#)





The effect of increasing health care costs is extremely significant in an actuarial valuation of post-employment health benefits. As experience emerges the trend assumptions we have used are unlikely to be realized exactly. To illustrate the effect of different trend rates on the actuarial valuation results, we have included a sensitivity analysis of the effect on the actuarial accrued liability, normal cost and annual required contribution of a 1% increase or decrease in the health care cost trend assumption to the base (4.00%) unfunded scenario. We have also included a sensitivity analysis of the effect on the actuarial accrued liability, normal cost and annual required contribution of a 0.50% increase or decrease in the base unfunded discount rate assumption.

- **Timing**

All values discussed in this report are based on a June 30, 2012 valuation. This means that the first year of the valuation is June 30, 2012 through June 30, 2013. It is permissible, under GASB Statement No. 45, to use these values, without adjustment for interest or any other timing factor for a limited future time period. For an entity such as Duxbury, which will be doing a valuation every two years, the standard allows use of data “not more than twenty-four months before the beginning of the first of two years for which the valuation provides the ARC.” This means that it is acceptable for us to use the June 30, 2012 results without adjustment when discussing the 2012 and 2013 fiscal years. Included are projected costs for the fiscal year after the 2012 fiscal year. If you do not make any cash contributions or there are no significant plan changes you will be able to use the results for both fiscal years.



- Medicare

Medicare eligibility is an important assumption with regard to future costs. For those entities that have adopted Section of 18 of Chapter 32B of the code (as has Duxbury), we will assume that active employees who were hired after March 31, 1986 will be Medicare eligible due to their mandated participation in the Medicare program. Active employees prior to that employment date are assumed to be 85% Medicare eligible. Thus, we assume that 85% of those not Medicare eligible through the Town will obtain coverage through other employment or through their spouse. Such an assumption only applies to those hired by the Town prior to 4/1/1986. All employees hired after that date are automatically Medicare eligible. Thus, eventually, this 85% assumption will no longer be necessary.

Medicare Changes

The Medicare Prescription Drug, Improvement and Modernization Act of 2003 introduced significant changes to the Medicare program and its interaction with employer-sponsored post-retirement benefits. Medicare beneficiaries are able to participate in a voluntary, prescription drug coverage program. In order to encourage employers, including public-sector employers, to continue providing prescription drug coverage to retirees, the Act provides for a cash subsidy to employers whose prescription drug coverage is deemed to be actuarially equivalent to the new Medicare Part D drug coverage. This cash subsidy can be used to offset partially the cost of retiree medical benefits, including potentially reducing the accrued liability for a portion of the drug benefits provided by a retiree medical plan. The Act may have additional impact on retiree plan choices, as Medicare-eligible retirees may opt for the Part D coverage rather than an employer's plan options. Such changes, if they occur, may affect the selection of future actuarial assumptions.



GASB has indicated that the subsidy should not be included as part of the OPEB valuation. The reason being that the subsidy is considered general governmental revenue and as such is not earmarked towards the funding of OPEB benefits.

- **Health plan coverage election**

Assumptions must also be made regarding the participation in health plans when active members retire and when those already retired turn age 65. Using data supplied by Duxbury, Stone Consulting modeled the behavior of employees as they moved from being active to being retired or moved from being an under age 65 retiree to being an age 65+ retiree. Such modeling involved an analysis of the distribution of the plans chosen by current retirees, the possible plans available to those who will retire in the future, and our opinions about the likely future course of retiree medical care. Such models are applicable to actives and to retirees not yet age 65, since both of these groups will have the option to select plans at key ages. It should be kept in mind that these percentages are applicable even to actives not currently enrolled in a medical plan. The reason for this is that these people could change their behavior and enroll in a plan at retirement. The likelihood that they (or other actives) elect to do so is controlled by the participation assumption (see below). Some retiree groupings do not require any modeling. For example, retirees over age 65 are assumed to remain in the plans they have already selected. If they have opted out of Duxbury coverage, we assume they will continue to do so. Similarly, those retirees under age 65 already in Medicare plans are assumed to remain in those plans for life. These are people who are disabled or have certain medical conditions that qualify them for Medicare early. Pre age 65 retirees in Commercial plans are assumed to stay in their current plan until age 65. At that point, they may migrate to a different plan. We have modeled their possible choices at age 65 and reflected them in our assumptions. Active employees over age 65, once they retire, are assumed to make the same sorts of selections as retirees at age 65.



The following table shows the way we modeled the choices at each of the key ages.

Duxbury Participant Behavior at Key Ages			
Status	Age	Pre-65 Retirement	65+ Retirement
Active	Under 65	100% Commercial Managed Care 0% Commercial Indemnity	0% Medicare Managed Care 99% Medicare Indemnity 1% Commercial Managed Care
Active	65+	NA	0% Medicare Managed Care 99% Medicare Indemnity 1% Commercial Managed Care
Retired	Under 65	Current Plan	0% Medicare Managed Care 99% Medicare Indemnity 1% Commercial Managed Care or Actual Plan if already in Medicare
Retired	65+	NA	Current Plan

Participation

In addition to determining the choices that retirees will make among plans, there is also the issue of whether the retiree will elect coverage at all. The rate at which retirees elect coverage is called the “Participation” Rate. Stone Consulting conducted a study of Duxbury retirees to determine the historical frequency at which retirees elect to take medical coverage. Based on this study, we assumed that 75% of future eligible retirees and spouses of retirees will elect health plan coverage. For Life Insurance, we also assumed that 75% of future retirees will elect coverage. These percentages reflect both actual Duxbury participation to date as well as the likelihood that future participation rates will tend to drift up as alternative sources of coverage become less common.

It is also necessary to reflect the participation rate of spouses in the Medical plans. Spouses will not participate at the same rate as employees for various reasons. These can include the availability of coverage from their own employer and the cost of the spouse coverage on top of the employee’s coverage. We examined the number of spouses covered both pre-65 and post-65 and determined the implied percentage of spouses participating. Such analysis took into account that spouses may “participate” by virtue of being covered under family plans. It



was, again, done separately for Teachers and Non-teachers. The participation rate we developed was 60%. We should also note that our expected frequency of spouses for an employee who is retiring is 80%. In other words, we typically expect 8 out of 10 retiring employees to have a spouse. This level, 80%, is the maximum level of spousal participation in the retiree programs. But, as we said above, not all of these spouses will somehow be covered in the retiree programs. Consequently, we end up with the lower percentage listed above.

Data

The participant census data for the valuation study was supplied by the Duxbury Retirement System and the Massachusetts Teachers Retirement System. Participants include Duxbury active employees including teachers, retirees, disability retirees, surviving spouses and inactives. Similar to many other Massachusetts municipalities, Duxbury does allow inactive former employees with 10 or more years of service to qualify for a vested retirement benefit.

The participant census data was not audited by Stone Consulting, Inc. However, it was checked for reasonableness.

Summaries of active participants and Duxbury retiree census data are included in Section II.

Funding

There are alternative ways to plan for the payment of post-retirement health and life insurance benefits: continue to fund on a pay-as-you go method, contribute on an ad-hoc basis to a fund for this purpose, or develop a funding schedule in which the unfunded amount is amortized over some number of years. With the funding schedule, the normal cost must continue to be paid each year to keep current.

There is no legal requirement to prefund these post-employment benefit liabilities. Nor does GASB Statement No. 45 require actual prefunding; however, its accounting requirements will serve to highlight the substantial unfunded accrued liabilities associated with these benefits.



ILLUSTRATIVE FUNDING SCHEDULE

The GASB Statement No. 45 is designed to account for non-pension post-employment benefits using an approach similar to the accounting for retirement benefits. It develops an Annual Required Contribution (“ARC”) that is based on the Normal Cost plus an amortization of the Unfunded Actuarial Accrued Liability (“UAAL”). To the extent that actual contributions equal to the ARC are made by the employer to the post-employment health benefit plan, no additional liability will be required to be shown on Duxbury’s balance sheet. Employer contributions may be in the form of benefit or premium payments or contributions to a fund set aside for future benefit payments. Such a fund must meet the requirements set out in the accounting standard.

We have calculated an illustrative funding schedule for the other post-employment benefits, consistent with the GASB Statement No. 45. This funding schedule assumes that Duxbury funds 100% of the ARC and begins with Duxbury’s Fiscal Year 2012. The full schedule is shown in Section II. We have used a 30-year schedule for this exhibit since there has been no prior funding.

Development of Funding Schedule and Annual Required Contribution

The contribution amount under a fully funded scenario using the 7.50% discount rate for Fiscal 2012 is \$4,677,185. Part of this comes from the amortization of the June 30, 2012 Unfunded Actuarial Accrued Liability of \$51,596,245. Because there are no funds set aside, it is equal to the total actuarial accrued liability (AAL). The UAAL is amortized over thirty years using an increasing amortization payment at the rate of assumed payroll increase due to inflation (3.25%). The funding contribution is the amortization payment plus the projected normal cost. As noted earlier, under the GASB Statement No. 45, thirty years is the maximum amortization period allowed. Shorter periods of time and/or other amortization patterns could be considered. The thirty-year funding schedule shown produces the lowest possible initial fiscal year contribution under the GASB parameters. It should be noted that the contribution is assumed to be made at the end of the fiscal year, so the first contribution is assumed to be made June 30, 2012. The amount of the amortization payment in the first year is \$2,906,430.



For the purposes of this schedule, we have not adjusted the June 30, 2012 liability for timing by applying interest to bring it to any future date.

Yearly contributions will increase, as both normal cost and amortization payments increase each year.

The remaining part of the ARC is the cost of the current year's benefit accrual, the normal cost, of \$1,770,755. To fully fund the ARC, Duxbury would need to make a cash contribution of \$2,418,281 in addition to the pay-as-you-go amount of \$2,258,904.

Cash Flow Consideration

We have analyzed the cash flow of a funded post-employment medical trust by comparing the expected payouts of claims over the thirty-year period to expected contribution levels. If the actuarial assumptions are met, the funded amounts will be sufficient to cover annual benefit payments each year. Prior to adopting a funding schedule we recommend additional analysis be conducted to examine the effects of potential actuarial gains and losses on the cash flow.

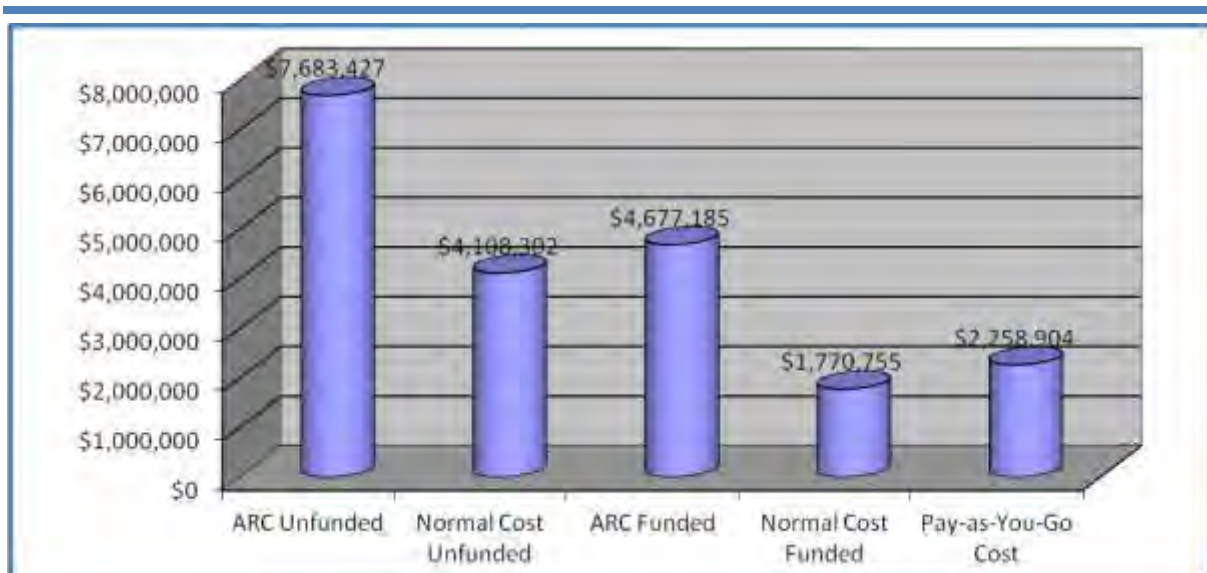
FUNDING VERSUS PAY-AS-YOU-GO VERSUS PARTIAL FUNDING

Currently, most Massachusetts governmental entities are paying for their post-employment medical benefits on a pay-as-you-go basis. This means that no amount in excess of the actual cost for the year is paid. All such entities must report figures for GASB Statement No. 45 based on the unfunded discount rate. Duxbury has elected, to date, to follow this course of action.

In order to understand the impact of not funding versus funding completely, a comparison of the ARCs and normal costs (the contribution amount if the UAAL was \$0) under both scenarios, and the pay-as-you-go amount is illustrated in the following chart:



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The chart depicts the advantage to the entity of even a partial funding policy, since the ARC and Normal Cost are significantly higher under the unfunded scenario.

As can be seen in the funding schedule, the retiree medical plan's normal cost will increase each year, so that by the time the initial unfunded liability is fully amortized, the required annual contribution will be substantially higher than is illustrated here for the first year. The pay-as-you-go costs will also increase dramatically as more and more employees retire. A projection of annual expected retiree pay-as-you-go costs is included with the funding schedule.

It is very important to understand that, in order to utilize the higher discount rate that goes with the fully funded or partially funded scenarios, there must be a "Funding Policy." That is, the Town must intend to continue to make payments and, in the future, must actually make them. Should the policy not be followed in future years, an adjustment to the discount rate would need to be made. As the figures above illustrate clearly, there is an iterative relationship between the degree of funding and the amounts that must be shown as liabilities, amortization payments, and normal cost figures. Lower funding levels lead to higher amounts for these key figures.

The partial subsidy of prescription drug benefit costs that is available under the Medicare



Prescription Drug, Improvement and Modernization Act of 2003 is a potential source of funds for a portion of the retiree medical costs. To the extent that this subsidy reimburses Duxbury for drug benefits it would already be paying for, the additional cash from the subsidy could be used to help pre-fund future benefits. The magnitude of any future subsidy is only a small portion of the additional cost to fund. Other plan design changes, such as a carve-out of prescription drug coverage, may yield greater opportunities for savings.*

DETERMINATION OF THE NET OPEB OBLIGATION (NOO)

The Statement does not require Duxbury to put its entire Actuarial Accrued Liability on its books immediately as a liability. Rather, a cost is applied to its net assets each year. Over time this cost, which is called the OPEB Cost, will add up to the total liability. The total liability at any point in time is called the Net OPEB Obligation (NOO). For the first year of funding, the OPEB Cost and ARC are identical. Amounts contributed toward the cost of other post-employment benefits must then be deducted. These amounts include: 1) actual premiums paid; 2) the extra implied costs or “implicit subsidy” associated with covering retirees; 3) any additional amounts paid during the year. The Net OPEB Cost is the OPEB Cost less these amounts. For year one, where there was no prior NOO on the financial statement, the Net OPEB Cost was the same as the Net OPEB Obligation.

Starting with year two, the OPEB Cost must recognize not only the Normal Cost and Amortization Cost for the year but also add interest on the prior year’s NOO as well as subtract the Annual Required Contribution (ARC) adjustment to prevent double counting the amortization of the prior year’s NOO. The interest and the ARC adjustments somewhat offset each other so the net impact is not large. The total contributions are then subtracted from the OPEB Cost and the result is added to the prior year’s NOO. In this manner, the difference between each year’s ARC and the contributions are accumulated.

Please refer to the following table on pages 21-22 in the following discussion.

The unfunded actuarial accrued liability as of 6/30/2012, under the assumption of no funding, would be \$87,999,907. This is the case as of this date, since Duxbury had not, as of this date,



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made any contributions above the pay-as-you-go amounts. The following chart illustrates the ARC, Pay-As-You-Go Cost, Annual OPEB Cost, and Net OPEB Obligation for the years 2009 through 2016 under the unfunded scenario. The Annual OPEB cost is the ARC plus an adjustment for interest not included in the ARC calculation. The Net OPEB Obligation is the accumulation of the Annual OPEB Cost minus any contributions. This is the amount that is subtracted from the Net Assets on your balance sheet. In the unfunded case, the contributions are the attributed pay-as-you-go amounts. Note that the rate used for interest is the 4.00% unfunded rate.



CALCULATION OF NET OPEB OBLIGATION⁽¹⁾

"Funding" Schedule at 4.00%

Fiscal Year	UAL	Normal Cost	Amort.	ARC	Interest on NOO ⁽³⁾	ARC Adjust.	OPEB Cost	Total Contribs. ²	Change in NOO	NOO
2009	\$86,337,000	\$6,283,000	\$3,405,000	\$9,688,000	NA	NA	\$9,688,000	\$2,720,000	\$6,968,000	\$6,968,000
2010	\$66,675,000	\$3,436,000	\$2,623,000	\$6,059,000	\$296,000	\$274,000	\$6,081,000	\$1,916,000	\$4,165,000	\$11,133,000
2011	\$71,135,000	\$3,582,000	\$2,885,000	\$6,467,000	\$473,000	\$452,000	\$6,488,000	\$2,068,000	\$4,420,000	\$15,553,000
2012	\$87,999,907	\$4,108,302	\$3,575,125	\$7,683,427	\$622,120	\$631,863	\$7,673,683	\$2,258,904	\$5,414,779	\$20,967,779
2013	\$93,488,898	\$4,272,634	\$3,930,412	\$8,203,046	\$838,711	\$881,516	\$8,160,240	\$2,439,565	\$5,720,675	\$26,688,455
2014	\$99,184,116	\$4,443,539	\$4,321,456	\$8,764,996	\$1,067,538	\$1,162,817	\$8,669,717	\$2,681,249	\$5,988,468	\$32,676,923
2015	\$105,038,413	\$4,621,281	\$4,750,504	\$9,371,785	\$1,307,077	\$1,477,858	\$9,201,004	\$2,885,455	\$6,315,549	\$38,992,472
2016	\$111,103,484	\$4,806,132	\$5,224,870	\$10,031,003	\$1,559,699	\$1,833,701	\$9,757,000	\$3,107,130	\$6,649,870	\$45,642,342

¹Figures for 2009-2011 years from Duxbury Financial reports. Note that the 2011 financial report rounded this amount to \$15,555,000.

²For all years, Total Contributions are equal to the attributed premiums paid including the implicit subsidy. Reflects a single

³ NOO = Net OPEB Obligation



CALCULATION OF NET OPEB OBLIGATION (Alternative Presentation)

	Fiscal 2013	Fiscal 2012	Fiscal 2011	Fiscal 2010	Fiscal 2009
AAL	\$93,488,898	\$87,999,907	\$71,135,000	\$66,675,000	\$86,337,000
Service Cost	\$4,272,634	\$4,108,302	\$3,582,000	\$3,436,000	\$6,283,000
Amortization of unfunded accrued liability	\$3,930,412	\$3,575,125	\$2,885,000	\$2,623,000	\$3,405,000
ARC	\$8,203,046	\$7,683,427	\$6,467,000	\$6,059,000	\$9,688,000
Interest on Prior Year's NOO	\$838,711	\$622,120	\$473,000	\$296,000	\$0
ARC Adjustment	\$881,516	\$631,863	\$452,000	\$274,000	\$0
OPEB Cost	\$8,160,240	\$7,673,683	\$6,488,000	\$6,081,000	\$9,688,000
Premiums and Implicit Subsidy Paid	\$2,439,565	\$2,258,904	\$2,068,000	\$1,916,000	\$2,720,000
Cash contributions	\$0	\$0	\$0	\$0	\$0
Total Contributions	\$2,439,565	\$2,258,904	\$2,068,000	\$1,916,000	\$2,720,000
Change in NOO	\$5,720,675	\$5,414,779	\$4,420,000	\$4,165,000	\$6,968,000
NOO Beginning of Fiscal Year	\$20,967,779	\$15,553,000	\$11,133,000	\$6,968,000	\$0
NOO End of Fiscal Year	\$26,688,455	\$20,967,779	\$15,553,000	\$11,133,000	\$6,968,000



Implementation

According to the GASB Statement No. 45, its provisions would be effective for Duxbury fiscal years beginning after December 15, 2007. The timing is due to Duxbury being a “Tier 2” government under GASB 34. In the first fiscal year of adoption, Fiscal 2009, and using the original valuation figures, Duxbury recorded a liability of \$6,968,000 on its balance sheet. Duxbury’s contributions (including benefit payments) for other post-employment benefits were less than the Annual Required Contribution (“ARC”) determined in accordance with the GASB standard and described above. By the end of Fiscal 2011, Duxbury had recorded a figure of \$15,553,000 for its NOO.

This report provides similar information for FY 2012 and beyond. For future years, a similar liability will need to be recorded. This liability would also reflect interest on any prior funding deficiencies. The total actuarial liability is determined by a valuation to be performed at least every two years. The total actuarial liability is reduced by any assets set aside to pre-fund the post-retirement benefits, with the resulting unfunded actuarial liability being amortized according to a funding schedule similar to that illustrated in this report.

To be considered a funded system, the plan assets must be “segregated and restricted in a trust, or equivalent arrangement, in which (a) employer contributions to the plan are irrevocable, (b) assets are dedicated to providing benefits to retirees and their beneficiaries, and (c) assets are legally protected from creditors of the employers or plan administrator, for the payment of benefits in accordance with the terms of the plan.” (GASB 45, p. 47, “Plan Assets”). Therefore, for Duxbury to receive “credit” under the GASB accounting standard for assets set aside to pre-fund post-retirement benefits, they must be segregated in a trust or other account that is not subject to use for any other purpose by Duxbury.



Recommendations and Comments

Post-employment medical benefits are a significant long-term liability that is only now starting to be addressed by Massachusetts governmental employers. In managing this liability, any governmental entity needs to consider the parameters that can significantly influence the level of the liability. To facilitate such a review, we recommend that Duxbury maintain a continuing group that is cognizant of the relevant financial and employee benefits issues raised by GASB Statement No. 45 that will provide leadership to the Town. We would recommend that the group review the following:

- 1) Funding Policy: As previously discussed, the funding policy is critical to the valuation not only because it impacts the funds backing the liability but also because it impacts the discount rate that is used to calculate all of the relevant figures. Duxbury needs to bear in mind that it is the formulation of a funding policy that is essential, not simply the contribution of funds. Of course, if a funding policy is developed, it needs to be implemented, not just formulated. Given that the Town will be making a contribution in FY 2013, it needs to attend to this issue as soon as possible. We recommend that the Town review its funding policy each year.
- 2) Plan Design: One of the major factors influencing costs is the design of the plans that Duxbury offers to retirees. To the extent that any part of these plans changes materially, costs may either increase or decrease.

In order to keep costs under control, the Town should review the design of all its medical plans annually. Changes in plan characteristics such as deductibles, coinsurance levels, out-of-pocket maximums, and covered services can help mitigate the impacts of ever-increasing medical costs or amplify these costs. In addition, the Town should review the networks it is using to be sure that it is getting the most competitive reimbursement levels available.



- 3) Contribution Levels: The extent to which the Town subsidizes the cost of retiree benefits is one of the most significant factors in the ultimate costs. Currently, retired Duxbury employees and their spouses pay 50% of the premium cost for their Commercial medical insurance depending upon the plan. The Commercial contributions are the highest that can be required for a Massachusetts municipal entity. Thus, Duxbury's contribution level is much higher than most of its peer entities. The lower end of employee contribution rates is in the 10%-15% range, while 25% is about the average. Contribution levels (like benefit levels) have a double impact on costs. First off, there is a direct relationship between contributions and costs in that higher contribution levels mean that more of the cost of the plan is born by the Town. Secondly, higher contribution levels lead to higher participation rates because the plan becomes less costly to the retiree. In the case of cities and towns where a substantial portion of the medical costs are paid by the employer, participation rates tend to be very high. Duxbury's participation level of 75% is roughly in line with its contribution requirements.

In general, a very-well subsidized plan will have many participants enrolled at a high cost. Also, to the extent that other employers are cutting back or eliminating their programs, there is increased likelihood that a favorably subsidized plan will be elected by retirees, since no coverage or only very expensive coverage may be available from other sources such as their spouse's employer. There has been a very definite move toward reducing the subsidies paid by Massachusetts public entities.

- 4) Eligibility: The extent to which retirees are eligible for benefits is another variable that very directly impacts costs. Duxbury should review its eligibility criteria each year to be sure that they are accord with Town goals for controlling costs and for providing well-deserved benefits for those who have worked for the Town. Retirement system policies can also affect the eligibility for benefits. In the case of Duxbury, the Town pays for medical benefits for those who reach ten years of service even if they do not



retire from the Town immediately upon separation from service. This will produce a higher liability and ARC for Duxbury than if only those actually retiring from the Town were covered.

In addition to reviewing the above items regularly, we recommend that the Town continue working toward an organized method of keeping its data. This is an issue faced by virtually all public entities with respect to GASB Statement No. 45. Some of the typical issues are:

- 1) Be sure that it has a record of those eligible for coverage who do not take coverage. This should cover not only actives who are not enrolled but retired employees who opted out.
- 2) To the extent possible, make sure that all databases can be tied together by a single identifier, such as social security number or employee number. Some entities keep certain data by, for example, social security number, but organize other data on some other basis. This greatly increases the time and effort to tie all the relevant pieces of data together. This need is particularly acute when the records for those in the school system are not kept by Duxbury directly.



SECTION II

ACTUARIAL VALUATION DETAILS

Population Data

*A. DISTRIBUTION BY AGE: RETIREES, BENEFICIARIES, AND SURVIVORS
(Includes retirees with life only or no coverage)*

Age	Number ⁽¹⁾
0-19	0
20-24	0
25-29	0
30-34	1
35-39	0
40-44	2
45-49	4
50-54	12
55-59	26
60-64	79
65-69	128
70-74	99
75-79	58
80-84	48
85-89	19
90-94	20
95-99	0
100+	1
TOTAL	497

⁽¹⁾ Includes retirees who are eligible for medical or with life coverage in addition to beneficiaries and survivors with medical coverage.



*B. FUTURE RETIREES – ACTIVE PARTICIPANTS, CITY AND SCHOOL SYSTEM
COMBINED*

OF PARTICIPANTS*

Current Plan	Medicare Eligible	Not Medicare Eligible	Total
No Medical/ Unknown	120	3	123
Indemnity	10	5	15
Managed Care	397	32	429
TOTAL	527	40	567

* “Pre-Medicare eligible” means hired March 31, 1986 or before and “Medicare eligible” means hired after March 31, 1986. Employees hired March 31, 1986 or before do not contribute to Medicare.



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PLAN DEFINITION TABLE⁽¹⁾

Name of Plan	Type of Plan	Ind Rate	Retirees Enrolled	Fam Rate	Retirees Enrolled	EE Cont %
PPO	Commercial Managed Care	\$662.49	51	\$1,657.14	19	50.00%
HMO	Commercial Managed Care	\$598.96	19	\$1,497.38	11	50.00%
Masterhealth Plus	Commercial Indemnity	\$1,127.30	3	\$2,820.52	2	50.00%
Medex	Medicare Indemnity	\$396.00	279	NA	NA	50.00%
Life	Life	\$1.04	240	N/A	N/A	50.00%

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C. DISTRIBUTION BY AGE AND SERVICE: ACTIVE PARTICIPANTS

Age Group	0-4	5-9	10-15	15-19	20-24	25-29	30-34	35-39	40+	Total
0-19	1	0	0	0	0	0	0	0	0	
20-24	2	1	0	0	0	0	0	0	0	3
25-29	37	7	1	0	0	0	0	0	0	45
30-34	17	21	8	2	0	0	0	0	0	48
35-39	29	19	22	2	0	0	0	0	0	72
40-44	21	18	14	14	1	1	0	0	0	69
45-49	23	15	18	13	5	0	0	0	0	74
50-54	21	19	18	8	9	9	2	0	0	86
55-59	12	13	27	7	9	12	6	4	0	90
60-64	5	10	13	8	7	5	4	3	2	57
65-69	1	4	2	4	5	2	0	1	0	19
70-74	0	0	0	0	1	1	0	0	0	2
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	1	0	0	0	1
85-89	0	0	0	0	0	0	0	0	0	0
90-94	0	0	0	0	0	0	0	0	0	0
95-99	0	0	0	0	0	0	0	0	0	0
100+	0	0	0	0	0	0	0	0	0	0
TOTAL	169	127	123	58	37	31	12	8	2	567



SUMMARY OF RESULTS

Actives	
- Already in Medicare	0
- Pre-Medicare Coverage	40
- Post-Medicare Coverage	<u>527</u>
Total	567
Retired, Disabled, Survivors and Beneficiaries	478
Terminated Vesteds	19

	At 4.00% discount
Active Employees	\$42,262,889
Current Retirees	\$45,737,018
TOTAL	\$87,999,907
Unfunded Accrued Liability	
June 30, 2012	\$87,999,907
Normal (Service) Cost as of	
June 30, 2012	\$4,108,302





SUMMARY OF RESULTS

(continued)

	At 4.00% discount
27-yr amortization of UAAL	\$3,575,125
Normal Cost	\$4,108,302
TOTAL	\$7,683,427

Expected Claims

- Fiscal 2012 \$2,258,904

Schedule of Funding Progress Other Post-Employment Benefits

(Dollars in Thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) [Projected Unit Credit] (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (b-a)/c)
7/1/2007	\$0	\$86,337	\$86,337	0.00%	NA	NA
7/1/2009	\$0	\$66,675	\$66,675	0.00%	\$35,171	189.6%
6/30/2012	\$0	\$88,000	\$88,000	0.00%	\$37,469	234.9%



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Thirty-Year Funding Schedule at 7.50%					
Fiscal Year	Normal Cost ¹	Amortization ²	Contribution	Year-End AAL	Projected Annual Benefit Cost ³
2012	1,770,755	2,906,430	4,677,185	52,341,552	2,258,904
2013	1,903,562	3,000,889	4,904,450	53,041,213	2,439,565
2014	2,046,329	3,098,417	5,144,746	53,688,505	2,681,249
2015	2,199,803	3,199,116	5,398,919	54,276,093	2,885,455
2016	2,364,789	3,303,087	5,667,876	54,795,981	3,107,130
2017	2,542,148	3,410,438	5,952,585	55,239,459	3,270,374
2018	2,732,809	3,521,277	6,254,086	55,597,046	3,318,980
2019	2,937,770	3,635,718	6,573,488	55,858,427	3,525,182
2020	3,158,102	3,753,879	6,911,981	56,012,389	3,612,492
2021	3,394,960	3,875,880	7,270,840	56,046,747	3,824,180
2022	3,649,582	4,001,846	7,651,428	55,948,268	3,971,231
2023	3,923,301	4,131,906	8,055,207	55,702,589	3,976,705
2024	4,217,548	4,266,193	8,483,741	55,294,125	4,236,521
2025	4,533,864	4,404,845	8,938,709	54,705,977	4,376,671
2026	4,873,904	4,548,002	9,421,906	53,919,823	4,498,804
2027	5,239,447	4,695,812	9,935,259	52,915,812	4,554,376
2028	5,632,405	4,848,426	10,480,831	51,672,440	4,519,417
2029	6,054,836	5,006,000	11,060,836	50,166,423	4,671,952
2030	6,508,948	5,168,695	11,677,643	48,372,557	4,757,571
2031	6,997,120	5,336,677	12,333,797	46,263,571	4,904,678
2032	7,521,904	5,510,119	13,032,023	43,809,960	5,039,770
2033	8,086,046	5,689,198	13,775,245	40,979,819	5,119,967
2034	8,692,500	5,874,097	14,566,597	37,738,651	5,262,385
2035	9,344,437	6,065,005	15,409,443	34,049,169	5,283,489
2036	10,045,270	6,262,118	16,307,388	29,871,079	5,262,875
2037	10,798,665	6,465,637	17,264,302	25,160,851	5,182,475
2038	11,608,565	6,675,770	18,284,335	19,871,461	5,171,150
2039	12,479,208	6,892,733	19,371,940	13,952,133	5,033,041
2040	13,415,148	7,116,747	20,531,895	7,348,041	4,932,607
2041	14,421,284	7,348,041	21,769,325	0	4,819,240

¹ Assumes 7.50% annual increase in normal cost and a static group of actives

² Assumes 3.25% annual increase in amortization payment

³ The Pay-As-You-Go amount is for the current group of actives and retirees and is shown for the calendar year. It does not include any future hires. It is not directly comparable to the funding contribution but it included for illustrative purposes only. It does illustrate in the short-term, the estimated amount of claims costs for retirees. However, the retiree amount is expected to grow as new employees retire or become disabled.



Breakdown for Groupings and Enterprise Funds*

Water

Fiscal Year	UAAL	Normal Cost	Amort.	ARC	OPEB Cost	Contrib.	Change in NOO	NOO
2009	\$547,587	\$105,343	\$21,598	\$126,941	\$126,941	\$2,264	\$124,677	\$124,677
2010	\$422,885	\$57,613	\$16,635	\$74,247	\$74,247	\$1,594	\$72,653	\$197,330
2011	\$499,291	\$60,061	\$19,640	\$79,701	\$80,326	\$1,721	\$78,604	\$275,935
2012	\$584,708	\$69,956	\$23,755	\$93,710	\$93,538	\$647	\$92,891	\$368,825
2013	\$680,191	\$72,754	\$28,596	\$101,350	\$100,597	\$707	\$99,891	\$468,716
2014	\$782,342	\$75,664	\$34,087	\$109,751	\$108,078	\$777	\$107,301	\$576,017

Pool

Fiscal Year	UAAL	Normal Cost	Amort.	ARC	OPEB Cost	Contrib.	Change in NOO	NOO
2009	NA	NA	NA	NA	NA	NA	NA	NA
2010	NA	NA	NA	NA	NA	NA	NA	NA
2011	NA	NA	NA	NA	NA	NA	NA	NA
2012	\$60,611	\$18,795	\$2,462	\$21,257	\$21,257	\$5	\$21,252	\$21,252
2013	\$82,577	\$19,546	\$3,472	\$23,018	\$22,975	\$6	\$22,969	\$44,221
2014	\$106,202	\$20,328	\$4,627	\$24,956	\$24,798	\$1,152	\$23,646	\$67,866



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All Other

Fiscal Year	UAAL	Normal Cost	Amort.	ARC	OPEB Cost	Contrib.	Change in NOO	NOO
2009	\$85,789,413	\$6,177,657	\$3,383,402	\$9,561,059	\$9,561,059	\$2,717,736	\$6,843,323	\$6,968,000
2010	\$66,252,115	\$3,378,387	\$2,606,365	\$5,984,753	\$6,006,753	\$1,914,406	\$4,092,347	\$11,133,000
2011	\$70,635,709	\$3,521,939	\$2,865,360	\$6,387,299	\$6,407,674	\$2,066,279	\$4,341,396	\$15,553,000
2012	\$87,354,588	\$4,019,552	\$3,548,908	\$7,568,459	\$7,558,889	\$2,258,252	\$5,300,637	\$20,577,702
2013	\$92,726,131	\$4,180,334	\$3,898,344	\$8,078,677	\$8,036,668	\$2,438,852	\$5,597,816	\$26,175,518
2014	\$98,295,572	\$4,347,547	\$4,282,742	\$8,630,289	\$8,536,842	\$2,679,321	\$5,857,521	\$32,033,039

*Figures for 2009-2011 years from Duxbury Financial Reports



Sensitivity Analysis

The results of any actuarial valuation are sensitive to the assumptions used. That is, a change in an actuarial assumption will produce a change in the actuarial accrued liability and/or normal cost each year of the valuation. To illustrate this sensitivity, we performed valuations in which we changed two different inputs: the trend rate and the discount rate.

A) Trend Rate Sensitivity

For postretirement medical plans in particular, the calculated actuarial values are highly sensitive to the assumed rate of health care cost trend. This is due to the compounding effect of the annual trend rates assumed for medical costs, as opposed to pension valuations where benefit levels typically remain fixed.

The following table illustrates the effect on our valuation results of a 1% increase or decrease in the assumed rates of health care cost trend in each year. The base scenario uses the unfunded discount rate of 4.00%.

As of June 30, 2012		Health Care Cost Trend Rates		
	As Reported (4.00%)	+1% Each Year	-1% Each Year	
Liability for:				
• Future Retirees	\$42,262,889	\$53,611,429	\$33,780,454	
• Current Retirees, Beneficiaries, and Survivors	<u>\$45,737,018</u>	<u>\$52,053,859</u>	<u>\$40,025,676</u>	
Total AAL	\$87,999,907	\$105,665,288	\$73,806,130	
Normal Cost	\$4,108,302	\$5,433,600	\$3,154,251	
Annual Required Contribution for Fiscal Year 2012:	\$7,683,427	\$9,726,407	\$6,152,733	

The cumulative effect of a 1% increase in health care cost trend increases the AAL by approximately 20%, the normal cost by 32%, and the ARC by 27%. A 1% decrease in trend



would decrease the AAL by 16%, the normal cost by 23% and the ARC by 20%.

There is the likelihood – based on historical experience – of significant deviations from the smooth rates of health care cost increase typically projected in any actuarial valuation. Therefore, emerging experience under the plan is likely to differ from the assumptions made as of any valuation date. This will produce actuarial gains and losses each year, even if the underlying assumptions remain reasonable for the future. Amortization of gains and losses will affect the updated funding schedule calculated at any point in the future.



B) Discount Rate Sensitivity

We also examined the sensitivity of the various key numbers to changes in the discount rate. For this testing, we varied the discount rate by 0.50%, or in other words, we used rates of 3.50% and 4.50%. The following table shows the results we obtained:

As of June 30, 2012		Discount Rates	
	As Reported (4.00%)	Plus 0.50% (4.50%)	Minus 0.50% (3.50%)
Liability for:			
• Future Retirees	\$42,262,889	\$37,672,049	\$47,659,868
• Current Retirees, Beneficiaries, and Survivors	<u>\$45,737,018</u>	<u>\$42,933,667</u>	<u>\$48,845,308</u>
Total AAL	\$87,999,907	\$80,605,716	\$96,505,176
Normal Cost	\$4,108,302	\$3,587,179	\$4,732,115
Annual Required Contribution for Fiscal Year 2012:	\$7,683,427	\$7,062,837	\$8,419,883

Thus, the cumulative effect of a 0.50% decrease in the discount rate is to increase the AAL by approximately 10%, the normal cost by 15%, and the ARC by 10%. A 0.50% increase in the discount rate would decrease the AAL by 8%, the normal cost by 13% and the ARC by 8%. It is prudent, and GASB Statement No. 45 requires, an updated actuarial valuation be performed periodically. For an entity of Duxbury's size, a new valuation will be required at least every two years.



Actuarial Methods and Assumptions

1.	Actuarial Cost Method	Costs are attributed between past and future service using the Projected Unit Credit cost method. For attribution purposes, benefits are assumed to accrue over all employee service until decrement.
2.	Interest Rate/Discount Rate	4.00% per year net of investment expenses for an unfunded program.
3.	Amortization Method	Closed twenty-seven year amortization (remainder of initial thirty-year amortization). Uses level percentage of payroll (using a 3.25% annual rate of increase). Note that the amortization period was reset to 30 years for the funded valuation results.
4.	Asset Valuation Method	Not applicable, since there are no assets.
5.	Mortality	Actives: The RP-2000 Mortality Tables (Sex-distinct) for Employees projected 17 years. Retirees: The RP-2000 Mortality Tables (Sex-distinct) for Healthy Annuitants projected 17 years. Disabled: The RP-2000 Mortality Tables (Sex-distinct) for Healthy Annuitants projected 17 years and set forward 2 years No additional mortality projection is assumed.



Actuarial Methods and Assumptions
(Continued)

6a. Withdrawal Prior to Retirement Based on years of service.
(all except teachers)

Years of Service	Groups 1,2	Group 4
0	15.00%	1.50%
1	12.00%	1.50%
2	10.00%	1.50%
3	9.00%	1.50%
4	8.00%	1.50%
5	7.60%	1.50%
6	7.50%	1.50%
7	6.70%	1.50%
8	6.30%	1.50%
9	5.90%	1.50%
10	5.40%	1.50%
11	5.00%	0.00%
12	4.60%	0.00%
13	4.10%	0.00%
14	3.70%	0.00%
15	3.30%	0.00%
16	2.00%	0.00%
17	2.00%	0.00%
18	2.00%	0.00%
19	2.00%	0.00%
20	2.00%	0.00%
21	1.00%	0.00%
22	1.00%	0.00%
23	1.00%	0.00%
24	1.00%	0.00%
25	1.00%	0.00%
26	1.00%	0.00%
27	1.00%	0.00%
28	1.00%	0.00%
29	1.00%	0.00%
30+	0.00%	0.00%



Actuarial Methods and Assumptions (Continued)

6b. Withdrawal Prior to Retirement for Teachers

Male Teachers	Service:	0	5	10
	Age			
	25	12.00%	4.50%	1.00%
	35	11.00	5.00	1.50
	45	9.50	5.00	2.00
	55	7.5	4.50	2.50
Female Teachers	25	10.00%	9.00%	5.00%
	35	12.00	8.40	4.10
	45	8.90	4.70	2.40
	55	8.00	3.20	2.00

7. Eligibility for Vested Post-Retirement Medical Benefits upon Withdrawal	Members of the Plymouth County Retirement System and the Massachusetts Teachers Retirement System whose last year of employment was with the Town of Duxbury who have 10 years of Service are eligible for a benefit.
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8. Disability Prior to Retirement	The rates shown at the following sample ages illustrate the assumption regarding the incidence of disability. Disability is assumed to be 55% ordinary and 45% accidental for Group 1 and 10% ordinary and 90% accidental for Group 4 and 55% ordinary and 45% accidental for Teachers.
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Age	Rate of Disability		
	Groups 1 and 2	Group 4	Teachers
20	0.01%	0.10%	0.004%
25	0.02%	0.20%	0.005%
30	0.03%	0.30%	0.006%
35	0.06%	0.30%	0.006%
40	0.10%	0.30%	0.010%
45	0.15%	1.00%	0.030%
50	0.19%	1.25%	0.050%
55	0.24%	1.20%	0.080%
60	0.28%	0.85%	0.100%



Actuarial Methods and Assumptions
(Continued)

9a. Rates of Retirement (Non-Teachers)

The rates shown at the following ages illustrate the assumption regarding the incidence of retirement, once the member has achieved 10 years of service:

Rates of Retirement			
<i>Age</i>	<i>Groups 1 and 2 Male</i>	<i>Groups 1 and 2 Female</i>	<i>Group 4</i>
50	1.00%	1.50%	2.00%
51	1.00%	1.50%	2.00%
52	1.00%	2.00%	2.00%
53	1.00%	2.50%	5.00%
54	2.00%	2.50%	7.50%
55	2.00%	5.50%	15.00%
56	2.50%	6.50%	10.00%
57	2.50%	6.50%	10.00%
58	5.00%	6.50%	10.00%
59	6.50%	6.50%	15.00%
60	12.00%	5.00%	20.00%
61	20.00%	13.00%	20.00%
62	30.00%	15.00%	25.00%
63	25.00%	12.50%	25.00%
64	22.00%	18.00%	30.00%
65	40.00%	15.00%	100.00%
66	25.00%	20.00%	NA
67	25.00%	20.00%	NA
68	30.00%	25.00%	NA
69	30.00%	20.00%	NA
70	100.00%	100.00%	NA



Actuarial Methods and Assumptions
(Continued)

9b. Rates of Retirement: Teachers

Male Teachers			
Service: Age	<20 Years	20-29 years	>29 years
50	N/A	1.0%	2.0%
51	N/A	1.0%	2.0%
52	N/A	1.0%	2.0%
53	N/A	1.0%	2.0%
54	N/A	1.0%	2.0%
55	3.0%	3.0%	6.0%
56	8.0%	5.0%	20.0%
57	15.0%	8.0%	35.0%
58	15.0%	10.0%	50.0%
59	20.0%	20.0%	50.0%
60	15.0%	20.0%	50.0%
61	30.0%	25.0%	50.0%
62	20.0%	30.0%	40.0%
63	30.0%	30.0%	40.0%
64	40.0%	30.0%	40.0%
65	40.0%	40.0%	50.0%
66	40.0%	30.0%	50.0%
67	40.0%	30.0%	50.0%
68	40.0%	30.0%	50.0%
69	40.0%	30.0%	50.0%
70	100.0%	100.0%	100.0%



Actuarial Methods and Assumptions
(Continued)

9b. Rates of Retirement Teachers (cont'd)

Female Teachers			
Service: Age	<20 years	20-29 years	>29 years
50	0.0%	1.5%	2.0%
51	0.0%	1.5%	2.0%
52	0.0%	1.5%	2.0%
53	0.0%	1.5%	2.0%
54	0.0%	1.5%	2.0%
55	2.0%	3.0%	6.0%
56	2.0%	3.0%	15.0%
57	8.0%	7.0%	30.0%
58	10.0%	7.0%	35.0%
59	15.0%	11.0%	35.0%
60	20.0%	16.0%	35.0%
61	20.0%	20.0%	35.0%
62	25.0%	30.0%	40.0%
63	24.0%	30.0%	30.0%
64	20.0%	30.0%	35.0%
65	30.0%	30.0%	35.0%
66	30.0%	30.0%	35.0%
67	30.0%	30.0%	30.0%
68	30.0%	30.0%	30.0%
69	30.0%	30.0%	30.0%
70	100.0%	100.0%	100.0%



Actuarial Methods and Assumptions (Continued)

10. Initial Claim Costs

Age	Managed Care Commercial Individual	Managed Care Commercial Blended ⁽¹⁾	Indemnity Commercial Individual	Indemnity Commercial Blended ⁽¹⁾	Managed Care Medicare	Indemnity Medicare
55	\$8,091.67	\$13,581.12	\$10,709.03	\$18,727.66	NA	\$2,574.26
60	\$9,656.88	\$16,208.19	\$12,780.53	\$22,350.25	NA	\$3,072.22
65	\$11,862.48	\$16,122.98	\$15,699.56	\$21,923.01	NA	\$3,773.90
70	\$13,751.87	\$18,690.95	\$18,200.09	\$25,414.78	NA	\$4,374.99
75	\$15,558.98	\$21,147.09	\$20,591.73	\$28,754.49	NA	\$4,949.90
80	\$17,178.37	\$23,348.10	\$22,734.94	\$31,747.28	NA	\$5,465.08
85	\$18,054.64	\$18,054.64	\$23,894.65	\$23,894.65	NA	\$5,743.86

- ⁽¹⁾ Blended rates below 65 are 42.5% Family and 57.5% Individual. Blended rates 65 and higher are 22.5% Family and 77.5% Individual. Individual rates are used for all participants 81 and higher.

11. Trend Rates By Plan

Year	Commercial Managed Care	Commercial Indemnity	Medicare Indemnity
2012	12.21%	-32.36%	0.00%
2013	8.50%	8.50%	8.50%
2014	8.00%	8.00%	8.00%
2015	7.50%	7.50%	7.50%
2016	7.00%	7.00%	7.00%
2017	6.50%	6.50%	6.50%
2018	6.00%	6.00%	6.00%
2019	5.50%	5.50%	6.00%
2020	5.00%	5.00%	6.00%
2021+	5.00%	5.00%	6.00%



Actuarial Methods and Assumptions
(Continued)

12. Medicare Eligibility	Employees: 100% if hired March 31, 1986 or after; 85% if hired pre-March 31, 1986 Spouses: 100%
13. Participation Rates	<p>Current retirees and spouses are assumed to continue the same coverage they have as of the valuation date. No future election of coverage is assumed for those retirees and spouses who currently have not elected coverage.</p> <p>All Retirees: 75% of the active employees eligible for post-employment medical benefits are assumed to elect Medical Coverage immediately upon retirement.</p> <p>75% of the active employees eligible for post-employment medical benefits are assumed to elect Life Insurance coverage immediately upon retirement.</p> <p>For all Retirees: Of those electing coverage, 80% are assumed to have a covered spouse at retirement. Of this 80%, 60% are assumed to participate,</p> <p>Participants with no or unknown current coverage (e.g. active employees who do not currently participate in Duxbury's medical plans) are assumed to elect retiree coverage at the same rates as currently covered active employees. Medicare-eligible retirees currently under age 65 are assumed to elect a Medicare plan option at age 65.</p>
14. Expenses	Administrative expenses are included in the per capita medical cost assumption.



Actuarial Methods and Assumptions (Continued)

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|--------------------------------|--|
| 15. Plan Enrollment Rates | These are the rates are which retirees select medical plans, given that they enroll in a medical plan. The selection patterns follow the table below. |
| 16. Projections | The June 30, 2012 valuation was not adjusted for timing when determining the funding schedule. This means that the Pay-as-you-go amount as well as the Actuarial Valuation results have not been modified for interest or any other timing factor in our presentation. |
| 17. Teachers | Members of the Massachusetts State Teachers Retirement System are sometimes referred to as “teachers”. |
| 18. Section 9 ½ of Chapter 32B | No current or future payments or receipts are assumed due to past service or future service with other Chapter 32 entities. |
| 19. Valuation Date | June 30, 2012 |

Principal Plan Provisions Recognized in Valuation



*Town of Duxbury
Other Post-Employment Benefits Valuation
as of June 30, 2012*

1.	Eligibility for Benefits	<p>Current retirees, beneficiaries and spouses of Duxbury are eligible for medical benefits.</p> <p>Current employees or spouses who retiree with a benefit from the Duxbury.</p> <p>Survivors of Duxbury employees and retirees are also eligible for medical benefits.</p>
2.	Medical Benefits	Various medical plans offered by Duxbury to its own employees.
3.	Life Insurance	Duxbury retirees are eligible for a \$5,000 life insurance benefit offered by Duxbury. Retirees pay 50% of the cost or \$0.52 per month for their coverage.
4.	Retiree Contributions	Based on data provided by Duxbury.



Glossary

Actuarial Accrued Liability	The portion, as determined by a particular Actuarial Cost Method, of the present value of benefits which is not provided for by future Normal Costs.
Actuarial Assumptions	Assumptions as to the occurrence of future events affecting Other Post-employment Benefits such as: mortality rates, disability rates, withdrawal rates, and retirement rates, the discount assumption, and the trend rates.
Actuarial Cost Method	A procedure for determining the Actuarial Present Value of Total Projected benefits and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal and an Actuarial Accrued Liability.
Amortization Payment	The portion of the OPEB contribution designed to pay interest and to amortize the Unfunded Actuarial Accrued Liability.
Annual OPEB Cost	The accrual-basis measure of the periodic cost of an employer's participation in a defined-benefit OPEB plan.
Annual Required Contribution (ARC)	The employer's periodic contributions to a defined benefit OPEB plan, calculated in accordance with the parameters defined in GASB 45. This is defined as the sum of the Normal Cost and the Amortization payment.
Commercial Plans	Plans designed to cover the medical expenses of those not otherwise covered by Medicare.
GASB	The Governmental Accounting Standards Board is the organization that establishes financial reporting standards for state and local governments.



Glossary
(continued)

Investment return Assumptions (Discount Rate)	The rate used to adjust a series of future benefit payments to reflect the time value of money. Under GASB 45, this rate is related to the degree to which the OPEB program is funded.
Healthcare Cost Trend Rate	The rate of change in per capita health claims costs over time as a result of factors such as medical inflation, utilization of healthcare services, the intensity of the delivery of services, technological developments, and cost-shifting.
Medicare Plans	Medical plans sold to those over 65 who are also covered by Medicare. These plans are supplemental to the Medicare plan, which is considered primary.
Net OPEB Obligation	The cumulative difference, since the effective date of GASB 45, between the annual OPEB cost and the employer's contributions to the plan.
Normal Cost	The portion of the Actuarial Present value of plan benefits that is allocated to a valuation year by the Actuarial Cost Method.
OPEB	Other Postemployment benefits other than pensions. This does not include plans such as severance plans or sick-time buyouts.
Pay-as-You-Go	The amount of benefits paid out to plan participants during the year.
Per Capita Claims Cost	The current average annual cost of providing postretirement health care benefits per individual.
Unfunded Actuarial Accrued Liability	The portion of the Actuarial Accrued Liability that is not covered by plan assets. For a plan that is completely unfunded, this amount is equivalent to the Actuarial Accrued Liability.
Valuation Date	The point from which all future plan experience is projected and as of which all present values are calculated.



Acknowledgement of Qualifications

We, Lawrence Stone and Kevin Gabriel, are consultants for Stone Consulting, Inc. and are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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