

January 1, 2015

Actuarial Valuation Report

City of Leominster  
Other Post-Employment Benefits

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## SECTION I - MANAGEMENT SUMMARY

### Introduction

This report presents the results of the actuarial valuation of the City of Leominster Other Post-employment Benefits as of January 1, 2015. 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 January 1, 2015 supplied by Leominster, the Leominster Retirement System, and the Massachusetts State Teachers Retirement. 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 City.

This actuarial valuation involves estimates about the probabilities of events as well as the projection of amounts far into the future. Our figures should be considered a “best estimate” of the future events and not a prediction. As such, actual results are unlikely to mirror our results. All amounts determined in this valuation will be subject to continual review as actual results are compared to past estimates and new estimates are made about future events.

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.

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,

STONE CONSULTING, INC.  
August 29, 2016

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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 several discount rates are presented. This reflects the different funding approaches to different City departments. The Water and Sewer departments are being fully funded. After consultation with City officials, we used a 5.50% discount rate to value these liabilities. This rate represents the expected rate of return for a funded plan with a longer-term investment horizon and reflects Leominster's investment philosophy. For the plan covering all other employees (henceforth called the "City" plan), which is only partially funded, we used a rate of 4.75%. The derivation of this rate is discussed later in the report. The OPEB liability is extremely sensitive to the discount rate assumption. Use of the partially funded rate instead of the funded rate causes the Annual Required Contribution (ARC), Accrued Actuarial Liability (AAL), and the Normal Cost to increase dramatically. The liability is also very sensitive to the investment allocation employed by the City. A more aggressive asset allocation will lead to a higher discount rate and, thus, lower liabilities.

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 January 1, 2015 (at the 5.50% and the 4.75% discount rates) is \$186,446,346. This is made up of approximately \$86.2 million for current active Leominster employees and approximately \$100.2 million for Leominster retirees, spouses and survivors.
- The Normal Cost is the "price" attributable to benefits earned in the current year. The Normal Cost as of January 1, 2015 (at the 5.50% and the 4.75% discount rates) is approximately \$6.8 million.
- Based on a twenty-four year funding schedule for the Water and Sewer at a 5.50% discount rate and a twenty-four year funding schedule for the City at a 4.75% discount rate, the Fiscal 2015 contribution would be \$15,586,142. This figure is referred to as the Annual Required Contribution (ARC). These compare to the pay-as-you-go contribution of the existing costs for current retirees of \$5,927,732. 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 12 and the accompanying table on page 35. The following table shows the breakdown of the Actuarial Accrued Liability between future retirees and current retirees, as well as the normal cost, at Leominster's different discount rates.

Actuarial Results as of January 1, 2015	4.75% / 5.50% Rate*
Current Actives	\$86,207,070
Current Retirees, Beneficiaries, Vesteds and Survivors	\$100,239,276
Total AAL	\$186,446,346
Funding	\$7,724,531
Total Unfunded AAL (UAAL)	\$178,721,815
Normal Cost	\$6,837,245
ARC (Uses 24 yrs for Funded; 24 yrs for Partially Funded)	\$15,586,142

\* 4.75% is the discount rate for the City and 5.50% is the discount rate for the Water and Sewer

### Change from Prior Valuation

Leominster's last valuation of its OPEB liability was done as of January 1, 2013. The following table provides a comparison of some of the key figures:

Category	1/1/2015 (4.75% / 5.50%)	1/1/2013 Projected to 1/1/2015 (4.30% / 6.25%)	% Change
AAL	\$186.4 Million	\$202.6 million	-8.0%
Assets	\$7.7 Million	\$7.9 million	-2.6%
UAAL	\$178.7 Million	\$194.6 million	-8.2%
Normal Cost	\$6.8 Million	\$8.8 million	-22.3%
Amortization Cost	\$8.7 Million	\$9.1 million	-3.7%
ARC	\$15.6 Million	\$17.9 million	-12.2%
Pay-As-You-Go for Year 1	\$5.9 Million	\$6.2 million	-4.2%

The following addresses the reasons behind these changes:

- 1) The changes in the discount rates decreased the Normal Cost by 11% and decreased the AAL by 7%.
- 2) Mortality was on a generational basis instead of being projected to 2018. This added about 15% to the Normal Cost and about 11% to the AAL.
- 3) Changes in claims and trends decreased the Normal Cost by 16% and decreased the AAL by 5%. This is based on an analysis of the City population only.
- 4) The change in the population decreased the Normal Cost by 2% and increased the AAL by 3%. This is based on an analysis of the City population only.

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

	Current Val (1/1/2015) (4.75%/5.50%)	Prior Val (1/1/2013) (4.30%/6.25%)
Mortality	Generational Projection	Projected to 2018
Retiree Participation	90%	90%
Participating Spouse %	60%	65%
Plans Pre-65	100% MC/0%IND	100% MC/0%IND
Plans Post-65(Medicare Only) <sup>(1)</sup>	90% IND/10% MC;	87% IND/12% MC;
Family % Pre-65/Post-65	50%/30%	55%/15%
Claims age 65 COMMC Blended (Pre-65/Post-65)	\$21,689/\$17,521	\$20,243/\$12,742
Claims age 65 COMIND Blended (Pre-65/Post-65)	NA	NA
Claims age 65 MEDMC/MEDIND (Pre-65/Post-65)	\$2,292/\$3,117	\$2,227/\$3,240
Cumulative Trend Years 1-10		
Commercial MC	76%	82%
Commercial IND	NA	98%
Medicare MC	76%	66%
Medicare IND	75%	77%
Dental	60%	60%
# Actives	1131	1135
# Retirees and Vested Terms	1167	948
# Retirees and Spouses with Med	873	822

Table abbreviations:

- COMMC: Commercial Managed Care
- COMIN: Commercial Indemnity
- MEDMC: Medicare Managed Care
- MEDIN: Medicare Indemnity
- MC: Managed Care
- IND: Indemnity

<sup>(1)</sup> Remainder of plans elected are commercial plans.

## 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

These include discount rates of 4.75% and 5.50% as well as mortality, disability, withdrawal and retirement rates. The 5.50% discount rate applies to the scenario of a fully funded program and reflects Leominster’s investment strategy. A fully funded program is when the employer contributes 100% of the ARC each year. The 4.75% discount rate applies to the scenario of a partially funded program. A partially funded program is where an amount greater than the pay-as-you-go value is contributed each year, but not the ARC required to fund fully. GASB Statement No. 45 indicates that the discount rate for a post employment benefit plan should be based on the degree to which the plan is funded. 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. After discussions with Leominster officials, we have used a 5.50% for this scenario. This is lower than our usual assumption and reflects Leominster’s investment allocation. For a partially funded plan, a rate between the fully funded plan and a completely unfunded plan (only the pay-as-you-go amount is contributed) should be used. The derivation of this rate is discussed in the next section.

- Derivation of the Partially Funded Rate

As described above, the Leominster City plan is partially funded. An amount greater than the pay-as-you-go cost but less than the full ARC is contributed each year. In order to determine the appropriate discount rate to use for such a plan, one must “solve” for an interest rate between an unfunded plan (which would use a 4.00% rate) and a fully funded plan. This work requires an analysis of the difference between the ARC and the amount paid for various interest rates. We developed actual figures at certain key interest rates first. This group of figures was then used to develop a cubic polynomial approximation to the entire curve relating the discount rate to the difference between the ARC and the amount funded. The following table shows the data we used along with the approximation developed by the polynomial. Note that we have used data only through 5.50%, since this is the fully funded rate we are actually using.

Discount Rate	ARC	Pay-As-You-Go	ARC-PAYG	Difference	Polynomial
4.00%	\$17,337,799	\$5,780,378	\$11,557,421	\$0	-\$421,042
4.25%	\$16,580,704	\$5,780,378	\$10,800,326	\$757,095	\$753,274
4.50%	\$15,920,164	\$5,780,378	\$10,139,786	\$1,417,635	\$1,642,182
4.75%	\$15,343,716	\$5,780,378	\$9,563,338	\$1,994,083	\$2,287,908
5.00%	\$14,748,420	\$5,780,378	\$8,968,042	\$2,589,379	\$2,732,675
5.50%	\$13,746,230	\$5,780,378	\$7,965,852	\$3,591,569	\$3,188,230

Based on an annual funding amount for the year of \$2,250,000 the polynomial approximation gives a rate of approximately 4.75%. This is the rate that we are recommending.

It should be noted that these rates could change significantly in the future due to changes in the economic environment. In addition, the partially funded rate and the fully funded rate could change significantly should Leominster alter its funding policy.



We generally recommend that a municipal entity adopt a funding policy. This is particularly necessary for Leominster, which is funding its OPEB benefits. If Leominster has not already done so, we recommend that this policy be formalized. The GASB statement does not have a requirement for a formal funding policy document but indicates that a formal funding policy should be adopted. Thus, we recommend that the City, including the enterprise funds, detail its intent with either a written document or in the minutes of a meeting. It should be understood, that, the discount rate used would need to reflect the investment strategy used.

Assuming future contributions continue to be recurring and material, future valuations would need to be calculated using either a fully funded or a partially funded rate. The extent of the funding would determine which rate would be used.

### 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.

### Impact of New Pension Eligibility Rules

Starting with employees hired April 2, 2012 and later (referred to as “Tier 2” employees), Commonwealth of Massachusetts municipal retirees will have new retirement eligibility rules. Under these rules, we expect a change in retirement patterns, with people retiring later. We have reflected this change in our valuation and, thus, developed different retirement patterns for the Tier 2 retirees. We have not changed disability or withdrawal assumptions for the Tier 2 employees. Assumptions for Tier 1 employees (those hired under the old rules) are not impacted.

- 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 January 1, 2015. 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 January 1, 2015, Leominster had medical plans in three of these four categories: two Commercial Managed Care plans, one Medicare Indemnity plan, and two Medicare Managed Care plans. Please refer to the “Plan Definition Table” on page 29 for more details.

For all of these plan categories, weighted-average costs for each plan grouping were calculated based on the actual Leominster active and retiree population enrollments. Enrollments for the Water Department, Sewer Department, and rest of the City were combined for this purpose, since the plans do not vary by department. For plan categories with more than one plan, costs were based on an

average weighted by enrollment. 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 Claim 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 City 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.

Leominster also has a dental plan. This plan was age-graded in a manner similar to the Medical plans. However, the rate of increase by age is steep and the age at which the increases in annual claims stop is lower.

- 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.

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 5% while the Managed Care trends begin 8% at and scale down to 5%. The rate at which the indemnity plans scale down is slower than for the managed care plans. 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, where we used the actual premium changes for 2015.

Our general set of Dental trends begin at 7% and scale down to 5%. As with the medical plans, the trend rate we used for the first year was based on actual rates for 2015.

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 (4.75%/5.50%) discount 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 (4.75%/5.50%) discount rate assumption.

- Timing

All values discussed in this report are based on a January 1, 2015 valuation. This means that the first fiscal year of the valuation is July 1, 2014 to June 30, 2015. 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 Leominster, 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 January 1, 2015 results without adjustment when discussing the 2015 and 2016 Fiscal years. Included are projected costs for the fiscal year after the 2015 Fiscal year. If there are no significant plan changes or demographic changes or cash contributions that differ from those assumed, 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 Leominster), 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 City will obtain coverage through other employment or through their spouse. Such an assumption only applies to those hired by the City prior to 4/1/1986. All employees hired after that date are automatically Medicare eligible. 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 Leominster, 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. For this analysis, all departments were combined, since the plans available to all Leominster retirees are the same, regardless of department.

This model is 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 Leominster 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 model was the same for City employees and those of the Water and Sewer Departments.

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

Leominster Participant Behavior at Key Ages

Status	Age	Pre-65 Retirement	65+ Retirement
Active	Under 65	Commercial Managed Care: 100% Commercial Indemnity: 0%	Medicare Managed Care: 10% Medicare Indemnity: 90% Commercial Managed Care: <1%
Active	65+	NA	Medicare Managed Care: 10% Medicare Indemnity: 90% Commercial Managed Care: <1%
Retired	Under 65	Current Plan	Medicare Managed Care: 10% Medicare Indemnity: 90% Commercial Managed Care: <1% 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 reviewed Leominster retiree data to determine the historical frequency at which retirees elect to take medical coverage. Based on this review, we assumed that 90% of future eligible retirees and spouses of retirees will elect health plan coverage. For Dental Insurance, we also assumed that 60% of future retirees will elect coverage. For Life Insurance, we assumed that 90% of future retirees will elect coverage. These percentages reflect both actual Leominster 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. These participation rates do not vary by department.

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. The participation rate we developed was 60%. We should also note that our expected frequency of spouses for an employee who is retiring typically is 80%. In other words, we typically expect 8 out of 10 retiring employees to have a spouse. However not all of these spouses will opt to participate. Thus, we developed the lower participation rate of 60%.

### Data

The participant census data for the valuation study was supplied by the City of Leominster, the Leominster Retirement System, and the Massachusetts Teachers Retirement System. Participants include Leominster active employees including teachers, retirees, disability retirees, surviving spouses. We should note that, like many Massachusetts municipal entities, Leominster does allow Inactive former employees with 10 or more years of service to qualify for a vested post-retirement health benefit.

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

Summaries of active participants and Leominster 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 other 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 Leominster’s statement of assets. 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 is based on the assumption that Leominster funds 100% of the ARC and begins with Leominster's Fiscal Year 2015 and has a length of 30 years. It assumes actual funding to date. The full schedule is shown in Section II.

#### Development of Fully Funded Funding Schedule and Annual Required Contribution

In order to develop a Fully Funded Schedule we used a rate of 5.50% rate for all participants. This is an ideal rate assuming full funding and an allocation of assets similar to what might be seen in the typical pension plan. All departments including Water and Sewer, were assumed to pay off the liabilities over 30 years. The initial contribution amount under this discount rate scenario is \$12,451,582. The UAAL is then 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 mid-fiscal year.

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 \$5,551,679.

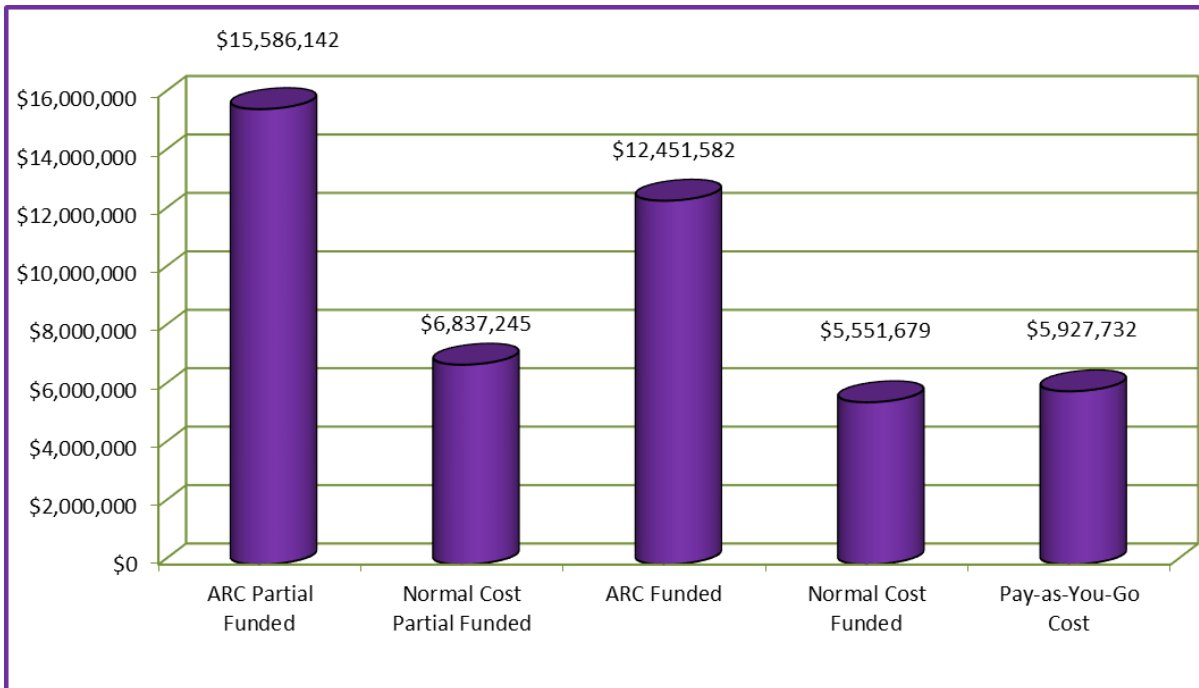
#### Cash Flow Consideration

We have analyzed the cash flow of a funded other 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. Leominster has elected, to date, not to follow this course of action. Instead, it is fully funding the Water and Sewer Departments and partially funding the rest of the City.

In order to understand the impact of fully funding only some Departments while partially funding the “City” people versus fully funding all Departments and also the impact of the more conservative investment approach Leominster is using, a comparison of the ARCs and normal costs under both scenarios, and the pay-as-you-go amount is illustrated in the following chart:



The chart depicts the advantage to Leominster of fully funding all departments at 5.50%, since the ARC and Normal Cost are significantly higher under the current 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 City must intend to continue to make payments and, in the future, must actually make them. Thus, it will be necessary for Leominster to establish a long-term policy in order to reduce the interest rate. As the figures above illustrate clearly, there is an iterative relationship between the degree of funding, the investment strategy, 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 Leominster 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 or an Employer Group Waiver Plan (EGWP), may yield greater opportunities for savings.

#### DETERMINATION OF THE NET OPEB OBLIGATION (NOO)

The Statement does not require Leominster 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 tables on pages 16-23 in the following discussion.

We have shown schedules for the Water Department, Sewer Department, and City separately. We have also shown a grand total page. The charts illustrates the ARC, Pay-As-You-Go Cost, Annual OPEB Cost, and Net OPEB Obligation for the years 2009 through 2016 the scenario appropriate to the particular department. Thus, the Water and Sewer Departments are shown at the 5.50% rate, while the rest of the City is shown at the 4.75% rate. The Grand Total page simply adds the other pages together, so it has mixed interest rates in it. 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 including the Pay-As-You-Go contribution (expected claims cost offset by retiree contributions, not annual premium). This is the amount that is subtracted from the Net Assets on your balance sheet.

**ALL LEOMINSTER: Calculation of Net OPEB Obligation**

"Funding" Schedule at 4.75%/5.50%

Fiscal Year	UAAL	Normal Cost	Amort.	ARC	Interest on NOO	ARC Adjust.	OPEB Cost	Total Contribs. <sup>(2)</sup>	Change in NOO	NOO <sup>(3)</sup>
2009 <sup>(1)</sup>	\$154,771,951	\$7,738,358	\$5,715,918	\$13,454,276	NA	NA	\$13,454,276	\$4,967,616	\$8,486,660	\$8,486,660
2010 <sup>(1)</sup>	\$164,344,918	\$8,086,584	\$5,930,265	\$14,016,849	\$381,900	\$323,106	\$14,075,643	\$5,494,707	\$8,580,936	\$17,067,596
2011 <sup>(1)</sup>	\$212,007,537	\$8,713,746	\$8,597,829	\$17,311,575	\$725,373	\$692,165	\$17,344,782	\$6,653,639	\$10,691,143	\$27,758,739
2012 <sup>(1)</sup>	\$223,308,380	\$9,470,154	\$9,348,375	\$18,818,529	\$1,179,746	\$1,162,066	\$18,836,209	\$9,170,651	\$9,665,558	\$37,424,297
2013	\$178,919,128	\$8,094,088	\$7,803,219	\$15,897,307	\$1,602,943	\$1,625,454	\$15,874,796	\$8,566,664	\$7,308,132	\$44,732,429
2014	\$186,255,171	\$8,443,877	\$8,395,131	\$16,839,008	\$1,897,483	\$2,001,346	\$16,735,145	\$8,571,814	\$8,163,331	\$52,895,760
2015	\$178,721,815	\$6,837,245	\$8,748,897	\$15,586,142	\$2,496,648	\$2,580,523	\$15,502,266	\$8,877,732	\$6,624,534	\$59,520,294
2016	\$184,950,764	\$7,162,862	\$9,379,058	\$16,541,919	\$2,804,130	\$3,007,147	\$16,338,902	\$9,000,593	\$7,338,309	\$66,858,603
2017	\$191,601,925	\$7,503,991	\$10,086,627	\$17,590,618	\$3,148,735	\$3,507,468	\$17,231,886	\$9,524,355	\$7,707,531	\$74,566,134

<sup>1</sup> Figures for 2009-2014 (boxed area) from Leominster's Financial Reports.

<sup>2</sup> For all years, Total Contributions are equal to the attributed premiums paid including the implicit subsidy.

<sup>3</sup> NOO = Net OPEB Obligation

**ALL LEOMINSTER: Calculation of Net OPEB Obligation (Alternative Presentation)**

	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014 <sup>(1)</sup>	Fiscal 2013 <sup>(1)</sup>	Fiscal 2012 <sup>(1)</sup>	Fiscal 2011 <sup>(1)</sup>
AAL	\$206,840,180	\$196,425,885	\$186,446,346	\$191,522,571	\$181,090,368	\$223,308,380	\$206,840,180
Assets	\$15,238,255	\$11,475,121	\$7,724,531	\$5,267,400	\$2,171,240	\$0	\$15,238,255
UAAL	\$191,601,925	\$184,950,764	\$178,721,815	\$186,255,171	\$178,919,128	\$223,308,380	\$191,601,925
Service Cost	\$7,503,991	\$7,162,862	\$6,837,245	\$8,443,877	\$8,094,088	\$9,470,154	\$7,503,991
Amortization of UAAL	\$10,086,627	\$9,379,058	\$8,748,897	\$8,395,131	\$7,803,219	\$9,348,375	\$10,086,627
ARC	\$17,590,618	\$16,541,919	\$15,586,142	\$16,839,008	\$15,897,307	\$18,818,529	\$17,590,618
Interest on NOO (+)	\$3,148,735	\$2,804,130	\$2,496,648	\$1,897,483	\$1,602,943	\$1,179,746	\$3,148,735
ARC Adjustment (-)	\$3,507,468	\$3,007,147	\$2,580,523	\$2,001,346	\$1,625,454	\$1,162,066	\$3,507,468
OPEB Cost	\$17,231,886	\$16,338,902	\$15,502,266	\$16,735,145	\$15,874,796	\$18,836,209	\$17,231,886
Premiums and Implicit Subsidy Paid	\$6,824,355	\$6,300,593	\$5,927,732	\$5,896,814	\$5,731,580	\$7,004,761	\$6,824,355
Cash contributions	\$2,700,000	\$2,700,000	\$2,950,000	\$2,675,000	\$2,835,084	\$2,165,890	\$2,700,000
Total Contributions	\$9,524,355	\$9,000,593	\$8,877,732	\$8,571,814	\$8,566,664	\$9,170,651	\$9,524,355
Change in NOO	\$7,707,531	\$7,338,309	\$6,624,534	\$8,163,331	\$7,308,132	\$9,665,558	\$7,707,531
NOO Beginning of Fiscal Year	\$66,858,603	\$59,520,294	\$52,895,760	\$44,732,429	\$37,424,297	\$27,758,739	\$66,858,603
NOO End of Fiscal Year	\$74,566,134	\$66,858,603	\$59,520,294	\$52,895,760	\$44,732,429	\$37,424,297	\$74,566,134

<sup>(1)</sup> Boxed area for Fiscal Years 2011 through 2014 are from Leominster's Financial Statements.

**SEWER DEPARTMENT: Calculation of Net OPEB Obligation**

"Funding" Schedule at 5.50%

Fiscal Year	UAAL	Normal Cost	Amort.	ARC	Interest on NOO	ARC Adjust.	OPEB Cost	Total Contribs. <sup>(2)</sup>	Change in NOO	NOO <sup>(3)</sup>
2009 <sup>(1)</sup>	\$825,389	\$51,684	\$30,483	\$82,166	\$0	\$0	\$82,166	\$14,584	\$67,583	\$67,583
2010 <sup>(1)</sup>	\$901,633	\$54,010	\$34,327	\$88,337	\$2,872	\$2,573	\$88,636	\$16,131	\$72,505	\$140,087
2011 <sup>(1)</sup>	\$1,130,623	\$58,198	\$45,852	\$104,050	\$5,954	\$5,511	\$104,493	\$19,534	\$84,960	\$225,047
2012 <sup>(1)</sup>	\$1,219,402	\$60,672	\$51,048	\$111,720	\$9,564	\$9,127	\$112,158	\$337,204	(\$225,047)	\$0
2013 <sup>(1)</sup>	\$298,790	\$34,989	\$16,066	\$51,055	\$0	\$0	\$51,055	\$767,117	(\$716,062)	(\$716,062)
2014 <sup>(1)</sup>	(\$460,038)	\$37,176	(\$25,404)	\$11,772	(\$44,754)	(\$39,542)	\$6,560	\$291,107	(\$284,547)	(\$1,000,609)
2015	(\$85,802)	\$52,352	(\$4,530)	\$47,822	(\$55,034)	(\$52,832)	\$45,620	\$212,104	(\$166,484)	(\$1,167,093)
2016	(\$288,496)	\$55,231	(\$15,739)	\$39,493	(\$64,190)	(\$63,670)	\$38,972	\$143,490	(\$104,518)	(\$1,271,611)
2017	(\$431,021)	\$58,269	(\$24,340)	\$33,929	(\$69,939)	(\$71,810)	\$35,800	\$152,630	(\$116,830)	(\$1,388,441)

<sup>1</sup> Figures for 2009-2014 (boxed area) from Leominster's Financial Reports.

<sup>2</sup> For all years, Total Contributions are equal to the attributed premiums paid including the implicit subsidy.

<sup>3</sup> NOO = Net OPEB Obligation

**SEWER DEPARTMENT: Calculation of Net OPEB Obligation (Alternative Presentation)**

	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014 <sup>(1)</sup>	Fiscal 2013 <sup>(1)</sup>	Fiscal 2012 <sup>(1)</sup>	Fiscal 2011 <sup>(1)</sup>
AAL	\$1,437,128	\$1,349,317	\$1,262,745	\$679,358	\$616,162	\$1,219,402	\$1,130,623
Assets	\$1,868,149	\$1,637,813	\$1,348,547	\$1,139,396	\$317,372	\$0	\$0
UAAL	(\$431,021)	(\$288,496)	(\$85,802)	(\$460,038)	\$298,790	\$1,219,402	NA
Service Cost	\$58,269	\$55,231	\$52,352	\$37,176	\$34,989	\$60,672	\$58,198
Amortization of UAAL	(\$24,340)	(\$15,739)	(\$4,530)	(\$25,404)	\$16,066	\$51,048	\$45,852
ARC	\$33,929	\$39,493	\$47,822	\$11,772	\$51,055	\$111,720	\$104,050
Interest on NOO (+)	(\$69,939)	(\$64,190)	(\$55,034)	(\$44,754)	\$0	\$9,564	\$5,954
ARC Adjustment (-)	(\$71,810)	(\$63,670)	(\$52,832)	(\$39,542)	\$0	\$9,127	\$5,511
OPEB Cost	\$35,800	\$38,972	\$45,620	\$6,560	\$51,055	\$112,158	\$104,493
Premiums and Implicit Subsidy Paid	\$52,630	\$43,490	\$37,104	\$16,107	\$12,117	\$20,564	\$19,534
Cash contributions	\$100,000	\$100,000	\$175,000	\$275,000	\$755,000	\$316,640	\$0
Total Contributions	\$152,630	\$143,490	\$212,104	\$291,107	\$767,117	\$337,204	\$19,534
Change in NOO	(\$116,830)	(\$104,518)	(\$166,484)	(\$284,547)	(\$716,062)	(\$225,047)	\$84,960
NOO Beginning of Fiscal Year	(\$1,271,611)	(\$1,167,093)	(\$1,000,609)	(\$716,062)	\$0	\$225,047	\$140,087
NOO End of Fiscal Year	(\$1,388,441)	(\$1,271,611)	(\$1,167,093)	(\$1,000,609)	(\$716,062)	\$0	\$225,047

<sup>(1)</sup> Boxed area for Fiscal Years 2011 through 2014 are from Leominster's Financial Statements.

**WATER DEPARTMENT: Calculation of Net OPEB Obligation**

"Funding" Schedule at 5.50%

Fiscal Year	UAAL	Normal Cost	Amort.	ARC	Interest on NOO	ARC Adjust.	OPEB Cost	Total Contribs. <sup>(2)</sup>	Change in NOO	NOO <sup>(3)</sup>
2009 <sup>(1)</sup>	\$2,384,409	\$95,092	\$88,059	\$183,151	\$0	\$0	\$183,151	\$50,700	\$132,451	\$132,451
2010 <sup>(1)</sup>	\$2,539,250	\$99,371	\$96,675	\$196,046	\$5,629	\$5,043	\$196,632	\$56,080	\$140,553	\$273,004
2011 <sup>(1)</sup>	\$3,266,177	\$107,078	\$132,458	\$239,536	\$11,603	\$10,739	\$240,399	\$67,908	\$172,491	\$445,495
2012 <sup>(1)</sup>	\$3,447,283	\$111,629	\$144,314	\$255,943	\$18,934	\$18,067	\$256,809	\$1,025,491	(\$768,682)	(\$323,187)
2013 <sup>(1)</sup>	\$1,298,577	\$54,405	\$69,824	\$124,229	(\$20,199)	(\$17,378)	\$121,408	\$416,075	(\$294,667)	(\$617,854)
2014 <sup>(1)</sup>	\$998,480	\$57,805	\$55,137	\$112,942	(\$38,616)	(\$34,118)	\$108,445	\$610,118	(\$501,673)	(\$1,119,527)
2015	\$679,136	\$60,636	\$35,858	\$96,494	(\$61,574)	(\$59,111)	\$94,031	\$885,250	(\$791,219)	(\$1,910,746)
2016	(\$201,463)	\$63,971	(\$10,991)	\$52,980	(\$105,091)	(\$104,239)	\$52,128	\$476,214	(\$424,086)	(\$2,334,832)
2017	(\$705,828)	\$67,489	(\$39,859)	\$27,630	(\$128,416)	(\$131,851)	\$31,066	\$480,673	(\$449,607)	(\$2,784,439)

<sup>1</sup> Figures for 2009-2014 (boxed area) from Leominster's Financial Reports.

<sup>2</sup> For all years, Total Contributions are equal to the attributed premiums paid including the implicit subsidy.

<sup>3</sup> NOO = Net OPEB Obligation

**WATER DEPARTMENT: Calculation of Net OPEB Obligation (Alternative Presentation)**

	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014 <sup>(1)</sup>	Fiscal 2013 <sup>(1)</sup>	Fiscal 2012 <sup>(1)</sup>	Fiscal 2011 <sup>(1)</sup>
AAL	\$2,620,503	\$2,542,798	\$2,456,937	\$2,354,841	\$2,254,152	\$3,447,283	\$3,266,177
Assets	\$3,326,331	\$2,744,261	\$1,777,801	\$1,356,361	\$955,575	\$0	\$0
UAAL	(\$705,828)	(\$201,463)	\$679,136	\$998,480	\$1,298,577	\$3,447,283	NA
Service Cost	\$67,489	\$63,971	\$60,636	\$57,805	\$54,405	\$111,629	\$107,078
Amortization of UAAL	(\$39,859)	(\$10,991)	\$35,858	\$55,137	\$69,824	\$144,314	\$132,458
ARC	\$27,630	\$52,980	\$96,494	\$112,942	\$124,229	\$255,943	\$239,536
Interest on NOO (+)	(\$128,416)	(\$105,091)	(\$61,574)	(\$38,616)	(\$20,199)	\$18,934	\$11,603
ARC Adjustment (-)	(\$131,851)	(\$104,239)	(\$59,111)	(\$34,118)	(\$17,378)	\$18,067	\$10,739
OPEB Cost	\$31,066	\$52,128	\$94,031	\$108,445	\$121,408	\$256,809	\$240,399
Premiums and Implicit Subsidy Paid	\$130,673	\$126,214	\$110,250	\$110,118	\$95,075	\$71,491	\$67,908
Cash contributions	\$350,000	\$350,000	\$775,000	\$500,000	\$321,000	\$954,000	\$0
Total Contributions	\$480,673	\$476,214	\$885,250	\$610,118	\$416,075	\$1,025,491	\$67,908
Change in NOO	(\$449,607)	(\$424,086)	(\$791,219)	(\$501,673)	(\$294,667)	(\$768,682)	\$172,491
NOO Beginning of Fiscal Year	(\$2,334,832)	(\$1,910,746)	(\$1,119,527)	(\$617,854)	(\$323,187)	\$445,495	\$273,004
NOO End of Fiscal Year	(\$2,784,439)	(\$2,334,832)	(\$1,910,746)	(\$1,119,527)	(\$617,854)	(\$323,187)	\$445,495

<sup>(1)</sup> Boxed area for Fiscal Years 2011 through 2014 are from Leominster's Financial Statements.

**CITY: Calculation of Net OPEB Obligation**

"Funding" Schedule at 4.75%

Fiscal Year	UAAL	Normal Cost	Amort.	ARC	Interest on NOO	ARC Adjust.	OPEB Cost	Total Contribs. <sup>(2)</sup>	Change in NOO	NOO <sup>(3)</sup>
2009 <sup>(1)</sup>	\$151,562,153	\$7,591,582	\$5,597,376	\$13,188,959	NA	NA	\$13,188,959	\$4,902,332	\$8,286,626	\$8,286,626
2010 <sup>(1)</sup>	\$160,904,035	\$7,933,204	\$5,799,263	\$13,732,467	\$373,398	\$315,490	\$13,790,374	\$5,422,496	\$8,367,878	\$16,654,505
2011 <sup>(1)</sup>	\$207,610,737	\$8,548,470	\$8,419,519	\$16,967,989	\$707,816	\$675,916	\$16,999,890	\$6,566,198	\$10,433,692	\$27,088,197
2012 <sup>(1)</sup>	\$218,641,695	\$9,297,853	\$9,153,013	\$18,450,866	\$1,151,248	\$1,134,873	\$18,467,242	\$7,807,955	\$10,659,287	\$37,747,484
2013 <sup>(1)</sup>	\$177,321,762	\$8,004,694	\$7,717,329	\$15,722,023	\$1,623,142	\$1,642,831	\$15,702,334	\$7,383,472	\$8,318,862	\$46,066,345
2014 <sup>(1)</sup>	\$185,716,729	\$8,348,896	\$8,365,398	\$16,714,294	\$1,980,853	\$2,075,006	\$16,620,141	\$7,670,589	\$8,949,552	\$55,015,897
2015	\$178,128,481	\$6,724,257	\$8,717,569	\$15,441,826	\$2,613,255	\$2,692,466	\$15,362,615	\$7,780,378	\$7,582,237	\$62,598,134
2016	\$185,440,724	\$7,043,659	\$9,405,787	\$16,449,446	\$2,973,411	\$3,175,056	\$16,247,801	\$8,380,889	\$7,866,912	\$70,465,046
2017	\$192,738,774	\$7,378,233	\$10,150,826	\$17,529,059	\$3,347,090	\$3,711,129	\$17,165,020	\$8,891,052	\$8,273,968	\$78,739,015

<sup>1</sup> Figures for 2009-2014 (boxed area) from Leominster's Financial Reports.

<sup>2</sup> For all years, Total Contributions are equal to the attributed premiums paid including the implicit subsidy.

<sup>3</sup> NOO = Net OPEB Obligation



**CITY: Calculation of Net OPEB Obligation (Alternative Presentation)**

	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014 <sup>(1)</sup>	Fiscal 2013 <sup>(1)</sup>	Fiscal 2012 <sup>(1)</sup>	Fiscal 2011 <sup>(1)</sup>
AAL	\$202,782,549	\$192,533,770	\$182,726,664	\$188,488,373	\$178,220,054	\$218,641,695	\$207,610,737
Assets	\$10,043,775	\$7,093,047	\$4,598,183	\$2,771,644	\$898,292	\$0	\$0
UAAL	\$192,738,774	\$185,440,724	\$178,128,481	\$185,716,729	\$177,321,762	\$218,641,695	NA
Service Cost	\$7,378,233	\$7,043,659	\$6,724,257	\$8,348,896	\$8,004,694	\$9,297,853	\$8,548,470
Amortization of UAAL	\$10,150,826	\$9,405,787	\$8,717,569	\$8,365,398	\$7,717,329	\$9,153,013	\$8,419,519
ARC	\$17,529,059	\$16,449,446	\$15,441,826	\$16,714,294	\$15,722,023	\$18,450,866	\$16,967,989
Interest on NOO (+)	\$3,347,090	\$2,973,411	\$2,613,255	\$1,980,853	\$1,623,142	\$1,151,248	\$707,816
ARC Adjustment (-)	\$3,711,129	\$3,175,056	\$2,692,466	\$2,075,006	\$1,642,831	\$1,134,873	\$675,916
OPEB Cost	\$17,165,020	\$16,247,801	\$15,362,615	\$16,620,141	\$15,702,334	\$18,467,242	\$16,999,890
Premiums and Implicit Subsidy Paid	\$6,641,052	\$6,130,889	\$5,780,378	\$5,770,589	\$5,624,388	\$6,912,705	\$6,566,198
Cash contributions	\$2,250,000	\$2,250,000	\$2,000,000	\$1,900,000	\$1,759,084	\$895,250	\$0
Total Contributions	\$8,891,052	\$8,380,889	\$7,780,378	\$7,670,589	\$7,383,472	\$7,807,955	\$6,566,198
Change in NOO	\$8,273,968	\$7,866,912	\$7,582,237	\$8,949,552	\$8,318,862	\$10,659,287	\$10,433,692
NOO Beginning of Fiscal Year	\$70,465,046	\$62,598,134	\$55,015,897	\$46,066,345	\$37,747,484	\$27,088,197	\$16,654,505
NOO End of Fiscal Year	\$78,739,015	\$70,465,046	\$62,598,134	\$55,015,897	\$46,066,345	\$37,747,484	\$27,088,197

<sup>(1)</sup> Boxed area for Fiscal Years 2011 through 2014 are from Leominster's Financial Statements.

## Implementation

According to the GASB Statement No. 45, its provisions are effective for Leominster fiscal years beginning after December 15, 2007. The timing is due to Leominster being a “Tier 2” government under GASB 34. In the first fiscal year of adoption, Fiscal 2009, Leominster recorded a liability of \$8,486,660 on its balance sheet. Leominster’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 2014, Leominster had recorded a figure of \$52,895,760 for its NOO.

This report provides similar information for FY 2015 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 Leominster 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 Leominster. Our understanding, based on information from the City of Leominster, is that the assets are in such a trust.

## 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 Leominster 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 City. We would recommend that the group review the following:

## 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. Leominster 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. The way Leominster invests its assets is also a factor in the selection of the appropriate discount rate. The City should understand the relationship between the two and adjust its investment policy if it sees the need. We recommend that the City review its funding policy each year.

## PLAN DESIGN

One of the major factors influencing costs is the design of the plans that Leominster 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 City 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 City should review the networks it is using to be sure that it is getting the most competitive reimbursement levels available.

## CONTRIBUTION LEVELS

The extent to which the City subsidizes the cost of retiree benefits is one of the most significant factors in the ultimate costs. Currently, retired Leominster City employees and their spouses pay 25% of the premium cost for their Commercial medical insurance depending upon the plan. This contribution level is in the middle of what we have seen among Massachusetts municipal entities. The lower end of employee contribution rates is in the 10%-15% range. 50% is the most that can be required. 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 borne by the City. 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. Leominster's participation level of 90% 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.

## ELIGIBILITY

The extent to which retirees are eligible for benefits is another variable that directly impacts costs. Leominster should review its eligibility criteria each year to be sure that they are in accord with City goals for controlling costs and for providing well-deserved benefits for those who have worked for the City. Retirement system policies can also affect the eligibility for benefits. In the case of Leominster, the City does pay for medical benefits for those who reach ten years of service even if such people do not retire from the City immediately upon separation from service. This will produce a higher liability and ARC for Leominster than if only those actually retiring from the City were covered.

In addition to reviewing the above items regularly, we recommend that the City 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:

- 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.

**SECTION II - ACTUARIAL VALUATION DETAILS**

**Population Data**

**A. DISTRIBUTION BY AGE: RETIREES, BENEFICIARIES, AND SURVIVORS**

(Includes retirees with life only or no coverage)

Age	Sewer	Water	Other	Total
0-19	0	0	0	0
20-24	0	0	0	0
25-29	0	0	0	0
30-34	0	0	3	3
35-39	0	0	6	6
40-44	0	0	7	7
45-49	0	0	12	12
50-54	0	0	23	23
55-59	0	2	44	46
60-64	2	1	133	136
65-69	2	2	348	352
70-74	2	0	170	172
75-79	0	2	129	131
80-84	0	10	123	133
85-89	0	2	79	81
90-94	0	4	49	53
95-99	0	0	10	10
100+	0	0	2	2
<b>TOTAL</b>	<b>6</b>	<b>23</b>	<b>1,138</b>	<b>1,167</b>

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

**B1. CITY: NOT WATER OR SEWER: FUTURE RETIREES – ACTIVE PARTICIPANTS**

# OF PARTICIPANTS\*

Current Plan	Mandatory Medicare Eligible	Pre-Mandatory Medicare Eligible	Total
No Medical/ Unknown	257	3	260
Indemnity	0	0	0
Managed Care	813	33	846
<b>TOTAL</b>	<b>1,070</b>	<b>36</b>	<b>1,106</b>

**B2. SEWER: FUTURE RETIREES – ACTIVE PARTICIPANTS**

# OF PARTICIPANTS\*

Current Plan	Mandatory Medicare Eligible	Pre-Mandatory Medicare Eligible	Total
No Medical/ Unknown	1	0	1
Indemnity	0	0	0
Managed Care	7	1	8
<b>TOTAL</b>	<b>8</b>	<b>1</b>	<b>9</b>

**B3. WATER: FUTURE RETIREES – ACTIVE PARTICIPANTS**

# OF PARTICIPANTS\*

Current Plan	Mandatory Medicare Eligible	Pre-Mandatory Medicare Eligible	Total
No Medical/ Unknown	0	0	0
Indemnity	0	0	0
Managed Care	11	5	16
<b>TOTAL</b>	<b>11</b>	<b>5</b>	<b>16</b>

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

■ City of Leominster  
 Other Post-Employment Benefits Valuation, January 1, 2015

PLAN DEFINITION TABLE<sup>(1)</sup>

Name of Plan	Type of Plan	Ind Rate	Retirees Enrolled	Fam Rate	Retirees Enrolled	EE Cont %
Blue Choice	Commercial Managed Care	\$854.00	34	\$2,200.00	11	25.00%
Network Blue	Commercial Managed Care	\$612.00	106	\$1,590.00	53	25.00%
Medicare HMO Blue	Medicare Managed Care	\$266.44	14	N/A	N/A	25.00%
Tufts Medicare Preferred	Medicare Managed Care	\$262.00	50	N/A	N/A	25.00%
Medex	Medicare Indemnity	\$331.00	605	N/A	N/A	25.00%
Dental Blue	Dental	\$35.92	314	\$87.60	299	50.00%
Life	Life	\$6.30	586	N/A	N/A	50.00%

(1) Rates at 1/1/2015

C1. WATER DEPARTMENT: 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	0	0	0	0	0	0	0	0	0	0
20-24	0	0	0	0	0	0	0	0	0	0
25-29	1	0	0	0	0	0	0	0	0	1
30-34	0	1	0	0	0	0	0	0	0	1
35-39	0	0	0	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0	0	0	0
45-49	1	0	0	1	0	0	0	0	0	2
50-54	1	0	1	0	0	2	0	0	0	4
55-59	1	0	0	1	0	1	1	0	0	4
60-64	0	0	0	0	0	1	1	2	0	4
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
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	4	1	1	2	0	4	2	2	0	16



C2. SEWER DEPARTMENT: 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	0	0	0	0	0	0	0	0	0	0
20-24	0	0	0	0	0	0	0	0	0	0
25-29	1	0	0	0	0	0	0	0	0	1
30-34	0	0	0	0	0	0	0	0	0	0
35-39	0	1	0	0	0	0	0	0	0	1
40-44	0	0	0	0	0	0	0	0	0	0
45-49	1	0	0	0	0	1	0	0	0	2
50-54	0	0	0	0	0	0	0	0	0	0
55-59	0	2	1	0	0	0	0	0	0	3
60-64	0	1	0	0	0	0	1	0	0	2
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
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	2	4	1	0	0	1	1	0	0	9

C3. CITY: 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	0	0	0	0	0	0	0	0	0	0
20-24	19	0	0	0	0	0	0	0	0	19
25-29	103	10	0	0	0	0	0	0	0	113
30-34	52	56	11	0	0	0	0	0	0	119
35-39	48	43	50	5	0	0	0	0	0	146
40-44	26	37	32	26	3	0	0	0	0	124
45-49	39	40	26	20	14	12	0	0	0	151
50-54	32	38	27	21	11	28	3	0	0	160
55-59	15	19	33	28	10	13	11	1	0	130
60-64	8	17	16	20	19	10	7	5	1	103
65-69	2	6	4	7	7	4	0	2	0	32
70-74	0	2	1	1	1	2	0	0	0	7
75-79	0	0	0	0	0	1	0	0	0	1
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	1	0	0	0	0	0	0	1
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
<b>TOTAL</b>	<b>344</b>	<b>268</b>	<b>201</b>	<b>128</b>	<b>65</b>	<b>70</b>	<b>21</b>	<b>8</b>	<b>1</b>	<b>1,106</b>

## Summary of Results

<b>Grand Total Actives</b>	
- Already in Medicare	0
- Pre-Mandatory Medicare Coverage	42
- Post-Mandatory Medicare Coverage	<u>1,089</u>
<b>Total</b>	<b>1,131</b>
<b>Retired, Disabled, Survivors and Beneficiaries</b>	<b>1,130</b>
<b>Terminated Vesteds</b>	<b>37</b>

At 4.75%/ 5.50% discount	
Active Employees	\$86,207,070
Current Retirees	<u>\$100,239,276</u>
<b>TOTAL</b>	<b>\$186,446,346</b>
Funding to date as of January 1, 2015	\$7,724,531
UAAL as of January 1, 2015	\$178,721,815
Normal (Service) Cost as of January 1, 2015	\$6,837,245
Twenty-four-yr amortization of UAAL	<u>\$8,748,897</u>
<b>TOTAL</b>	<b>\$15,586,142</b>

<b>Expected Claims</b>	
• Fiscal 2015	\$5,927,732

## Schedule of Funding Progress Other Post-Employment Benefits (Dollars in Thousands)

### GRAND TOTAL

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)
1/1/2009	\$0	\$154,772	\$154,772	0.00%	49,165	314.8%
1/1/2011	\$0	\$212,007	\$212,007	0.00%	\$58,941	359.7%
1/1/2013	\$2,171	\$181,090	\$178,919	1.20%	\$64,803	276.1%
1/1/2015	\$7,725	\$186,446	\$178,722	4.14%	\$64,323	277.9%

**Schedule of Funding Progress Other Post-Employment Benefits**  
(Dollars in Thousands)

CITY

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
1/1/2009	\$0	\$154,772	\$154,772	0.00%	\$49,165	314.8%
1/1/2011	\$0	\$212,007	\$212,007	0.00%	\$58,941	359.7%
1/1/2013	\$898	\$178,220	\$177,322	0.50%	\$63,644	278.6%
1/1/2015	\$4,598	\$182,727	\$178,128	2.52%	TBD	TBD

WATER

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
1/1/2009	\$0	\$2,384	\$2,384	0.00%	NA	NA
1/1/2011	\$0	\$3,266	\$3,266	0.00%	NA	NA
1/1/2013	\$956	\$2,254	\$1,299	42.4%	\$718	180.8%
1/1/2015	\$1,778	\$2,457	\$679	72.4%	TBD	TBD

SEWER

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
1/1/2009	\$0	\$825	\$825	0.00%	NA	NA
1/1/2011	\$0	\$1,131	\$1,131	0.00%	NA	NA
1/1/2013	\$317	\$616	\$299	51.5%	\$441	67.8%
1/1/2015	\$1,349	\$1,263	(\$86)	106.8%	TBD	TBD

**Funding Schedule**

30 Years for All Departments at 5.50%

Fiscal Year	Normal Cost <sup>1</sup>	Amortization <sup>2</sup>	Contribution	Year-End AAL	Projected Annual Benefit Cost <sup>3</sup>
2015	\$5,551,679	\$6,899,903	\$12,451,582	\$155,273,978	\$5,927,732
2016	\$5,857,021	\$7,124,150	\$12,981,171	\$156,298,069	\$6,300,593
2017	\$6,179,158	\$7,355,685	\$13,534,842	\$157,134,215	\$6,824,355
2018	\$6,519,011	\$7,594,744	\$14,113,756	\$157,764,141	\$7,165,827
2019	\$6,877,557	\$7,841,574	\$14,719,130	\$158,168,309	\$7,642,806
2020	\$7,255,822	\$8,096,425	\$15,352,247	\$158,325,838	\$7,987,577
2021	\$7,654,893	\$8,359,559	\$16,014,451	\$158,214,425	\$8,350,317
2022	\$8,075,912	\$8,631,244	\$16,707,156	\$157,810,255	\$8,725,691
2023	\$8,520,087	\$8,911,760	\$17,431,847	\$157,087,913	\$9,038,888
2024	\$8,988,692	\$9,201,392	\$18,190,084	\$156,020,280	\$9,358,567
2025	\$9,483,070	\$9,500,437	\$18,983,507	\$154,578,434	\$9,720,539
2026	\$10,004,639	\$9,809,201	\$19,813,840	\$152,731,540	\$10,040,248
2027	\$10,554,894	\$10,128,000	\$20,682,894	\$150,446,735	\$10,400,669
2028	\$11,135,413	\$10,457,160	\$21,592,573	\$147,689,001	\$10,674,224
2029	\$11,747,861	\$10,797,018	\$22,544,879	\$144,421,042	\$10,744,757
2030	\$12,393,993	\$11,147,921	\$23,541,914	\$140,603,142	\$10,810,657
2031	\$13,075,662	\$11,510,229	\$24,585,891	\$136,193,024	\$10,780,650
2032	\$13,794,824	\$11,884,311	\$25,679,135	\$131,145,692	\$11,003,619
2033	\$14,553,539	\$12,270,551	\$26,824,090	\$125,413,273	\$11,093,288
2034	\$15,353,984	\$12,669,344	\$28,023,328	\$118,944,845	\$11,325,864
2035	\$16,198,453	\$13,081,098	\$29,279,551	\$111,686,254	\$11,449,576
2036	\$17,089,368	\$13,506,233	\$30,595,601	\$103,579,921	\$11,503,887
2037	\$18,029,283	\$13,945,186	\$31,974,469	\$94,564,646	\$11,673,761
2038	\$19,020,894	\$14,398,405	\$33,419,298	\$84,575,385	\$11,793,001
2039	\$20,067,043	\$14,866,353	\$34,933,396	\$73,543,029	\$11,781,478
2040	\$21,170,730	\$15,349,509	\$36,520,239	\$61,394,163	\$11,781,609
2041	\$22,335,120	\$15,848,368	\$38,183,489	\$48,050,813	\$11,678,163
2042	\$23,563,552	\$16,363,440	\$39,926,992	\$33,430,179	\$11,580,776
2043	\$24,859,547	\$16,895,252	\$41,754,799	\$17,444,348	\$11,359,988
2044	\$26,226,822	\$17,444,348	\$43,671,170	\$0	\$11,084,859

<sup>1</sup>Assumes 5.5% annual increase in normal cost and a static group of actives

<sup>2</sup>Assumes 3.25% annual increase in amortization payment

<sup>3</sup>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.

## 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.

### 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 partially funded discount rate of 4.75% for the City and the fully funded rate of 5.50% for the Water and Sewer Departments.

Health Care Cost Trend Rates

	As Reported (4.75%/5.50%)	+1% Each Year	-1% Each Year
<b>Liability for:</b>			
▪ Future Retirees	\$86,207,070	\$107,424,960	\$70,209,517
▪ Current Retirees, Beneficiaries, and Survivors	\$100,239,276	\$112,811,578	\$89,696,082
<b>Total AAL</b>	\$186,446,346	\$220,236,538	\$159,905,599
Normal Cost	\$6,837,245	\$8,841,792	\$5,381,142
<b>Annual Required Contribution for Fiscal Year 2015:</b>	\$15,586,142	\$19,246,630	\$12,829,318

The cumulative effect of a 1% increase in health care cost trend increases the AAL by approximately 18%, the normal cost by 29%, and the ARC by 23%. A 1% decrease in trend would decrease the AAL by 14%, the normal cost by 21% and the ARC by 18%.

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.

#### 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 4.25%/5.00% and 5.25%/6.00% for the Water/Sewer Departments and City. The following table shows the results we obtained:

	Discount Rates		
	As Reported (4.75%/5.50%)	Minus 0.50% (4.25%/5.00%)	Plus 0.50% (5.25%/6.00%)
<b>Liability for:</b>			
▪ Future Retirees	\$86,207,070	\$95,595,107	\$78,306,009
▪ Current Retirees, Beneficiaries, and Survivors	\$100,239,276	\$105,789,119	\$95,030,922
<b>Total AAL</b>	\$186,446,346	\$201,384,226	\$173,336,931
Normal Cost	\$6,837,245	\$7,727,577	\$6,106,449
<b>Annual Required Contribution for Fiscal Year 2015:</b>	\$15,586,142	\$16,765,707	\$14,066,052

Thus, the cumulative effect of a 0.50% decrease in the discount rate is to increase the AAL by approximately 8%, the normal cost by 13%, and the ARC by 8%. A 0.50% increase in the discount rate would decrease the AAL by 7%, the normal cost by 11% and the ARC by 10%. It is prudent, and GASB Statement No. 45 requires, an updated actuarial valuation be performed periodically. For an entity of Leominster's size, a new valuation will be required at least every two years.

## Actuarial Methods and Assumptions

### ACTUARIAL METHODS

#### 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.

#### Interest Rate / Discount Rate

5.50% for Water and Sewer Departments (Fully funded and reflecting the investment allocation); 4.75% for the City itself (Partially funded and reflecting the investment allocation) per year net of investment expenses.

#### Amortization Method

Closed twenty-four year amortization (remainder of initial thirty-year amortization). Uses level percentage of payroll (using a 3.25% annual rate of increase).

#### Asset Valuation Method

Market value of assets.

### ACTUARIAL ASSUMPTIONS

#### Valuation Date

January 1, 2015

#### Mortality

- **Actives:** The RP-2000 Mortality Tables (Sex-distinct) for Employees projected using generational mortality and scale BB.
- **Retirees:** The RP-2000 Mortality Tables (Sex-distinct) for Healthy Annuitants projected using generational mortality and scale BB.
- **Disabled:** The RP-2000 Mortality Tables (Sex-distinct) for Healthy Annuitants projected using generational mortality and scale BB. Set forward 2 years

No additional mortality projection is assumed other than as described above.

#### Eligibility for Vested Post-Retirement Medical Benefits upon Withdrawal

10 years of Service; assumed that individuals who withdraw prior to age 40 will elect a return of pension contributions and therefore be ineligible for retiree medical coverage



**Actuarial Methods and Assumptions (Continued)**

Withdrawal Prior to Retirement, Non-Teachers

Based on years of service. Same for both pre and post-April 1, 2012 hires.

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)**

Withdrawal Prior to Retirement, Teachers

Same for both pre and post-April 1, 2012 hires.

		Service			
		Age	0	5	10
Male Teachers	25		12.00%	4.50%	1.00%
	35		11.00	5.00	1.50
	45		9.50	5.00	2.00
	55		7.50	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

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.

Rate of Disability			
Age	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)**

Rates of Retirement, Non-Teachers

Based on gender, group, and hire date.

Age	Hired Pre-April 2, 2012			Hired Post-April 1, 2012		
	Groups 1 and 2 Male	Groups 1 and 2 Female	Group 4	Groups 1 and 2 Male	Groups 1 and 2 Female	Group 4
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%	-	-	25.00%
56	2.50%	6.50%	10.00%	-	-	15.00%
57	2.50%	6.50%	10.00%	-	-	20.00%
58	5.00%	6.50%	10.00%	-	-	10.00%
59	6.50%	6.50%	15.00%	-	-	15.00%
60	12.00%	5.00%	20.00%	30.00%	30.00%	20.00%
61	20.00%	13.00%	20.00%	20.00%	10.00%	20.00%
62	30.00%	15.00%	25.00%	15.00%	12.00%	25.00%
63	25.00%	12.50%	25.00%	25.00%	10.00%	25.00%
64	22.00%	18.00%	30.00%	20.00%	15.00%	30.00%
65	40.00%	15.00%	100.00%	25.00%	13.00%	100.00%
66	25.00%	20.00%	NA	20.00%	18.00%	NA
67	25.00%	20.00%	NA	50.00%	40.00%	NA
68	30.00%	25.00%	NA	30.00%	25.00%	NA
69	30.00%	20.00%	NA	30.00%	25.00%	NA
70	100.00%	100.00%	NA	100.00%	100.00%	NA

**Actuarial Methods and Assumptions (Continued)**

Rates of Retirement, Teachers

Based on gender, years of service, and hire date.

Age	Hired Pre-April 2, 2102						Hired Post-April 1, 2012					
	<20 years service		20-29 years service		>29 years service		<20 years service		20-29 years service		>29 years service	
	M	F	M	F	M	F	M	F	M	F	M	F
50	N/A	N/A	1%	1.5%	2%	2%	N/A	N/A	N/A	N/A	N/A	N/A
51	N/A	N/A	1	1.5	2	2	N/A	N/A	N/A	N/A	N/A	N/A
52	N/A	N/A	1	1.5	2	2	N/A	N/A	N/A	N/A	N/A	N/A
53	N/A	N/A	1	1.5	2	2	N/A	N/A	N/A	N/A	N/A	N/A
54	N/A	N/A	1	1.5	2	2	N/A	N/A	N/A	N/A	N/A	N/A
55	3%	2%	3	3	6	6	3%	0%	0%	0%	0%	0%
56	8	2	5	3	20	15	8	0	0	0	0	0
57	15	8	8	7	35	30	15	0	0	0	0	0
58	15	10	10	7	50	35	15	0	0	0	0	0
59	20	15	20	11	50	35	20	0	0	0	0	0
60	15	20	20	16	50	35	25	25	35	23	45	45
61	30	20	25	20	50	35	35	30	35	30	45	45
62	20	25	30	30	40	40	30	25	30	25	45	45
63	30	24	30	30	40	30	35	25	30	25	45	45
64	40	20	30	30	40	35	40	30	35	30	45	45
65	40	30	40	30	50	35	40	30	35	30	45	45
66	40	30	30	30	50	35	40	30	40	30	45	45
67	40	30	30	30	50	30	50	35	45	35	55	45
68	40	30	30	30	50	30	50	35	45	35	55	45
69	40	30	30	30	50	30	55	35	45	35	55	45
70	100	100	100	100	100	100	100	100	100	100	100	100

**Actuarial Methods and Assumptions (Continued)**

Initial Claim Cost

Age	Managed Care Commercial Individual	Managed Care Commercial Blended <sup>(1)</sup>	Managed Care Medicare	Indemnity Medicare	Dental Individual	Dental Blended
55	\$7,687.38	\$14,794.33	\$1,563.58	\$2,126.26	\$431.39	\$767.23
60	\$9,174.38	\$17,656.08	\$1,866.03	\$2,537.55	\$449.37	\$799.20
65	\$11,269.78	\$17,521.11	\$2,292.23	\$3,117.12	\$468.10	\$832.51
70	\$13,064.77	\$20,311.77	\$2,657.32	\$3,613.59	\$476.82	\$848.03
75	\$14,781.58	\$22,980.90	\$3,006.52	\$4,088.45	\$485.71	\$863.83
80	\$16,320.06	\$25,372.77	\$3,319.44	\$4,513.98	\$487.50	\$867.03
85	\$17,152.55	\$17,152.55	\$3,488.76	\$4,744.24	\$487.50	\$867.03

<sup>(1)</sup> Blended rates below 65 are 50% Family and 50% Individual. Blended rates 65 and higher are 30% Family and 70% Individual. Dental Rates are 45% Family and 55% Individual. Individual rates are used for all participants 81 and higher.

Trend Rates by Plan

Year	Commercial Managed Care	Medicare Managed Care	Medicare Indemnity	Dental
2015	3.00%	8.00%	0.00%	0.00%
2016	8.00%	7.00%	8.00%	6.50%
2017	7.50%	6.50%	7.50%	6.00%
2018	7.00%	6.00%	7.00%	5.50%
2019	6.50%	5.50%	6.50%	5.00%
2020	6.00%	5.00%	6.00%	5.00%
2021	5.50%	5.00%	6.00%	5.00%
2022	5.00%	5.00%	6.00%	5.00%
2023	5.00%	5.00%	6.00%	5.00%
2024	5.00%	5.00%	6.00%	5.00%
2025	5.00%	5.00%	6.00%	5.00%
2026	5.00%	5.00%	6.00%	5.00%
2027	5.00%	5.00%	5.75%	5.00%
2028	5.00%	5.00%	5.75%	5.00%
2029	5.00%	5.00%	5.75%	5.00%
2030	5.00%	5.00%	5.75%	5.00%
2031	5.00%	5.00%	5.75%	5.00%
2032	5.00%	5.00%	5.50%	5.00%
2033	5.00%	5.00%	5.50%	5.00%
2034	5.00%	5.00%	5.50%	5.00%
2035	5.00%	5.00%	5.50%	5.00%
2036	5.00%	5.00%	5.50%	5.00%
2037	5.00%	5.00%	5.25%	5.00%
2038	5.00%	5.00%	5.25%	5.00%
2039	5.00%	5.00%	5.25%	5.00%
2040	5.00%	5.00%	5.25%	5.00%
2040	5.00%	5.00%	5.25%	5.00%
2041	5.00%	5.00%	5.00%	5.00%

## Actuarial Methods and Assumptions (Continued)

### Medicare Eligibility

- **Employees:** 100% if hired March 31, 1986 or after; 85% if hired pre-March 31, 1986
- **Spouses:** 100%

### Expenses

Administrative expenses are included in the per capita medical cost assumption.

### Participation Rates

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.

All Retirees: 90% of the active employees eligible for post-employment medical benefits are assumed to elect Medical Coverage immediately upon retirement.

60% of active employees eligible for post-employment medical benefits are assumed to elect Dental Insurance coverage immediately upon retirement.

90% of active employees eligible for post-employment medical benefits are assumed to elect Life Insurance coverage immediately upon retirement.

For all Retirees: For the City plans 60% of spouses are assumed to participate.

Participants with no or unknown current coverage (e.g. active employees who do not currently participate in Leominster'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.

### Plan Enrollment Rates

These are the rates at which retirees select medical plans, given that they enroll in a medical plan. The selection patterns follow the table on page 11.

### Projections

The January 1, 2015 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.

### 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.

### Principal Plan Provisions Recognized in Valuation

#### PPACA

This valuation does not include any potential impact from the Patient Protection and Affordable Care Act (PPACA) other than those already adopted as of the valuation date. This includes new plans or taxes including the so-called "Cadillac Tax" high-cost health plans.

#### ELIGIBILITY FOR BENEFITS

Current retirees, beneficiaries and spouses of Leominster are eligible for medical benefits, as are current employees or spouses who retire with a benefit from the Leominster. Survivors of Leominster employees and retirees are also eligible for medical benefits.

#### MEDICAL BENEFITS

Various medical plans offered by Leominster to its own employees.

#### LIFE INSURANCE

Leominster City retirees are eligible for a \$5,000 life insurance benefit offered by Leominster. Retirees pay 50% of the cost or \$3.15 per month for their coverage.

#### RETIREE CONTRIBUTIONS

Based on data provided by Leominster.

## 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.
- **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 Post-Employment 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.
- **Teachers:** Members of the Massachusetts State Teachers Retirement System are sometimes referred to as “teachers”.
- **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.