**Aon**
Retirement and Investment Consulting

# Commonwealth of Massachusetts

## Postemployment Benefit Other Than Pensions Actuarial Valuation

Fiscal Year Ending June 30, 2017

January 1, 2017 Valuation Date

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November 10, 2017

Thomas G. Shack III
Comptroller
The Commonwealth of Massachusetts
One Ashburton Place, Room 901
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This report presents the January 1, 2017 Actuarial Valuation results for the ***Commonwealth of Massachusetts ("the Commonwealth")*** for the retiree benefits (health and life insurance) that are provided through the Group Insurance Commission ("the GIC"). The purposes of this report are to:

(1) Determine the Commonwealth's January 1, 2017 obligations;

(2) Determine the Commonwealth's Fiscal Year End June 30, 2017 accrual under the *Governmental Accounting Standards Board (GASB)* standard based on GASB Statement 45;

(3) Provide disclosure information for the Fiscal Year End June 30, 2017; and

(4) Provide information that may be helpful in future planning for the Commonwealth.

A summary of the major results is shown in the Executive Summary, while the Principal Valuation Results Section provides more detail.

The Accounting Information Section summarizes GASB Other Postemployment Benefit (OPEB) accounting treatment including the Fiscal Year End June 30, 2017 Annual Required Contribution (ARC), Annual OPEB Cost (AOC), and Net OPEB Obligation (NOO).

This report's costs and liabilities are based upon the data and plan provisions provided by the Commonwealth, as summarized in the Demographic Information and Summary of Principal Plan Provisions Sections, respectively, and the funding method and actuarial assumptions outlined in the Methods and Assumptions Section of this report. This report presents our best estimate of the costs of the Plan in accordance with accepted actuarial principles and our understanding of GASB Statement 45.

Respectfully,

***Aon***

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# Executive Summary

The Commonwealth provides medical, prescription drug, mental health/substance abuse, and life insurance to retirees and their covered dependents. The Commonwealth pays a portion of the cost for retirees, spouses, and dependents. All active employees who retire from the Commonwealth and meet the eligibility criteria have the option to receive these benefits.

The Commonwealth also offers dental and vision care to retirees. Since these benefits are completely paid by the retirees, there is no GASB 45 liability for the Commonwealth.

This summary identifies the value of benefits as of January 1, 2017 and costs for the Fiscal Year End June 30, 2017. GASB requires that the most recent actuarial valuation be used in the determination of costs and liabilities. Therefore, this report provides Fiscal Year End June 30, 2017 costs and liabilities.

In 2006, the Office of the State Comptroller contracted with Aon to produce an actuarial valuation which calculated the liability of the present value of benefits if the Commonwealth chose to continue to fund that liability on a pay-as-you-go basis (using a discount rate of 4.50%) and what the liability would be should the Commonwealth choose to fully fund the liability over the next 30 years (using a discount rate of 7.50%).

With this information, the Commonwealth formed a Commission to study the issue. The Commission issued its report in July 2008 with a number of recommendations including a recommendation to dedicate a revenue stream toward partially funding the liability until the pension system is fully funded. While legislation was enacted by the Commonwealth to prefund this liability using an increasing share of tobacco master settlement revenues starting in FY 2013, this funding plan is still in its infancy and therefore the January 1, 2017 valuation has been run at the discount rate reflective of a low level of annual funding in relation to the Annual OPEB Cost (AOC). The Commonwealth developed a discount rate of 3.63%, based on the discount rate criteria found under GASB 74 which is applicable for the 2017 fiscal year.

# Executive Summary (continued)

The Commonwealth requested that Aon produce an updated liability with January 1, 2017 data for the Fiscal Year Ending June 30, 2017 at a discount rate of 3.63%, consistent with the discount rate assumed by the Commonwealth under GASB 74. The tables that follow show the results of these valuations:

| 2017 | |
|---|---|
| **Results in millions** | **3.63% Discount rate** |
| Liability | $20,263.5 |
| Assets | $817.4 |
| Unfunded Liability | $19,446.1 |

| 2016 | | |
|---|---|---|
| **Results in millions** | **4.50% Discount rate** | **7.50% Discount rate** |
| Liability | $17,082.9 | $10,915.3 |
| Assets | $760.4 | $760.4 |
| Unfunded Liability | $16,322.5 | $10,154.9 |

The liability computed for the program under GASB 45 increased from $17,082.9 million as of January 1, 2016 to $20,263.5 million as of January 1, 2017.

The main reasons for this increase were due to changes made to the discount rate and the actuarial methodology. These changes were made in order to better align the report with the requirements for GASB Statement 74 which is applicable for the first time in fiscal 2017. Together they added about 22% to the overall OPEB liability.

- The discount rate changed from 4.50% to 3.63%. This is based on the yield on high quality long term municipal bonds

- The actuarial method changed from the Projected Unit Credit method to the Entry Age Normal method.

Offsetting some of the increase in liability was favorable experience from the medical plan (per capita costs) and some changes in the medical plan provisions. These changes reduced the liability by about 10%

The overall liability change is developed as follows:

| | **Liability** |
|---|---|
| **2016 Valuation (in millions)** | $17,082.9 |
| Expected Increase | $892.9 |
| Demographic Changes | ($18.3) |
| Per Capita Adjustments | ($1,670.7) |
| Trend & Excise Assumption | ($86.4) |
| Mortality Assumption | $65.2 |
| Liability Method Change | $1,175.8 |
| Discount Rate Assumption | $2,822.1 |
| **2017 Valuation (in millions)** | $20,263.5 |

# Executive Summary (continued)

## Summary of Benefit Obligations

| GASB 45 Results for Fiscal Year End June 30, | 2017 * ($ millions) | 2016 ** ($ millions) |
|---|---|---|
| Present Value of all Projected Benefits | $27,492.3 | $23,888.7 |
| Present Value of Benefits | | |
| Earned to Date (Actuarial Accrued Liability) | $20,263.5 | $17,082.9 |
| FY Annual Required Contribution (ARC)*** | $1,623.2 | $1,417.8 |
| FY Annual OPEB Cost | $1,660.6 | $1,474.8 |
| Expected Benefit Payments | $521.0 | $536.6 |

*** The Fiscal Year End June 30, 2017 Present Value of Benefits was calculated on January 1, 2017 using a 3.63% discount rate.**

**** The Fiscal Year End June 30, 2016 Present Value of Benefits was calculated on January 1, 2016 using a 4.50% discount rate.**

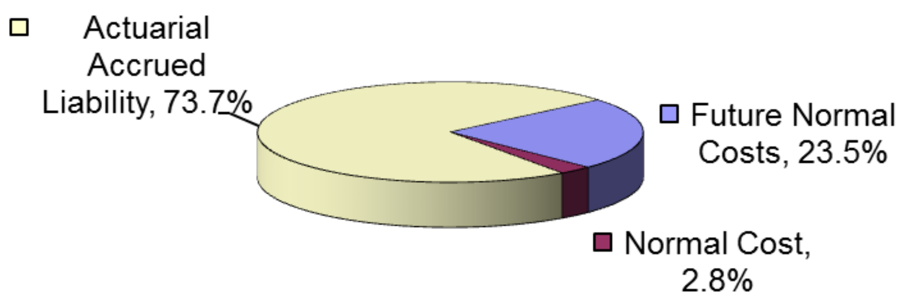
***** The Annual Required Contribution reflects a closed 30-year, 4.5% annual increasing amortization of the Unfunded Actuarial Accrued Liability.**

- The ***Present Value of all Projected Benefits*** is the total present value of all expected future benefits, based on certain actuarial assumptions. The Present Value of all projected benefits is a measure of total liability or obligation. Essentially, the Present Value of all projected benefits is the value (on the valuation date) of the benefits promised to current and future retirees. The Plan's present value of all projected benefits (at January 1, 2017) is $27,492.3 million. The majority of this liability is for current active employees (future retirees).
- The ***Actuarial Accrued Liability*** is the liability or obligation for benefits earned through the valuation date, based on certain actuarial methods and assumptions. The Plan's Actuarial Accrued Liability (at January 1, 2017) is $20,263.5 million assuming no prefunding of obligations. Approximately 52.6% of this obligation is for active employees. The Actuarial Accrued Liability represents approximately 73.7% of the present value of all projected benefits.
- The ***Expected Benefit Payments*** are calculated as of a fixed point in time, based on the actuarial method and assumptions used in this report and are not intended to match actual benefits paid by the Commonwealth. The actual amount paid by the Commonwealth during the 2017 Fiscal Year was $482.7 million. Differences between the Expected Benefit Payments and the amount the Commonwealth actually paid during the fiscal year are summarized below:
  - Historical claims used in the medical underwriting are trended forward to match the valuation date in question;
  - The valuation assumes new retirees based on the retirement timing assumptions set forth by the Massachusetts State Board of Retirement, and may not match actual experience for that period;
  - Underwriting adjustments are made to fully-insured plans' premiums to create estimated retiree-specific costs as well as to the cost for over-65 retirees who are not eligible for Medicare benefits and for the aging of the retiree population; and
  - Actuarial benefit payments are calculated as of the beginning of the year and trended forward (normalized) to the end of the valuation year with interest.

# Executive Summary (continued)

- ***Normal Cost*** is the value of benefits expected to be earned during the current year, again based on certain actuarial methods and assumptions. The Fiscal Year End June 30, 2017 Normal Cost is $779.8 million as of the beginning of the plan year. In pension accounting, this is also known as "**service cost**."
- ***Future Normal Costs*** represent the present value of the remaining balance of all projected benefits to be earned in future years.

The following chart illustrates (for the scenario assuming no prefunding) the Present Value of all Projected Benefits, the yellow area representing the Actuarial Accrued Liability in total:



# Executive Summary (continued)

The results were calculated based upon plan provisions, as provided by the Commonwealth, along with certain demographic and economic assumptions as recommended by Aon, in conjunction with the Commonwealth with guidance from the GASB statement.

## Demographic Assumptions

Data was provided by the Commonwealth as of January 1, 2017. Demographic assumptions used to project the data are the same as those used to value the Commonwealth's pension liabilities under GASB 68. There is no assumption for future new hires.

## Economic Assumptions

For FY17, governmental GAAP reporting is governed by two requirements that have different requirements for calculating discount rates. Under GASB Statement No. 74 (*Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*), which is effective for fiscal years beginning after June 15, 2016 (i.e., for FY17) OPEB *plans* are required to discount retiree health care liabilities, based on a blend of 30 year municipal bond rates and the expected return for assets in the trust, "blended", or weighted, by the funding level of the OPEB trust relative to OPEB liabilities. The rate of return for assets in the OPEB trust is assumed to be 7.50%, consistent with the rate used for the Commonwealth's pension trust, while the relevant municipal bond rate is 3.58%, resulting in a 3.63% blended discount rate, weighted towards the lower municipal bond rate due to the relatively low funding level of the OPEB trust in relation to the Commonwealth's OPEB liability. Under GASB Statement No. 45, which governs how OPEB liabilities are discounted in the Commonwealth's financial statements through FY17, the Commonwealth is required to discount retiree health care liabilities at the estimated long-term yield on investments that are that are expected to be used to finance the payment of benefits. Under an OPEB plan that is not pre-funded (as is the case with the Commonwealth), the discount rate would be based on the portfolio of the Commonwealth's "general assets" used to pay these benefits. Historical monthly yields for this portion of the portfolio are derived from the rate of return of the Massachusetts Municipal Depository Trust (MMDT) which is an investment pool managed by the Treasurer and Receiver – General. The requirements of GASB 45 and GASB 74 result in different discount rates, and while it is permissible under current GASB standards to use different discount rates to value the OPEB *plan* liabilities and report that liability in the Commonwealth's *financial statements*, in the interest of consistency and clarity the Commonwealth has chosen to use the same rate for both, based on the GASB 74 requirements, which in any case will be effective for financial statement reporting in FY18. Therefore, although this valuation meets the requirements of GASB statement 45, the discount rate has been calculated based on the new guidance to be consistent with the rate used under GASB 74 for the fiscal year ending June 30, 2017.

The Commonwealth has established a retiree benefits trust fund. In developing the 2009 budget, the Commonwealth funded OPEB initially with a transfer from the General Fund of $372 million, which was subsequently reduced to $352 million by legislative action reflecting actual cost of benefits for 2009. In fiscal 2008, the Commonwealth funded transfers from the General Fund including federally approved cost recovery on fringe benefits and a supplemental budget totaling approximately $355 million. Furthermore, the corpus of unspent master settlement agreement proceeds were also transferred amounting to approximately $329 million. The current asset value as of January 1, 2017, after adjusting for payments and investment return, is $817.4 million.

# Executive Summary (continued)

The trend assumption is used to project the growth of the expected claims over the lifetime of the health care recipients. The GASB statement does not require a particular source for information to determine health care trends, but it does recommend selecting a source that is "publicly available, objective and unbiased."

Aon developed the trend assumption utilizing the short-term health care spending growth rates expected on the Commonwealth plan along with information in published papers from other industry experts (actuaries, health economists, etc.). This annual growth rate initially is at 8.50% and decreases to a 5.0% long-term trend rate for all health care benefits after seven years. The health care cost trend assumption was revised for purposes of the January 1, 2017 valuation to be more representative of Aon's long-term expectations for the increases in health benefits.

The GIC began offering an Employee Group Waiver Plan (or EGWP, Medicare prescription drug coverage for OPEB plan participants) for most of their members effective January 1, 2016. The use of the EGWP approach lowered the actuarial present value of future plan benefits.

## Health Care Reform

Certain provisions of health care legislation that are effective in future years have the potential to impact the GASB 45 liabilities. As a result of the Affordable Care Act legislation, beginning in 2020 there will be a 40% excise tax on per capita medical benefit costs that exceed certain thresholds. We estimate that the excise tax results in a 1.09% and 3.44% increase to the Commonwealth of Massachusetts's Actuarial Accrued Liability and Normal Cost, respectively, associated with medical and prescription drug coverage as of January 1, 2017. This assumption has been revised based on recent claims experience and results in an actuarial gain when compared to the prior valuation report. Further detail of the excise tax calculation is included in the Methods and Assumptions section of this report.

The balance of this report provides greater detail for the above results.

# Actuarial Certification

This report presents the results of the Actuarial Valuation for the Commonwealth of Massachusetts' Postemployment Benefits Other Than Pensions (the Plan) as of January 1, 2017 for development of accounting and financial reporting information under Statement No. 45 of the Governmental Accounting Standards Board.

This report has been prepared using generally accepted actuarial practices and methods. The actuarial assumptions (other than those strictly applicable to valuing the Plan, or as otherwise explicitly specified) used in the calculations are consistent with those used by the Commonwealth's Actuary for the pension valuation for the State Retirement System. We have discussed Plan-specific assumptions with the Commonwealth and believe them to be reasonable.

Aon did not audit the employee data and financial information used in this valuation. On the basis of our review of this data, we believe that the information is sufficiently complete and reliable, and that it is appropriate for the purposes intended.

Actuarial computations under GASB 45 are for purposes of fulfilling governmental accounting requirements. The calculations reported herein have been made on a basis consistent with our understanding of the accounting standard. Determinations for purposes other than meeting governmental financial accounting requirements may be different from these results. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security at termination.

This report is intended for the sole use of the Commonwealth. It is intended only to supply information for the Commonwealth to comply with the stated purposes of the report and may not be appropriate for other purposes. Reliance on information contained in this report by anyone for other than the intended purposes, puts the relying entity at risk of being misled because of confusion or failure to understand applicable assumptions, methodologies, or limitations of the report's conclusions. Accordingly, no person or entity, including the Commonwealth should base any representations or warranties in any business agreement on any statements or conclusions contained in this report without the written consent of Aon.

The actuaries whose signatures appear below are Members of the American Academy of Actuaries and together meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. They are available to answer any questions with regard to the matters enumerated in this report.

We further certify that this report is in compliance with Actuarial Standard of Practice No. 41, "Actuarial Communications."

Aon's relationship with the Plan and the Commonwealth is strictly professional. There are no aspects of the relationship that may impair or appear to impair the objectivity of our work.

Thomas G. Vicente

Elizabeth A. Hanson

Thomas G. Vicente, FSA, MAAA

Elizabeth A. Hanson, FSA, MAAA

# Principal Valuation Results

The following highlights the Commonwealth's recognition of its GASB 45 obligations:

- The January 1, 2017 assets are $817.4 million.
- The FYE June 30, 2017 Annual Required Contribution (ARC) is $1,623.2 million.
- The FYE June 30, 2017 Annual OPEB Cost (AOC) is $1,660.6 million.
- Expected Fiscal Year Ending June 30, 2017 benefit payments are $521.0 million.

The following table shows results by active, inactive and retired employee groups as compared to what was reported as of January 1, 2016:

| GASB Results ($ millions) | January 1, 2017 | | | January 1, 2016 |
|---|---|---|---|---|
| | (1) Health | (2) Life Insurance | Total = (1) + (2) | Total |
| **Present Value of Projected Benefits** | | | | |
| Active | $17,793.5 | $87.4 | $17,880.9 | $15,025.3 |
| Inactive[1] | $743.0 | $3.4 | $746.4 | $663.4 |
| Retirees | $8,709.1 | $155.9 | $8,865.0 | $8,200.0 |
| Total | $27,245.6 | $246.7 | $27,492.3 | $23,888.7 |
| **Actuarial Accrued Liability** | | | | |
| Active | $10,588.4 | $63.7 | $10,652.1 | $8,219.5 |
| Inactive [1] | $743.0 | $3.4 | $746.4 | $663.4 |
| Retirees | $8,709.1 | $155.9 | $8,865.0 | $8,200.0 |
| Total | $20,040.5 | $223.0 | $20,263.5 | $17,082.9 |
| **Assets** | $808.4 | $9.0 | $817.4 | $760.4 |
| **Unfunded Actuarial Accrued Liability** | $19,232.1 | $214.0 | $19,446.1 | $16,322.5 |
| **Normal Cost at beginning of year** | $776.7 | $3.1 | $779.8 | $632.3 |

[1] Inactives are certain former employees with at least the minimum required years of creditable service who have left contributions in the state retirement system.

2017 figures are based on a 3.63% discount rate.

2016 figures are based on a 4.50% discount rate.

# Trust Information

An OPEB Trust was established effective June 30, 2008 by an appropriations bill. Trust assets for former MTA employees were merged with all the other SRBTF assets in February 2015. The transfer is included as a contribution below. The activity of this trust from January 1, 2016 through January 1, 2017 is as follows:

| **Market Value of Assets** | | | | |
|---|---|---|---|---|
| **January 1, 2016 ($ millions)** | | | | $760.4 |
| (1) | Contributions | | | $0.1 |
| (2) | Investment Change | | | |
| | | (a) | Gross Investment Income | $22.7 |
| | | (b) | Less Management Fees | ($4.5) |
| | | (c) | Net Investment Income = (2a) + (2b) | $18.2 |
| | | (d) | Net Unrealized Gains / Losses | $17.2 |
| | | (e) | Net Realized Gains / Losses | $22.0 |
| | | (f) | Total = (2c) + (2d) + (2e) | $57.4 |
| (3) | Disbursements | | | |
| | | (a) | Benefit Payments | ($0.5) |
| (4) | Net Change = (1) + (2f) + (3a) | | | $57.0 |
| **January 1, 2017 ($ millions)** | | | | **$817.4** |

# Accounting Information

The following shows the Annual Required Contribution (ARC), Annual OPEB Cost (AOC), and projected June 30, 2017 Net OPEB Obligation (NOO).

## Annual Required Contribution (ARC)

The Standard sets the method for determining the Commonwealth's postemployment benefits accrual, the Annual Required Contribution (ARC), to include both the value of benefits earned during the year (Normal Cost) and an amortization of the Unfunded Actuarial Accrued Liability. Accordingly, the following table shows the Commonwealth's Fiscal Year End June 30, 2017 Annual Required Contribution (ARC) based on a closed 30-year amortization of the Unfunded Actuarial Accrued Liability as an increasing 4.5% annual amortization compared to what was reported for Fiscal Year End June 30, 2016.

| Fiscal Year Ending June 30, | 2017 ($ millions) | 2016 ($ millions) |
|---|---|---|
| Normal Cost at End of Year | $808.1 | $660.7 |
| Unfunded Actuarial Accrued Liability Amortization | $815.1 | $757.1 |
| Annual Required Contribution (ARC) | $1,623.2 | $1,417.8 |

# Accounting Information (continued)

## Schedule of Amortization Bases

For each year the Annual Required Contribution (ARC) is calculated, a new amortization base is established. The sum of all amortization bases is shown on the prior page as the Unfunded Actuarial Accrued Liability Amortization. The chart below illustrates the development of the total amortization calculation, when each base was established, the original amount of the base, and the payment associated with each for the current fiscal year.

| Original Amount ($ millions) | Year Established ($ millions) | Years Left | Unamortized Amount ($ millions) | BOY Annual Payment ($ millions) |
|---|---|---|---|---|
| $9,812.2 | 1/1/2008 | 21 | $10,291.7 | $450.2 |
| $5,037.9 | 1/1/2009 | 22 | $5,253.8 | $218.4 |
| ($315.9) | 1/1/2010 | 23 | ($329.6) | ($13.1) |
| $1,241.7 | 1/1/2011 | 24 | $1,293.6 | $48.9 |
| ($32.3) | 1/1/2012 | 25 | ($33.6) | ($1.2) |
| ($1,011.7) | 1/1/2013 | 26 | ($1,045.6) | ($36.2) |
| ($273.5) | 1/1/2014 | 27 | ($280.9) | ($9.3) |
| $707.8 | 1/1/2015 | 28 | $721.4 | $23.0 |
| $424.8 | 1/1/2016 | 29 | $429.1 | $13.1 |
| $3,146.2 | 1/1/2017 | 30 | $3,146.2 | $92.7 |
| Total | | | **$19,446.1** | **$786.5** |

| Calculation of 2017 Amortization Base | |
|---|---|
| Prior Contribution Deficiency | $861.0 |
| Prior AOC Adjustment | ($57.0) |
| Asset (Gain) / Loss | $54.5 |
| Demographic (Gain) / Loss | ($18.3) |
| Per Capita (Gain) / Loss | ($1,670.7) |
| Trend & Excise (Gain) / Loss | ($86.4) |
| Mortality (Gain) / Loss | $65.2 |
| Liability Method Change (Gain) / Loss | $1,175.8 |
| Discount Rate (Gain) / Loss | $2,822.1 |
| Expected vs. Actual Experience<br>- Benefit Payments & Contributions | $0.0 |
| Total | **$3,146.2** |

# Accounting Information (continued)

## Determination of Actuarial (Gain) / Loss

The following chart illustrates the development of the Actuarial Liability from January 1, 2016 through January 1, 2017.

| | | | **Total ($ Millions)** |
|---|---|---|---|
| (1) | Liability at 1/1/2016 | | $17,082.9 |
| | | | |
| (2a) | Service Cost | $660.7 | |
| (2b) | Interest Cost | $768.7 | |
| (2c) | Expected Benefit Payments | ($536.5) | |
| (2d) | Total Increase | $892.9 | |
| | | | |
| (3) | Expected Liability at 12/31/2016: (1) + (2d) | | $17,975.8 |
| | | | |
| (4a) | Demographic (Gain) / Loss | ($18.3) | |
| (4b) | Per Capita (Gain) / Loss | ($1,670.7) | |
| (4c) | Trend & Excise (Gain) / Loss | ($86.4) | |
| (4d) | Mortality (Gain) / Loss | $65.2 | |
| (4e) | Liability Method (Gain) / Loss | $1,175.8 | |
| (4f) | Discount Rate (Gain) / Loss | $2,822.1 | |
| (4g) | Total (Gain) / Loss | $2,287.7 | |
| | | | |
| (5) | Actual Liability at 1/1/2017: (3) + (4g) | | **$20,263.5** |

# Accounting Information (continued)

## Summary of Total Annual OPEB Cost (AOC)

The initial Net OPEB Obligation at July 1, 2007 was $0. Therefore, in Fiscal Year Ending June 30, 2008, or the first year of implementation of GASB 45, there is no adjustment to the Annual Required Contribution (ARC). As the years go forth, any cumulative unpaid ARC will result in an adjustment to the ARC.

| Fiscal Year Ending June 30, | 2017 ($ millions) | 2016 ($ millions) |
|---|---|---|
| Annual Required Contribution (ARC) | $1,623.2 | $1,417.8 |
| Adjustment to Annual Required Contribution | | |
| - Interest on Net OPEB Obligation (NOO) | $234.8 | $252.3 |
| - Amortization of Net OPEB Obligation (NOO) | ($197.4) | ($195.3) |
| Total Annual OPEB Cost (AOC) | $1,660.6 | $1,474.8 |

## Annual OPEB Cost Summary:

| Fiscal Year Ending | Annual OPEB Cost ($ millions) | Percentage of Annual OPEB Cost Contributed * | Net OPEB Obligation ($ millions) |
|---|---|---|---|
| 6/30/2015 | $1,410.0 | 45.2% | $5,605.6 |
| 6/30/2016 | $1,474.8 | 41.6% | $6,466.5 |
| 6/30/2017 | $1,660.6 | 32.9% | $7,581.1 |

* Based on expected benefit payments & contributions for the applicable fiscal year end. Contributions include both tobacco settlement revenues and capital gains tax revenues.

# Accounting Information (continued)

## Projected June 30, 2017 Net OPEB Obligation (NOO)

Based on the Annual OPEB Cost developed above, the following is the projected June 30, 2017 Net OPEB Obligation (NOO):

| | **Total ($ millions)** |
|---|---|
| July 1, 2015 Net OPEB Obligation (NOO) | $5,605.6 |
| *Plus: FYE 2016 Annual OPEB Cost (AOC)* | $1,474.8 |
| *Less: FYE 2016 Contributions ** | $613.9 |
| Equals: Actual June 30, 2016 Net OPEB Obligation (NOO) | $6,466.5 |
| *Plus: FYE 2017 Annual OPEB Cost (AOC)* | $1,660.6 |
| *Less:* Schedule of contributions from the employer and other contributing entities * | $546.0 |
| Equals: Expected June 30, 2017 Net OPEB Obligation (NOO) | $7,581.1 |

* Contributions include tobacco settlement revenues

## Required Supplementary Information

Below is the schedule of funding progress:

| **Valuation Date** | **Actuarial Value of Assets at Valuation Date ($ millions) (a)** | **Actuarial Accrued Liability - Projected Unit Credit ($ millions) (b)** | **Unfunded Actuarial Accrued Liability ($ millions) (b) - (a)** | **Funded Ratio (a) / (b)** | **Covered Payroll ($ millions) (c)** | **Unfunded Actuarial Accrued Liability as a Percentage of Covered Payroll [(b) - (a)] / (c)** |
|---|---|---|---|---|---|---|
| 1/1/2015 | $610.0 | $16,502.8 | $15,892.8 | 4% | $5,591.9 | 284.2% |
| 1/1/2016 | $760.4 | $17,082.9 | $16,322.5 | 4% | $5,792.3 | 281.8% |
| 1/1/2017 | $817.4 | $20,263.5 | $19,446.1 | 4% | $5,927.0 | 328.1% |

# 10-Year Payout Projection

Annual payments expected based on assumptions and contributions detailed in the Methods and Assumptions Section.

## Total Benefit Payments

| Fiscal Year Ending | Health ($ millions) | Life Insurance ($ millions) | Total ($ millions) |
|---|---|---|---|
| 6/30/2017 | $511.8 | $9.2 | $521.0 |
| 6/30/2018 | $560.0 | $9.3 | $569.3 |
| 6/30/2019 | $609.6 | $9.4 | $619.0 |
| 6/30/2020 | $659.8 | $9.6 | $669.4 |
| 6/30/2021 | $710.4 | $9.7 | $720.1 |
| 6/30/2022 | $757.8 | $9.8 | $767.6 |
| 6/30/2023 | $805.5 | $10.0 | $815.5 |
| 6/30/2024 | $850.9 | $10.2 | $861.1 |
| 6/30/2025 | $893.4 | $10.3 | $903.7 |
| 6/30/2026 | $936.3 | $10.5 | $946.8 |

## Estimated Tobacco Settlement Contributions

| Fiscal Year Ending | Tobacco Settlement ($ millions) |
|---|---|
| 6/30/2017 | $25.0 |
| 6/30/2018 | $25.0 |
| 6/30/2019 | $25.0 |
| 6/30/2020 | $25.0 |
| 6/30/2021 | $25.0 |
| 6/30/2022 | $25.0 |
| 6/30/2023 | $25.0 |
| 6/30/2024 | $25.0 |
| 6/30/2025 | $25.0 |
| 6/30/2026 | $25.0 |

# 10-Year Projection of Annual OPEB Cost (AOC)

Projections assume a closed group population (i.e., no new hires). We also assume that assets grow at a 7.50% annual rate of investment return.

| Fiscal Year Ending | ARC ($ millions) | Adjustment to ARC* ($ millions) | Total AOC ($ millions) | Expected Contributions** ($ millions) | Net OPEB Obligation at FYE ($ millions) |
|---|---|---|---|---|---|
| 6/30/2017 | $1,623.2 | $37.4 | $1,660.6 | $546.0 | $7,581.1 |
| 6/30/2018 | $1,732.2 | $43.8 | $1,776.0 | $594.3 | $8,762.8 |
| 6/30/2019 | $1,850.5 | $50.7 | $1,901.2 | $644.0 | $10,020.0 |
| 6/30/2020 | $1,976.5 | $57.9 | $2,034.4 | $694.4 | $11,360.0 |
| 6/30/2021 | $2,111.1 | $65.7 | $2,176.8 | $745.1 | $12,791.7 |
| 6/30/2022 | $2,254.7 | $73.9 | $2,328.6 | $792.6 | $14,327.7 |
| 6/30/2023 | $2,408.2 | $82.8 | $2,491.0 | $840.5 | $15,978.2 |
| 6/30/2024 | $2,572.3 | $92.4 | $2,664.7 | $886.1 | $17,756.8 |
| 6/30/2025 | $2,748.0 | $102.6 | $2,850.6 | $928.7 | $19,678.7 |
| 6/30/2026 | $2,936.3 | $113.7 | $3,050.0 | $971.8 | $21,756.9 |

* Including interest on Net OPEB Obligation.

** Based on expected benefit payments & contributions for the applicable fiscal year end. Contributions include both tobacco settlement revenue and capital gains tax revenue. Under the FY17 enacted budget, 10% of tobacco settlement revenue in fiscal year 2017 was dedicated to the State Retiree Benefits Trust Fund (SRBTF), the trust established to fund post-employment benefits. Under current law, this allocation is scheduled to increase until in fiscal year 2022 and thereafter all tobacco settlement revenue will be deposited in the SRBTF. However, this requirement has been suspended or modified as part of annual budgets, so the contribution to the trust is assumed to remain at $25 million annually going forward. In addition, 5% of fiscal year capital gains tax revenue in excess of $1 billion (adjusted annually for economic growth) is required by statute to be deposited in the SRBTF. This requirement was suspended by the legislature for fiscal years 2015 and 2016. Due to the volatility of capital gains tax revenue, additional contributions from this source are not assumed in future years.

The GASB has issued a new accounting standard (GASB Statement No. 74) for valuing OPEB benefits and discounting OPEB liabilities for fiscal years beginning after June 15, 2017. The above table uses the GASB 74 standard to value benefits and discount liabilities, but the table itself (which includes the ARC, which is not required by GASB 74) calculates the amount to be included in governments' balance sheet, or statement of net position, is based on the current GASB 45 standard only.

# Sensitivity Analysis

## Impact of 1% Change in Health Trend Rates

| | 3.63% Discount Rate ($ millions) | Impact of 1% Health Trend Rate Plus 1% trend ($ millions) | Minus 1% trend ($ millions) |
|---|---|---|---|
| **Funded Status:** | | | |
| Actuarial Accrued Liability | $20,263.5 | $24,762.9 | $16,875.6 |
| Assets | $817.4 | $817.4 | $817.4 |
| Unfunded Actuarial Accrued Liability | $19,446.1 | $23,945.5 | $16,058.2 |
| **Annual Required Contribution (ARC):** | | | |
| Normal Cost at End of Year | $808.1 | $1,102.8 | $605.6 |
| Unfunded Accrued Liability Amortization | $815.1 | $1,008.2 | $767.5 |
| Annual Required Contribution (ARC) | $1,623.2 | $2,111.0 | $1,373.1 |

# Demographic Information

The following tables summarize active, inactive participant, and retiree demographic information as of January 1, 2017.

| | Participants | Spouses | 1/1/2017 Total | 1/1/2016 Total |
|---|---|---|---|---|
| **Actives** | 71,465 | N/A | 71,465 | 71,623 |
| **Inactive participants**[1] | 2,671 | N/A | 2,671 | 2,664 |
| **Retirees** | 49,839 | 23,853 | 73,692 | 72,618 |
| **Survivors** | N/A | 7,419 | 7,419 | 7,779 |
| | **123,975** | **31,272** | **155,247** | **154,684** |

[1] Inactives are certain former employees with a minimum amount of years of creditable service who have left contributions in the State Retirement System.

| Actives: Counts by Job Group | | | | | |
|---|---|---|---|---|---|
| **Sex** | **1** | **2** | **3** | **4** | **Total** |
| Female | 34,103 | 1,473 | 79 | 1,118 | 36,773 |
| Male | 24,895 | 2,134 | 1,415 | 6,248 | 34,692 |
| **Total** | **58,998** | **3,607** | **1,494** | **7,366** | **71,465** |

| Actives: Average Age by Job Group | | | | | |
|---|---|---|---|---|---|
| **Sex** | **1** | **2** | **3** | **4** | **Total** |
| Female | 48.28 | 47.65 | 47.76 | 39.72 | 47.99 |
| Male | 48.73 | 46.84 | 47.17 | 41.83 | 47.31 |
| **Total** | **48.47** | **47.17** | **47.20** | **41.51** | **47.66** |

| Actives: Average Service by Job Group | | | | | |
|---|---|---|---|---|---|
| **Sex** | **1** | **2** | **3** | **4** | **Total** |
| Female | 13.11 | 15.24 | 21.45 | 10.27 | 13.13 |
| Male | 13.23 | 14.77 | 19.96 | 13.09 | 13.57 |
| **Total** | **13.16** | **14.96** | **20.04** | **12.66** | **13.34** |

# Demographic Information (continued)

**Active: Age-Service Scatter**

| | Service | | | | | | |
|---|---|---|---|---|---|---|---|
| **Age** | **0: 4** | **5: 9** | **10:14** | **15:19** | **20:24** | **25+** | **Total** |
| 15:19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:24 | 572 | 1 | 0 | 0 | 0 | 0 | 573 |
| 25:29 | 4,880 | 695 | 15 | 0 | 0 | 0 | 5,590 |
| 30:34 | 4,493 | 2,373 | 759 | 10 | 1 | 0 | 7,636 |
| 35:39 | 2,922 | 1,835 | 1,904 | 555 | 6 | 0 | 7,222 |
| 40:44 | 1,934 | 1,544 | 1,699 | 1,872 | 431 | 26 | 7,506 |
| 45:49 | 1,888 | 1,483 | 1,832 | 2,201 | 1,520 | 918 | 9,842 |
| 50:54 | 1,669 | 1,355 | 1,536 | 1,931 | 1,387 | 2,935 | 10,813 |
| 55:59 | 1,394 | 1,217 | 1,469 | 1,646 | 1,127 | 3,859 | 10,712 |
| 60:64 | 831 | 890 | 1,084 | 1,344 | 871 | 2,526 | 7,546 |
| 65:69 | 203 | 397 | 492 | 535 | 355 | 969 | 2,951 |
| 70+ | 27 | 90 | 123 | 188 | 111 | 535 | 1,074 |
| **Total** | **20,813** | **11,880** | **10,913** | **10,282** | **5,809** | **11,768** | **71,465** |

# Demographic Information (continued)

| Inactives and Retirees: Participant Counts | | | |
|---|---|---|---|
| **Sex** | **Inactives** | **Retirees** | **Total** |
| Female | 1,548 | 24,264 | 25,812 |
| Male | 1,123 | 25,575 | 26,698 |
| **Total** | **2,671** | **49,839** | **52,510** |

| Inactives and Retirees: Participant Average Age | | | |
|---|---|---|---|
| **Sex** | **Inactives** | **Retirees** | **Total** |
| Female | 51.82 | 72.45 | 71.21 |
| Male | 51.81 | 70.56 | 69.77 |
| **Total** | **51.82** | **71.48** | **70.48** |

| Spouses: Participant Counts | | | |
|---|---|---|---|
| **Sex** | **Spouses of Retirees** | **Survivors** | **Total** |
| Female | 8,187 | 6,547 | 14,734 |
| Male | 15,666 | 872 | 16,538 |
| **Total** | **23,853** | **7,419** | **31,272** |

| Spouses: Participant Average Age | | | |
|---|---|---|---|
| **Sex** | **Spouses of Retirees** | **Survivors** | **Total** |
| Female | 74.27 | 79.41 | 76.55 |
| Male | 68.48 | 77.51 | 68.95 |
| **Total** | **70.47** | **79.19** | **72.53** |

# Summary of Principal Plan Provisions

## Participation

Participation in the health and life insurance programs administered by the GIC is voluntary, but requires membership in the State Retirement System. Participation in the State Retirement System is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the retirement board, and approved by PERAC. Membership is optional for certain elected officials.

Differences in participation between the State Retirement System and the GIC are:

- Certain employees and retirees, who are eligible for GIC benefits, are covered by separate retirement boards and thus do not participate in the State Retirement System.
- Certain authorities, and other entities, participate in the State Retirement System, but are billed in full for their GIC benefits.

There are 4 classes of membership in the State Retirement System:

**Group 1:**

General employees, including clerical, administrative, technical and all other employees not otherwise classified.

**Group 2:**

Certain specified hazardous duty positions.

**Group 3:**

State police officers and inspectors.

**Group 4:**

Corrections officers, and other specified hazardous positions.

# Summary of Principal Plan Provisions (continued)

## Retirement Age Constraints

In 2 of the 4 groups (Groups 2 and 4) there is a small subset of positions that have a mandatory retirement age of age 65. There is no subset with a mandatory retirement age for employees in Groups 1 and 3. The actuarial assumptions used for this valuation were developed taking into account the small portion of the population subject to mandatory retirement provisions.

## Superannuation Retirement

Eligibility

A member is eligible for superannuation retirement (service retirement) upon meeting the following conditions:

- Completion of 20 years of service, or
- Attainment of age 55 if hired prior to 1978, or if classified in Group 3 or Group 4, or
- Attainment of age 55 with 10 years of service, if hired after 1978, and if classified in Group 1 or 2

Health and Basic Life Insurance Benefits

Retirees can achieve Medicare status by virtue of achieving age 65 with 40 quarters of Social Security service, by being approved for a disability, or being in a disease state that qualifies one for Medicare. The GIC provides health coverage to a small subset of retired employees who are age 65 or older who are not Medicare eligible because the Commonwealth's retirement pension system does not participate in the Social Security Administration's pension system. The retired employees are enrolled in the same health plans available to active employees under age 65. However, these employees may be covered by Medicare through a spouse's eligibility.

Both Medicare and Non-Medicare retirees, who retired on or before July 1, 1994, contribute 10% of the cost of the plan, as determined by the GIC. Those who retired after July 1, 1994 but on or before October 1, 2009 contribute 15% of the cost of the plan as determined by the GIC. Those who retired after October 1, 2009 contribute 20% of the cost of the plan as determined by the GIC. Certain supplemental benefits are fully paid for by the participant.

Upon the retirees' death, all survivors, regardless of their deceased spouse's retirement date, contribute 10% of the cost of their health coverage. Survivor health coverage continues until the survivor remarries or dies. Survivors are not eligible for life insurance benefits.

# Summary of Principal Plan Provisions (continued)

For Non-Medicare retirees, the total cost of the plan, for each option, is a blend of active and retiree claims and non-claims costs. Retiree contributions to these plans, at 10%, 15% or 20% of plan cost, depending on the date of retirement, are favorably influenced by this blending. The blending of active and retired experience results in an implicit rate subsidy, and results in these retirees paying less than 10%, 15% or 20% of their cohort's expected cost. As shown below, Aon has valued the age appropriate claims costs, and the dollar amount of retiree contributions, to effectively capture the resulting costs and liabilities to the Commonwealth.

## Termination With 10 or More Years of Service (Contingent Status)

Eligibility

A participant who has completed 10 or more years of creditable service may be eligible for benefits on a contingent basis. Elected officials and others who were hired prior to 1978 may be eligible after 6 years in accordance with G.L. c. 32, s. 10.

If a participant does not withdraw his or her member pension contributions for retirement benefits upon termination of employment, the participant continues with their ability to receive retirement coverage through the GIC. If the participant withdraws his or her retirement contributions, the subsidized benefit eligibility ends.

Health and Basic Life Insurance Benefits

During the time period between termination of employment and retirement, the participant may continue coverage by paying 100% of the cost of coverage. Upon retirement, the participant may elect coverage. The participant contributes 10%, 15% or 20% of the cost of coverage, depending on the date of retirement.

If the participant has not yet retired, and dies, the survivor may apply for health coverage (if the participant had health and life coverage or life only coverage through the GIC, i.e. was paying 100% of the cost). The survivor would contribute at the 10% rate. If the participant has retired, and then dies, the survivor may elect to continue health coverage, and contribute at the 10% rate. Survivor health coverage continues until the survivor remarries or dies.

# Summary of Principal Plan Provisions (continued)

## Termination of Employment With Less Than Ten Years of Service

No subsidized GIC health or life benefits available. Therefore, no liability will be valued upon this event.

## Disability Retirement

Eligibility

- Ordinary Disability: Non–veterans who become totally and permanently disabled by reason of a non-job related condition with at least 10 years of creditable service (or 15 years creditable service in systems in which the local option contained in G.L. c. 32, s.6(l) has not been adopted).

  Veterans with ten years of creditable service who become totally and permanently disabled by reason of a non-job related condition prior to reaching “maximum age.”

- Accidental Disability: Applies to members who become permanently and totally unable to perform the essential duties of the position as a result of a personal injury sustained or hazard undergone while in the performance of duties. There are no minimum age or service requirements.

Health and Basic Life Insurance Benefits

If the retiree receives an ordinary or accidental disability pension, health and basic life insurance coverage will continue, and participants will contribute either 10%, 15% or 20% of the cost of coverage (subject to the statement below regarding life insurance coverage), depending on when the disability occurred.

If under age 60 at disability, basic life insurance coverage will continue, and the participant can apply for a waiver of premium within 24 months of the disability.

# Summary of Principal Plan Provisions (continued)

## Death in Active Service

Eligibility

Survivors of active employees who had GIC health coverage are eligible to continue health coverage.

Health and Basic Life Insurance Benefits

Health coverage is provided, and survivors contribute at the 10% rate. Survivor health coverage continues until the survivor remarries or dies. Survivors are not eligible for Basic Life Insurance.

## Sick Leave Benefits

Sick leave is earned at the rate of 1.25 days per full payroll month.

Employees can accumulate sick leave hours and convert to a cash payout and/or retiree medical "bank" to use for retiree premium contributions, according to the following provisions. The retiree medical "bank" is used to pay the retiree's share of the medical premium until it runs out.

IBEW Local 103, Teamsters Local 127, CASE Local 127, USW Local 5696-00

- Employees who had 100 Sick Days as of November 1, 2009, are eligible for 50% Cash and 35% Sick Leave Bank of the value of their Sick Leave Balance as of November 1, 2009, paid at the employee's hourly rate at the time of retirement. If balance falls below 100 sick days, payment and sick leave bank are based upon the sick leave balance at the time of retirement.

- Employees who did not have 100 Sick Days as of November 1, 2009 are eligible for 50% Cash payment only of the value of their Sick Leave Balance as of November 1, 2009.

- Sick Leave earned after November 1, 2009, will be paid 20% with no Sick Leave Bank.

Classified, Executive, and USW Local 5696-01:

- Employees are eligible for 50% Cash and 50% Sick Leave Bank of the value of their Sick Leave Balance as of September 30, 1996, paid at the employee's hourly rate at the time of retirement if they have 100 sick days when they retire.

- Sick Leave earned after September 30, 1996 will be paid at 20% with no Sick Leave Bank

Dependent Benefits

Retiree medical bank is available to surviving spouses. If both retiree and spouse die, there is no additional payout or benefit.

# Summary of Principal Plan Provisions (continued)

## Summary of Plan Designs – Medical (Medicare)

| | UniCare State Indemnity Plan Medicare Extension | Fallon Senior Plan | Harvard Pilgrim Medicare Enhance | Health New England MedPlus | Tufts Health Plan Medicare Complement | Tufts Health Plan Medicare Preferred |
|---|---|---|---|---|---|---|
| Deductible | none | none | none | none | none | none |
| Out-Of-Pocket Max | none | none | none | none | none | none |
| | | | | | | |
| Physicians | | | | | | |
| Office Visit | $10 copay | $15 copay | $15 copay | $15 copay | $15 copay | $15 copay |
| Preventive Care | 100% | 100% | 100% | 100% | 100% | 100% |
| Hospitalization | $50 ded/qtr | 100% | 100% | 100% | 100% | 100% |
| Surgery | 100% | 100% | 100% | 100% | 100% | 100% |
| Diagnostic / X-Ray | 100% | 100% | 100% | 100% | 100% | 100% |
| ER | $50 copay | $50 copay | $50 copay | $50 copay | $50 copay | $50 copay |
| Outpatient Mental Health | $10 copay | $15 copay | $15 copay | $15 copay | $15 copay | $15 copay |
| Outpatient Substance Abuse | $10 copay | $15 copay | $15 copay | $15 copay | $15 copay | $15 copay |

# Summary of Principal Plan Provisions (continued)

## Summary of Plan Designs – Medical (Non-Medicare)

| | UniCare State Indemnity Plan / Basic with CIC | UniCare State Indemnity Plan / Community Choice | UniCare State Indemnity Plan / Plus | Harvard Pilgrim Independence Plan |
|---|---|---|---|---|
| | | In-Network Benefits Shown | In-Network Benefits Shown | In-Network Benefits Shown |
| Deductible (single/family) | $500/$1,000 | $500/$1,000 | $500/$1,000 | $500/$1,000 |
| Out-Of-Pocket Max | $5,000/$10,000 | $5,000/$10,000 | $5,000/$10,000 | $5,000/$10,000 |
| Physicians | | | | |
| Primary Care Office Visit (Tier 1/2/3) | $20 copay | $20 copay | $20 copay | $10/$20/$40 copay |
| Specialist Office Visit (Tier 1/2/3) | $20/$30/$40 copay | $25/$30/$45 copay | $25/$30/$45 copay | $10/$20/$40 copay |
| Inpatient Care (Tier 1/2/3)* | $275 | $275 | $275/$500/$1,500 | $275/$500/$1,500 |
| Outpatient Surgery (Tier 1/2/3)* | $110 copay | $110 copay | $110/$110/$250 copay | $150 copay |
| ER | $100 copay | $100 copay | $100 copay | $100 copay |
| Outpatient Mental Health | $20 copay | $20 copay | $20 copay | $10 copay |

**Copay per admission; max one copay / quarter or four copays per year, depending on plan*

# Summary of Principal Plan Provisions (continued)

## Summary of Plan Designs – Medical (Non-Medicare)

| | Navigator by Tufts Health Plan | Harvard Pilgrim Primary Choice Plan | Spirit by Tufts Health Plan | Fallon Community Health Plan Direct Care |
|---|---|---|---|---|
| | In-Network Benefits Shown | | | |
| Deductible (single/family) | $500/$1,000 | $500/$1,000 | $500/$1,000 | $550/$1,100 |
| Out-Of-Pocket Max | $5,000/$10,000 | $5,000/$10,000 | $5,000/$10,000 | $5,000/$10,000 |
| Physicians | | | | |
| Primary Care Office Visit (Tier 1/2/3) | $10/$20/$40 copay | $20 copay | $20 copay | $15 copay |
| Specialist Office Visit (Tier 1/2/3) | $25/$35/$45 copay | $20/$35/$45 copay | $25/$35/$45 copay | $25 copay |
| Inpatient Care (Tier 1/2/3)* | $275/$1,500 | $275/$1,500 | $275/$1,500 | $275 |
| Outpatient Surgery (Tier 1/2/3)* | $150 copay | $150 copay | $150 copay | $110 copay |
| ER | $100 copay | $100 copay | $100 copay | $100 copay |
| Outpatient Mental Health | $10 copay | $20 copay | $20 copay | $15 copay |

**Copay per admission; max one copay / quarter or four copays per year, depending on plan*

# Summary of Principal Plan Provisions (continued)

## Summary of Plan Designs – Medical (Non-Medicare)

| | Fallon Community Health Plan Select Care | Health New England | NHP Care (Neighborhood Health Plan) |
|---|---|---|---|
| Deductible (single/family) | $550/$1,100 | $500/$1,000 | $500/$1,000 |
| Out-Of-Pocket Max | $5,000/$10,000 | $5,000/$10,000 | $5,000/$10,000 |
| Physicians | | | |
| Primary Care Office Visit (Tier 1/2/3) | $20 copay | $20 copay | $20 copay |
| Specialist Office Visit (Tier 1/2/3) | $25/$35/$45 copay | $25/$35/$45 copay | $25/$35/$45 copay |
| Inpatient Care (Tier 1/2/3)* | $275 | $275 | $275 |
| Outpatient Surgery (Tier 1/2/3)* | $125 copay | $110 copay | $110 copay |
| ER | $100 copay | $100 copay | $100 copay |
| Outpatient Mental Health | $20 copay | $20 copay | $25 copay |

**Copay per admission; max one copay / quarter or four copays per year, depending on plan*

# Summary of Principal Plan Provisions (continued)

## Summary of Plan Designs – Prescription Drug (Medicare and Non-Medicare)

| | | All Plans |
|---|---|---|
| Generic | | |
| | Retail | $ 10 |
| | Mail | $ 25 |
| Formulary | | |
| | Retail | $ 30 |
| | Mail | $ 70 |
| Non-Formulary | | |
| | Retail | $65 |
| | Mail | $165 |

## Dental/Vision Care

Upon retirement these benefits are available to participants, but the cost of these benefits are paid in full by the participants. These benefits are not included in the valuation results presented herein.

## Basic Life Insurance

Retirees are eligible for $5,000 Basic Life Insurance. The plan provides for a $5,000 payment upon the death of the participant. Surviving spouses are not eligible for Basic Life Insurance

# Methods and Assumptions

**Actuarial Method** Entry Age Normal Level Percent of Pay Method

**Normal Cost** Determined for each active employee as the Actuarial Present Value of benefits allocated to the valuation year. The benefit attributed to the valuation year is that incremental portion of the total projected benefit earned during the year in accordance with the plan provisions. This allocation is based on each individual's service and expected pay between date of hire and assumed retirement age.

**Accumulated Postretirement Benefit Obligation** The Actuarial Present Value of Benefits allocated to all periods prior to the valuation year.

**Life Insurance** A 10% retention load has been added to the life insurance benefits to cover administrative costs, risk charges, premium taxes, and the carrier's profits.

**Discount Rate** 3.63%

**Medical Trend**

| **Annual Rate of Increase** | | | |
|---|---|---|---|
| Calendar Year | Medical/Rx | EGWP | Admin |
| 2017 | 8.5% | 5% | 5% |
| 2018 | 8.0% | 5% | 5% |
| 2019 | 7.5% | 5% | 5% |
| 2020 | 7.0% | 5% | 5% |
| 2021 | 6.5% | 5% | 5% |
| 2022 | 6.0% | 5% | 5% |
| 2023 | 5.5% | 5% | 5% |
| 2024+ | 5.0% | 5% | 5% |

# Methods and Assumptions (continued)

**Morbidity/Aging**

Medical and Prescription Drug

GASB requires that the costs for retiree benefits be separately identified. Currently, the Commonwealth provides benefits for actives and retirees not eligible for Medicare under one rating structure. However, retirees utilize benefits at a greater rate than the active population, due in part to their age. When using a one rate structure basis, the active employees are "implicitly" subsidizing the retiree cost of the plan of benefits in the GIC rate basis. GASB requires that the Commonwealth utilize actual experience or actuarial adjustments in order to calculate the true cost of retiree benefits in order to calculate the present value of the retiree benefits. The actuarial assessment of the best estimate of retiree cost of benefits is premised on utilizing the morbidity/aging table above and the claims costs by age shown in the tables below.

The following assumptions are assumed to follow the annual increase due to aging:

- Medical and prescription drug claims costs
- Medical and prescription drug Medicare offsets
- Retiree contributions

| Age | Annual Increase |
|---|---|
| 20 - 44 | 3.3% |
| 45 - 49 | 3.8% |
| 50 - 54 | 4.3% |
| 55 - 59 | 4.4% |
| 60 - 64 | 3.8% |
| 65 - 69 | 3.1% |
| 70 - 74 | 2.1% |
| 75 - 79 | 1.4% |
| 80 - 84 | 1.3% |
| 85 - 89 | 0.6% |
| 90 or Older | 0.0% |

# Methods and Assumptions (continued)

**Excise Tax ("Cadillac Tax") on High Cost Plans**

For the excise tax, the overall value of the benefit was compared to the excise tax threshold. The values of the benefits were assumed to increase with the valuation trend and the excise tax thresholds were assumed to increase by 3.0% per year.

On a blended basis, the value of benefits reaches the excise tax threshold in 2046. The effect of the excise tax is estimated to result in **1.09%** and **3.44%** increases in the actuarial accrued liability and normal cost respectively.

**Other Requirements of the Patient Protection and Affordable Care Act**

For purposes of this valuation, the following aspects of Health Reform have been incorporated in our development of the underlying claim costs:

- Extended coverage for children
- 100% coverage of preventive care

Other aspects of Health Reform, noted below, result in no additional employer liability:

- Elimination of lifetime maximum benefits
- Removal of the limits on essential health care

# Methods and Assumptions (continued)

The medical and prescription drugs per capita costs were based on the claims and enrollment for the time period July 1, 2015 through June 30, 2016, separately for pre-65 vs. post-65 and separately for the different plans. The experience was converted to incurred basis, adjusted for demographics and plan changes and trended to the valuation period.

The EGWP per capita reimbursements were based on the claims and enrollment for the time period January 1, 2016 – December 31, 2016, adjusted for demographics and trended to the valuation period.

Administrative costs were assumed to be 5% of the pre-65 costs and 10% of the post-65 costs.

**Per Member Claim Costs for Calendar Year 2017**

| | Indemnity / Blend 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Total Cost of Health Care Before Subsidies and Retiree Cost Sharing | Medicare Adjustment | Total Cost of Health Care Before Retiree Cost Sharing | Contributions for Retirees who Retired Prior to 7/1/94 | Contributions for Spouses of Retirees who Retired Prior to 7/1/94 | Contributions for Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Spouses of Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Retirees who Retired After 10/1/09 | Contributions for Spouses of Retirees who Retired After 10/1/09 |
| 25 | $4,160 | $0 | $4,160 | ($501) | ($668) | ($671) | ($896) | ($841) | ($1,124) |
| 30 | $4,779 | $0 | $4,779 | ($589) | ($786) | ($789) | ($1,054) | ($989) | ($1,322) |
| 35 | $5,507 | $0 | $5,507 | ($693) | ($925) | ($928) | ($1,240) | ($1,163) | ($1,555) |
| 40 | $6,364 | $0 | $6,363 | ($815) | ($1,088) | ($1,092) | ($1,458) | ($1,369) | ($1,829) |
| 45 | $7,371 | $0 | $7,371 | ($959) | ($1,279) | ($1,284) | ($1,715) | ($1,610) | ($2,152) |
| 50 | $8,749 | $0 | $8,749 | ($1,156) | ($1,542) | ($1,548) | ($2,067) | ($1,940) | ($2,593) |
| 55 | $10,647 | $0 | $10,647 | ($1,426) | ($1,903) | ($1,910) | ($2,551) | ($2,394) | ($3,200) |
| 60 | $13,049 | $0 | $13,049 | ($1,769) | ($2,360) | ($2,369) | ($3,164) | ($2,969) | ($3,969) |
| 65 | $15,432 | ($11,404) | $4,028 | ($434) | ($434) | ($603) | ($603) | ($772) | ($772) |
| 70 | $17,896 | ($13,284) | $4,613 | ($506) | ($506) | ($703) | ($703) | ($899) | ($899) |
| 75 | $19,803 | ($14,739) | $5,064 | ($561) | ($561) | ($779) | ($779) | ($998) | ($998) |
| 80 | $21,193 | ($15,800) | $5,393 | ($602) | ($602) | ($836) | ($836) | ($1,069) | ($1,069) |
| 85 | $22,575 | ($16,854) | $5,721 | ($642) | ($642) | ($891) | ($891) | ($1,141) | ($1,141) |
| 90 | $23,245 | ($17,366) | $5,879 | ($661) | ($661) | ($918) | ($918) | ($1,175) | ($1,175) |

# Methods and Assumptions (continued)

**Per Member Claim Costs for Calendar Year 2017**

| | POS / PPO / Blend 2 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Total Cost of Health Care Before Subsidies and Retiree Cost Sharing | Medicare Adjustment | Total Cost of Health Care Before Retiree Cost Sharing | Contributions for Retirees who Retired Prior to 7/1/94 | Contributions for Spouses of Retirees who Retired Prior to 7/1/94 | Contributions for Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Spouses of Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Retirees who Retired After 10/1/09 | Contributions for Spouses of Retirees who Retired After 10/1/09 |
| 25 | $3,263 | $0 | $3,263 | ($267) | ($382) | ($401) | ($572) | ($534) | ($763) |
| 30 | $3,753 | $0 | $3,753 | ($314) | ($449) | ($471) | ($673) | ($629) | ($898) |
| 35 | $4,330 | $0 | $4,330 | ($370) | ($528) | ($555) | ($792) | ($739) | ($1,056) |
| 40 | $5,007 | $0 | $5,007 | ($435) | ($621) | ($652) | ($932) | ($870) | ($1,242) |
| 45 | $5,806 | $0 | $5,806 | ($512) | ($731) | ($767) | ($1,096) | ($1,023) | ($1,461) |
| 50 | $6,897 | $0 | $6,897 | ($616) | ($880) | ($925) | ($1,320) | ($1,233) | ($1,761) |
| 55 | $8,400 | $0 | $8,400 | ($761) | ($1,087) | ($1,141) | ($1,630) | ($1,522) | ($2,173) |
| 60 | $10,302 | $0 | $10,302 | ($944) | ($1,348) | ($1,415) | ($2,021) | ($1,887) | ($2,695) |
| 65 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 70 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 75 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 80 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 85 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 90 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

# Methods and Assumptions (continued)

**Per Member Claim Costs for Calendar Year 2017**

| | HMO / Blend 3 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Total Cost of Health Care Before Subsidies and Retiree Cost Sharing | Medicare Adjustment | Total Cost of Health Care Before Retiree Cost Sharing | Contributions for Retirees who Retired Prior to 7/1/94 | Contributions for Spouses of Retirees who Retired Prior to 7/1/94 | Contributions for Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Spouses of Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Retirees who Retired After 10/1/09 | Contributions for Spouses of Retirees who Retired After 10/1/09 |
| 25 | $3,350 | $0 | $3,350 | ($205) | ($303) | ($308) | ($454) | ($410) | ($605) |
| 30 | $3,860 | $0 | $3,860 | ($241) | ($356) | ($362) | ($534) | ($483) | ($712) |
| 35 | $4,461 | $0 | $4,461 | ($284) | ($419) | ($426) | ($628) | ($568) | ($838) |
| 40 | $5,168 | $0 | $5,168 | ($334) | ($493) | ($501) | ($739) | ($668) | ($985) |
| 45 | $5,998 | $0 | $5,998 | ($393) | ($580) | ($589) | ($869) | ($785) | ($1,159) |
| 50 | $7,135 | $0 | $7,135 | ($473) | ($698) | ($710) | ($1,048) | ($946) | ($1,397) |
| 55 | $8,700 | $0 | $8,700 | ($584) | ($862) | ($876) | ($1,293) | ($1,168) | ($1,724) |
| 60 | $10,682 | $0 | $10,682 | ($724) | ($1,069) | ($1,086) | ($1,604) | ($1,449) | ($2,138) |
| 65 | $12,779 | ($9,240) | $3,539 | ($335) | ($335) | ($503) | ($503) | ($671) | ($671) |
| 70 | $14,811 | ($10,764) | $4,047 | ($391) | ($391) | ($586) | ($586) | ($781) | ($781) |
| 75 | $16,384 | ($11,942) | $4,442 | ($433) | ($433) | ($650) | ($650) | ($867) | ($867) |
| 80 | $17,530 | ($12,802) | $4,728 | ($465) | ($465) | ($697) | ($697) | ($929) | ($929) |
| 85 | $18,670 | ($13,656) | $5,014 | ($495) | ($495) | ($743) | ($743) | ($991) | ($991) |
| 90 | $19,223 | ($14,071) | $5,152 | ($511) | ($511) | ($766) | ($766) | ($1,021) | ($1,021) |

# Methods and Assumptions (continued)

## Data Assumptions

**Age Difference/ % Married**

Males are assumed to be 3 years older than females. Active employees are assumed to be 80% married and choose family coverage at retirement.

**Coverage**

We have assumed that:

- 100% of all retirees who currently have health care coverage will continue with the same coverage, except that retirees under age 65 with POS/PPO coverage switch to Indemnity at age 65 and those over age 65 with POS/PPO coverage switch to HMO.
- All current retirees, other than those indicated on the census data as not being eligible by Medicare, have Medicare coverage upon attainment of age 65, as do their spouses. All future retirees are assumed to have Medicare coverage upon attainment of age 65.
- 80% of current and future contingent eligible participants will elect health care benefits at age 55, or current age if later.
- Actives, upon retirement, take coverage, and will be assumed to have the following coverage:

| Retirement Age: | Under 65 | Age 65 + |
|---|---|---|
| Indemnity | 40% | 85% |
| POS/PPO | 50% | 0% |
| HMO | 10% | 15% |

# Methods and Assumptions (continued)

**Mortality**

Pre-retirement mortality reflects RP-2014 Blue Collar Employees table projected generationally with Scale MP-2016 set forward 1 year for females.

Post-retirement mortality reflects RP-2014 Blue Collar Healthy Annuitant table projected generationally with Scale MP-2016 set forward 1 year for females

For disabled members, the mortality rate is assumed to be in accordance with the RP-2000 Healthy

**Retirement Age**

Retirement rates are shown on the following pages. These rates are consistent with the rates used by PERAC for GASB 68.

**Turnover**

Turnover rates are shown on the following pages. These rates are consistent with the rates used by PERAC for GASB 68.

**Disability**

Disability rates are shown on the following pages. These rates are consistent with the rates used by PERAC for GASB 68.

**Valuation Methodology and Terminology**

We have used GASB accounting methodology to determine the postretirement medical benefit obligations.

**Amortization Period**

The amortization cost for the initial Unfunded Actuarial Accrued Liability is a level percentage of payroll for a closed period of 30 years. This has been calculated assuming the amortization payment increases at a rate of 4.5% per year.

**Salary Scale**

Assumed at a rate of 4.5% per year.

**Changes Since Prior Valuation**

- Excise tax impact was updated.
- Trend tables were updated.
- Mortality assumption was updated as a result of the recent experience study done by PERAC.
- The discount rate was changed from 4.50% to 3.63% to better align the results from GASB 45 with GASB 74 for FYE 2017.
- The cost method was changed from the Projected Unit Credit to Entry Age Normal Level Percent of Pay to better align the results from GASB 45 with GASB 74 for FYE 2017.

# Methods and Assumptions (continued)

The following table shows annual rates of retirement at selected ages:

| RATES OF RETIREMENT (Number Retiring per 1,000 Members) | | | AGE | | |
|---|---|---|---|---|---|
| | **50** | **55** | **60** | **65** | **70** |
| *Job Group 1* | | | | | |
| Male | 30 | 35 | 90 | 200 | 1,000 |
| Female | 30 | 50 | 75 | 200 | 1,000 |
| *Job Group 2* | | | | | |
| Male | 20 | 75 | 150 | 200 | 1,000 |
| Female | 20 | 75 | 150 | 200 | 1,000 |
| *Job Group 3* | | | | | |
| Male | 50 | 100 | 140 | 250 | 1,000 |
| Female | 50 | 100 | 140 | 250 | 1,000 |
| *Job Group 4* | | | | | |
| Male | 60 | 250 | 200 | 500 | 1,000 |
| Female | 60 | 250 | 200 | 500 | 1,000 |

# Methods and Assumptions (continued)

The following table shows sample annual rates of withdrawal for Job Groups 1 and 2:

| RATES OF WITHDRAWAL (Number of Withdrawals Per 1,000 Members) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | YEARS OF SERVICE | | | | | | | | | | |
| **Age** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10+** |
| 20 | 270 | 250 | 220 | 150 | 150 | 120 | 90 | 80 | 80 | 60 | 45 |
| 25 | 250 | 220 | 190 | 140 | 130 | 110 | 90 | 80 | 80 | 60 | 45 |
| 30 | 230 | 180 | 150 | 130 | 120 | 100 | 90 | 80 | 55 | 55 | 45 |
| 35 | 180 | 140 | 130 | 120 | 110 | 90 | 80 | 65 | 50 | 50 | 33 |
| 40 | 160 | 120 | 110 | 95 | 90 | 80 | 70 | 60 | 45 | 35 | 30 |
| 45 | 150 | 100 | 85 | 80 | 70 | 70 | 55 | 50 | 40 | 35 | 30 |
| 50 | 180 | 90 | 80 | 70 | 65 | 60 | 50 | 50 | 35 | 30 | 30 |
| 55 | 180 | 100 | 80 | 60 | 60 | 50 | 40 | 40 | 30 | 25 | 0 |
| 60 | 180 | 100 | 80 | 75 | 75 | 50 | 50 | 35 | 35 | 35 | 0 |
| 65+ | 250 | 150 | 150 | 150 | 150 | 120 | 100 | 100 | 80 | 70 | 0 |

# Methods and Assumptions (continued)

The following table shows sample annual rates of withdrawal for Job Groups 3 and 4:

| RATES OF WITHDRAWAL (Number of Withdrawals per 1,000 Members) | | | | | |
|---|---|---|---|---|---|
| | YEARS OF SERVICE | | | | |
| **All Ages** | **1** | **5** | **10** | **15** | **20+** |
| *Job Group 3* | | | | | |
| Unisex | 7 | 7 | 5 | 5 | 5 |
| *Job Group 4* | | | | | |
| Unisex | 90 | 60 | 35 | 20 | 15 |

# Methods and Assumptions (continued)

The following table shows sample annual rates of disability at selected ages:

**RATES OF DISABILITY**
**(Number becoming disabled per 10,000 Members)**

| | AGE | | | | | | |
|---|---|---|---|---|---|---|---|
| | **25** | **30** | **35** | **40** | **45** | **50** | **55** |
| *Job Group 1* | | | | | | | |
| Unisex | 1 | 1 | 3.4 | 6.8 | 10 | 13.3 | 14 |
| *Job Group 2* | | | | | | | |
| Unisex | 6.2 | 7.2 | 10 | 21 | 30 | 42 | 50 |
| *Job Group 3* | | | | | | | |
| Unisex | 11 | 16 | 23 | 36 | 58 | 94 | 190 |
| *Job Group 4* | | | | | | | |
| Unisex | 20 | 21 | 40 | 71 | 100 | 110 | 80 |

# Glossary

## Actuarial accrued liability

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of OPEB plan benefits and expenses which is not provided for by future Normal Costs.

## Actuarial assumptions

Assumptions as to the occurrence of future events affecting costs, such as: mortality, withdrawal, disablement and retirement; changes in compensation and Government provided benefits; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

## Actuarial cost method

A procedure for determining the Actuarial Present Value of OPEB plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

## Actuarial experience gain or loss

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

## Actuarial present value of total projected benefits

Total projected benefits include all benefits estimated to be payable to plan members (retirees and beneficiaries, terminated employees entitled to benefits but not yet receiving them, and current active members) as a result of their service through the valuation date and their expected future service. The actuarial present value of total projected benefits as of the valuation date is the present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment. Expressed another way, it is the amount that would have to be invested on the valuation date so that the amount invested plus investment earnings will provide sufficient assets to pay total projected benefits when due.

## Actuarial valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for an OPEB plan.

## Actuarial valuation date

The date as of which an actuarial valuation is performed.

## Actuarial value of assets

The value of cash, investments and other property belonging to a plan, as used by the actuary for the purpose of an Actuarial Valuation.

# Glossary (continued)

## Amortization (of unfunded actuarial accrued liability)

The portion of the OPEB plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability or the Unfunded Frozen Actuarial Accrued Liability.

## Annual OPEB cost

An accrual-basis measure of the periodic cost of an employer's participation in a defined benefit OPEB plan.

## Annual required contributions of the employer (ARC)

The employer's periodic required contributions to a defined benefit OPEB plan.

## Covered Group

Plan members included in an actuarial valuation.

## Defined benefit OPEB plan

An OPEB plan having terms that specify the benefits to be provided at or after separation from employment. The benefits may be specified in dollars (for example, a flat dollar payment or an amount based on one or more factors such as age, years of service, and compensation), or as a type or level of coverage (for example, prescription drugs or a percentage of health care insurance premiums).

## Employer's contributions

Contributions made in relation to the annual required contributions of the employer (ARC). An employer has made a contribution in relation to the ARC if the employer has (a) made payments of benefits directly to or on behalf of a retiree or beneficiary, (b) made premium payments to an insurer, or (c) irrevocably transferred assets to a trust, or equivalent arrangement, in which plan assets are dedicated to providing benefits to retirees and their beneficiaries in accordance with the terms of the plan and are legally protected from creditors of the employer(s) of plan administrator. Employer's contributions generally *do not equate* to benefits paid.

## Entry Age Normal

A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the Actuarial accrued liability.

## Funded ratio

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

## Funding excess

The excess of the actuarial value of assets over the actuarial accrued liability.

# Glossary (continued)

## Funding policy

The program for the amounts and timing of contributions to be made by plan members, employer(s), and other contributing entities (for example, state government contributions to a local government plan) to provide the benefits specified by an OPEB plan.

## Health care 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 health care services, plan design, and technological developments.

## Implicit Rate Subsidy

The differential between utilizing a blend of active and non-Medicare retiree experience for cost of benefits, and utilizing solely the expected retiree experience. Blending a lower cost active cohort with retirees' results in an implicit rate subsidy for the retirees of the entire group

## Inactives

Certain former employees with a minimum amount of years of creditable service who have left contributions in the state retirement system.

## Investment return assumption (discount rate)

The rate used to adjust a series of future payments to reflect the time value of money.

## Level percentage of projected payroll amortization method

Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years. The dollar amount of the payments generally will increase over time as payroll increases due to inflation; in dollars adjusted for inflation, the payments can be expected to remain level.

## Market-related value of plan assets

A term used with reference to the actuarial value of assets. A market related value may be fair value, market value (or estimated market value), or a calculated value that recognizes changes in fair or market value over a period of, for example, three to five years.

## Net OPEB obligation

The cumulative difference since the effective date of this Statement between annual OPEB cost and the employer's contributions to the plan, including the OPEB liability (asset) at transition, if any, and excluding (a) short-term differences and (b) unpaid contributions that have been converted to OPEB-related debt.

## Normal cost

That portion of the Actuarial Present Value of OPEB plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. In GASB 45, the term refers to employer normal cost.

# Glossary (continued)

## OPEB assets

The amount recognized by an employer for contributions to an OPEB plan greater than OPEB expense.

## OPEB expenditures

The amount recognized by an employer in each accounting period for contributions to an OPEB plan on the modified accrual basis of accounting.

## OPEB expense

The amount recognized by an employer in each accounting period for contributions to an OPEB plan on the accrual basis of accounting.

## OPEB liabilities

The amount recognized by an employer for contributions to an OPEB plan less than OPEB expense/expenditures.

## Other postemployment benefits

Postemployment benefits other than pension benefits. Other postemployment benefits (OPEB) include postemployment health care benefits, regardless of the type of plan that provides them, and all postemployment benefits provided separately from a pension plan, excluding benefits defined as termination offers and benefits.

## Pay-as-you-go

A method of financing an OPEB plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

## Plan assets

Resources, usually in the form of stocks, bonds, and other classes of investments, that have been 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, (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.

## Plan members

The individuals covered by the terms of an OPEB plan. The plan membership generally includes employees in active service, terminated employees who have accumulated benefits but are not yet receiving them, and retired employees and beneficiaries currently receiving benefits.

## Postemployment

The period between termination of employment and retirement as well as the period after retirement.

# Glossary (continued)

## Postemployment health care benefits

Medical, dental, vision, and other health-related benefits provided to terminated or retired employees and their dependents and beneficiaries.

## Postretirement benefit increase

An increase in the benefits of retirees or beneficiaries granted to compensate for the effects of inflation (cost-of-living adjustment) or for other reasons. Ad hoc increases may be granted periodically by a decision of the board of trustees, legislature, or other authoritative body; both the decision to grant an increase and the amount of the increase are discretionary. Automatic increases are periodic increases specified in the terms of the plan; they are nondiscretionary except to the extent that the plan terms can be changed.

## Required supplementary information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

## Single-employer plan

A plan that covers the current and former employees, including beneficiaries, of only one employer.

## Sponsor

The entity that established the plan. The sponsor generally is the employer or one of the employers that participate in the plan to provide benefits for their employees. Sometimes, however, the sponsor establishes the plan for the employees of other entities but does not include its own employees and, therefore, is not a participating employer of that plan. An example is a state government that establishes a plan for the employees of local governments within the state, but the employees of the state government are covered by a different plan.

## Substantive plan

The terms of an OPEB plan as understood by the employer(s) and plan members.

## Transition year

The fiscal year in which this Statement is first implemented.

## Unfunded actuarial accrued liability (unfunded actuarial liability)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

# Appendix A

## Commonwealth of Massachusetts
## Health Plan Providers

The following chart summarizes the various health plan providers (by type, i.e., Indemnity, POS/PPO, and HMO) utilized by the participants included in this valuation.

**Indemnity (Blend 1)**
Commonwealth Indemnity Plan

**POS/PPO (Blend 2)**
Commonwealth Indemnity Plan PLUS
Commonwealth Indemnity Plan Community CHOICE
Commonwealth PPO – Tufts Health Plan Navigator
Harvard Pilgrim POS

**HMO (Blend 3)**
Fallon Senior Plan
Harvard Pilgrim Medicare Enhance
Health New England MedPlus
Tufts Health Plan Medicare Complement
Tufts Health Plan Medicare Preferred
Harvard Pilgrim Primary Choice Plan
Spirit by Tufts Health Plan
Fallon Community Health Plan Direct Care
Fallon Community Health Plan Select Care
Health New England
NHP Care (Neighborhood Health Plan)

# Appendix B

## Detailed Breakdown of Per Member Claim Costs for Calendar Year 2017

| | Indemnity / Blend 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | (1) Medical Cost | (2) Medicare Adjustment | (3) Prescription Cost | (4) Administrative Cost | (5) = (1) + (2) + (3) + (4) Total Cost of Health Care Before Retiree Cost Sharing | Contributions for Retirees who Retired Prior to 7/1/94 | Contributions for Spouses of Retirees who Retired Prior to 7/1/94 | Contributions for Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Spouses of Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Retirees who Retired After to 10/1/09 | Contributions for Spouses of Retirees who Retired After to 10/1/09 |
| 25 | $2,968 | $0 | $544 | $648 | $4,160 | ($501) | ($668) | ($671) | ($896) | ($841) | ($1,124) |
| 30 | $3,491 | $0 | $640 | $648 | $4,779 | ($589) | ($786) | ($789) | ($1,054) | ($989) | ($1,322) |
| 35 | $4,107 | $0 | $752 | $648 | $5,507 | ($693) | ($925) | ($928) | ($1,240) | ($1,163) | ($1,555) |
| 40 | $4,830 | $0 | $885 | $648 | $6,363 | ($815) | ($1,088) | ($1,092) | ($1,458) | ($1,369) | ($1,829) |
| 45 | $5,682 | $0 | $1,041 | $648 | $7,371 | ($959) | ($1,279) | ($1,284) | ($1,715) | ($1,610) | ($2,152) |
| 50 | $6,847 | $0 | $1,254 | $648 | $8,749 | ($1,156) | ($1,542) | ($1,548) | ($2,067) | ($1,940) | ($2,593) |
| 55 | $8,451 | $0 | $1,548 | $648 | $10,647 | ($1,426) | ($1,903) | ($1,910) | ($2,551) | ($2,394) | ($3,200) |
| 60 | $10,481 | $0 | $1,920 | $648 | $13,049 | ($1,769) | ($2,360) | ($2,369) | ($3,164) | ($2,969) | ($3,969) |
| 65 | $12,629 | ($11,404) | $2,314 | $489 | $4,028 | ($434) | ($434) | ($603) | ($603) | ($772) | ($772) |
| 70 | $14,712 | ($13,284) | $2,696 | $489 | $4,613 | ($506) | ($506) | ($703) | ($703) | ($899) | ($899) |
| 75 | $16,323 | ($14,739) | $2,991 | $489 | $5,064 | ($561) | ($561) | ($779) | ($779) | ($998) | ($998) |
| 80 | $17,498 | ($15,800) | $3,206 | $489 | $5,393 | ($602) | ($602) | ($836) | ($836) | ($1,069) | ($1,069) |
| 85 | $18,666 | ($16,854) | $3,420 | $489 | $5,721 | ($642) | ($642) | ($891) | ($891) | ($1,141) | ($1,141) |
| 90 | $19,232 | ($17,366) | $3,524 | $489 | $5,879 | ($661) | ($661) | ($918) | ($918) | ($1,175) | ($1,175) |

# Appendix B (continued)

## Detailed Breakdown of Per Member Claim Costs for Calendar Year 2017

| | POS / PPO / Blend 2 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | (1) Medical Cost | (2) Medicare Adjustment | (3) Prescription Cost | (4) Administrative Cost | (5) = (1) + (2) + (3) + (4) Total Cost of Health Care Before Retiree Cost Sharing | Contributions for Retirees who Retired Prior to 7/1/94 | Contributions for Spouses of Retirees who Retired Prior to 7/1/94 | Contributions for Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Spouses of Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Retirees who Retired After to 10/1/09 | Contributions for Spouses of Retirees who Retired After to 10/1/09 |
| 25 | $2,205 | $0 | $576 | $482 | $3,263 | ($267) | ($382) | ($401) | ($572) | ($534) | ($763) |
| 30 | $2,593 | $0 | $678 | $482 | $3,753 | ($314) | ($449) | ($471) | ($673) | ($629) | ($898) |
| 35 | $3,051 | $0 | $797 | $482 | $4,330 | ($370) | ($528) | ($555) | ($792) | ($739) | ($1,056) |
| 40 | $3,588 | $0 | $937 | $482 | $5,007 | ($435) | ($621) | ($652) | ($932) | ($870) | ($1,242) |
| 45 | $4,221 | $0 | $1,103 | $482 | $5,806 | ($512) | ($731) | ($767) | ($1,096) | ($1,023) | ($1,461) |
| 50 | $5,086 | $0 | $1,329 | $482 | $6,897 | ($616) | ($880) | ($925) | ($1,320) | ($1,233) | ($1,761) |
| 55 | $6,278 | $0 | $1,640 | $482 | $8,400 | ($761) | ($1,087) | ($1,141) | ($1,630) | ($1,522) | ($2,173) |
| 60 | $7,786 | $0 | $2,034 | $482 | $10,302 | ($944) | ($1,348) | ($1,415) | ($2,021) | ($1,887) | ($2,695) |
| 65 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 70 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 75 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 80 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 85 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 90 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

# Appendix B (continued)

## Detailed Breakdown of Per Member Claim Costs for Calendar Year 2017

| | HMO / Blend 3 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | (1) Medical Cost | (2) Medicare Adjustment | (3) Prescription Cost | (4) Administrative Cost | (5) = (1) + (2) + (3) + (4) Total Cost of Health Care Before Retiree Cost Sharing | Contributions for Retirees who Retired Prior to 7/1/94 | Contributions for Spouses of Retirees who Retired Prior to 7/1/94 | Contributions for Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Spouses of Retirees who Retired Between 7/1/94 and 10/1/09 | Contributions for Retirees who Retired After to 10/1/09 | Contributions for Spouses of Retirees who Retired After to 10/1/09 |
| 25 | $2,330 | $0 | $567 | $453 | $3,350 | ($205) | ($303) | ($308) | ($454) | ($410) | ($605) |
| 30 | $2,740 | $0 | $667 | $453 | $3,860 | ($241) | ($356) | ($362) | ($534) | ($483) | ($712) |
| 35 | $3,224 | $0 | $784 | $453 | $4,461 | ($284) | ($419) | ($426) | ($628) | ($568) | ($838) |
| 40 | $3,792 | $0 | $923 | $453 | $5,168 | ($334) | ($493) | ($501) | ($739) | ($668) | ($985) |
| 45 | $4,460 | $0 | $1,085 | $453 | $5,998 | ($393) | ($580) | ($589) | ($869) | ($785) | ($1,159) |
| 50 | $5,374 | $0 | $1,308 | $453 | $7,135 | ($473) | ($698) | ($710) | ($1,048) | ($946) | ($1,397) |
| 55 | $6,633 | $0 | $1,614 | $453 | $8,700 | ($584) | ($862) | ($876) | ($1,293) | ($1,168) | ($1,724) |
| 60 | $8,227 | $0 | $2,002 | $453 | $10,682 | ($724) | ($1,069) | ($1,086) | ($1,604) | ($1,449) | ($2,138) |
| 65 | $9,914 | ($9,240) | $2,412 | $453 | $3,539 | ($335) | ($335) | ($503) | ($503) | ($671) | ($671) |
| 70 | $11,548 | ($10,764) | $2,810 | $453 | $4,047 | ($391) | ($391) | ($586) | ($586) | ($781) | ($781) |
| 75 | $12,813 | ($11,942) | $3,118 | $453 | $4,442 | ($433) | ($433) | ($650) | ($650) | ($867) | ($867) |
| 80 | $13,735 | ($12,802) | $3,342 | $453 | $4,728 | ($465) | ($465) | ($697) | ($697) | ($929) | ($929) |
| 85 | $14,652 | ($13,656) | $3,565 | $453 | $5,014 | ($495) | ($495) | ($743) | ($743) | ($991) | ($991) |
| 90 | $15,097 | ($14,071) | $3,673 | $453 | $5,152 | ($511) | ($511) | ($766) | ($766) | ($1,021) | ($1,021) |

# About Aon

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