# Vermont State Teachers' Retirement System

**Governmental Accounting Standards Board (GASB) Statement No. 67 Accounting Valuation Report as of June 30, 2018**

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*November 6, 2018*

*Board of Trustees*
*Vermont State Teachers' Retirement System*
*Montpelier, Vermont 05609*

*Dear Board Members:*

*We are pleased to submit this Governmental Accounting Standards Board (GASB) Statement No. 67 Accounting Valuation as of June 30, 2018 for the Vermont State Teachers' Retirement System, a cost-sharing multiple-employer defined benefit pension plan. It contains the actuarial information that will need to be disclosed in order to comply with GASB 67.*

*This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist the Board and the member units in preparing their financial reports. The financial information on which our calculations were based was provided by the Office of the State Treasurer. That assistance is gratefully acknowledged.*

*The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.*

*An actuarial valuation is a measurement at a specific date – it is not a prediction of a plan's future financial condition. We have not been retained to perform an analysis of the potential range of financial measurements, except where otherwise noted.*

*The actuarial calculations were directed under the supervision of Kathleen Riley and Matthew Strom. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate.*

*This valuation was prepared based on the actuarial assumptions and methods used in the June 30, 2017, actuarial valuation of the System. In our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the System and are appropriate for purposes of the valuation.*

*We look forward to reviewing this report with you and to answering any questions.*

*Sincerely,*

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

*By:*

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

*Matthew A. Strom, FSA, MAAA, EA*
*Vice President and Actuary*

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## SECTION 1

### VALUATION SUMMARY



## SECTION 2

### ACCOUNTING INFORMATION



## SECTION 3

### SUPPLEMENTAL INFORMATION

**Important Information About Actuarial Valuations**

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System uses an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the Vermont State Teachers' Retirement System. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- Sections of this report may include actuarial results that are not rounded, but that does not imply precision.
- If the System is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The System should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of the System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the System.

## Purpose

This report has been prepared by Segal Consulting to present certain disclosure information required by Governmental Accounting Standards Board Statement No. 67 as of June 30, 2018. This report, based on unaudited financial information as of June 30, 2018, provided by the Office of the State Treasurer and the Vermont State Teachers' Retirement System Actuarial Valuation Report as of June 30, 2017, dated October 23, 2017, reflects:

- The benefit provisions of the Pension Plan, as administered by the Board; and
- The characteristics of covered active members, inactive members, and retired members and beneficiaries as of June 30, 2017, provided by the Office of the State Treasurer.

The assumptions are the same as shown in the Vermont State Teachers' Retirement System Actuarial Valuation Report as of June 30, 2017, except the load on accumulated contributions to value inactive members was lowered from 332.5% to 250%.

## Valuation Highlights

The following key findings were the result of this actuarial valuation:

- The Net Pension Liability (NPL) is equal to the difference between the Total Pension Liability (TPL) and the Plan's Fiduciary Net Position. The Plan's Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) on a market value basis. The NPL increased from $1.48 billion as of June 30, 2017, to $1.51 billion as of June 30, 2018, and the Plan's Fiduciary Net Position as a percent of the TPL increased from 53.98% to 54.81%.
- The NPL, measured as of June 30, 2018, was determined based upon the results of the actuarial valuation as of June 30, 2017, adjusted forward using standard actuarial techniques, updated to reflect the change in the assumption regarding the valuation of inactive members as reported by the System. The NPL, measured as of June 30, 2017, was determined based on the results of the actuarial valuation as of June 30, 2016 (as completed by Buck Consultants), updated to reflect changes in the investment return, inflation, cost of living, salary increase, and mortality assumptions.
- The discount rate used to determine the TPL and NPL as of June 30, 2018, and June 30, 2017, was 7.50%.

## EXHIBIT 1

### Net Pension Liability

The components of the net pension liability of the Vermont State Teachers' Retirement System are as follows:

| | June 30, 2018 | June 30, 2017 |
|---|---|---|
| Total pension liability | $3,343,078,028 | $3,220,961,088 |
| Plan fiduciary net position | 1,832,372,553 | 1,738,557,573 |
| System's net pension liability | 1,510,705,475 | 1,482,403,515 |
| Plan fiduciary net position as a percentage of the total pension liability* | 54.81% | 53.98% |

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

*Actuarial assumptions.* The total pension liability as of June 30, 2018, was determined by rolling forward the total pension liability as of June 30, 2017, to June 30, 2018, using the following actuarial assumptions:

| | |
|---|---|
| Inflation | 2.50% |
| Salary increases | Ranging from 3.75% to 9.09% |
| Investment rate of return | 7.50%, net of pension plan investment expenses, including inflation |
| Cost of Living Adjustment | 2.55% (2.60% for 2019) for Group A members and 1.40% (1.30% for 2019) for Group C members |
| Mortality | |
| *Pre-retirement*: | 98% of RP-2006 White Collar Employee Table with generational improvement |
| *Healthy Retiree*: | 98% of RP-2006 White Collar Annuitant Table with generational improvement |
| *Disabled Retiree*: | RP-2006 Disabled Mortality Table with generational improvement |

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of June 30, 2018, is summarized in the following table:

| Asset Class | Target Allocation | Long-Term Expected Real Rate of Return* |
|---|---|---|
| US Equity | 18.00% | 6.10% |
| Non-US Equity | 16.00% | 7.45% |
| Global Equity | 9.00% | 6.74% |
| Fixed Income | 26.00% | 2.25% |
| Real Estate | 8.00% | 5.11% |
| Private Markets | 15.00% | 7.60% |
| Hedge Funds | 8.00% | 3.86% |
| | 100.00% | |

*Discount rate:* The discount rate used to measure the total pension liability was 7.50%. In accordance with paragraph 43 of GASB 67, professional judgement was applied to determine that the System's projected fiduciary net position exceeds projected benefit payments for current active and inactive members for all years. Our analysis was based on the expectation that the employer will continue to contribute an amount at least equal to the actuarially determined contribution, which is comprised of an employer normal cost payment and a payment to reduce the unfunded liability to zero by June 30, 2038, in accordance with Vermont statute. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

*Sensitivity of the net pension liability to changes in the discount rate.* The following presents the net pension liability, calculated using the discount rate of 7.50%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.50%) or 1-percentage-point higher (8.50%) than the current rate:

| | 1% Decrease (6.50%) | Current Discount (7.50%) | 1% Increase (8.50%) |
|---|---|---|---|
| Net pension liability as of June 30, 2018 | $1,824,256,686 | $1,510,705,475 | $1,196,832,321 |

* *As provided by the Vermont State Treasurer's Office*

## EXHIBIT 2

### Schedule of Changes in the Net Pension Liability – Last Ten Years

| | Year End June 30, | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **2018** | **2017** | **2016** | **2015** | **2014** | **2013** | **2012** | **2011** | **2010** | **2009** |
| **Total pension liability** | | | | | | | | | | |
| Service cost | $40,117,462 | $35,383,370 | $34,979,249 | $33,613,557 | $33,143,487 | | | | | |
| Interest | 237,746,182 | 228,938,418 | 222,185,083 | 215,447,502 | 206,150,481 | | | | | |
| Differences between expected and actual experience | 59,468,842 | 12,523,150 | 3,612,809 | 20,002,876 | 0 | | | | | |
| Changes of assumptions | -32,956,623 | 185,849,013 | -7,223,825 | 57,488,610 | 0 | | | | | |
| Changes of benefit terms | 0 | 0 | 0 | 0 | 0 | (Historical information prior to implementation of GASB 67/68 is not required) | | | | |
| Benefit payments, including refunds of employee contributions | -182,258,923 | -172,156,063 | -162,751,410 | -150,732,845 | -140,846,837 | | | | | |
| **Net change in total pension liability** | $122,116,940 | $290,537,888 | $90,801,906 | $175,819,700 | $98,447,131 | | | | | |
| **Total pension liability – beginning** | 3,220,961,088 | 2,930,423,200 | 2,839,621,294 | 2,663,801,594 | 2,565,354,463 | | | | | |
| **Total pension liability – ending (a)** | $3,343,078,028 | $3,220,961,088 | $2,930,423,200 | $2,839,621,294 | $2,663,801,594 | | | | | |
| **Plan fiduciary net position** | | | | | | | | | | |
| Contributions – employer | $110,353,599 | $78,663,674 | $73,225,064 | $72,908,805 | $71,869,736 | | | | | |
| Contributions – employee | 37,888,566 | 36,142,411 | 35,408,763 | 34,863,531 | 32,558,584 | | | | | |
| Net investment income | 125,566,281 | 173,166,614 | 19,877,271 | -7,566,696 | 212,338,194 | | | | | |
| Benefit payments, including refunds of employee contributions | -182,258,923 | -172,156,063 | -162,751,410 | -150,732,845 | -140,846,837 | (Historical information prior to implementation of GASB 67/68 is not required) | | | | |
| Administrative expenses | -2,083,260 | -2,214,235 | -1,797,512 | -2,259,402 | -26,115,813 | | | | | |
| Other | 4,348,717 | 4,055,423 | 3,821,132 | 538,444 | 1,209,177 | | | | | |
| **Net change in fiduciary net position** | $93,814,980 | $117,657,824 | -$32,216,692 | -$52,248,163 | $151,013,041 | | | | | |
| **Plan fiduciary net position – beginning** | 1,738,557,573 | 1,620,899,749 | 1,653,116,441 | 1,705,364,604 | 1,554,351,563 | | | | | |
| **Plan fiduciary net position – ending (b)** | $1,832,372,553 | $1,738,557,573 | $1,620,899,749 | $1,653,116,441 | $1,705,364,604 | | | | | |
| **Net pension liability – ending: (a)-(b)** | $1,510,705,475 | $1,482,403,515 | $1,309,523,451 | $1,186,504,853 | $958,436,990 | | | | | |
| **Plan's fiduciary net position as a percentage of the total pension liability** | 54.81% | 53.98% | 55.31% | 58.22% | 64.02% | (Historical information prior to implementation of GASB 67/68 is not required) | | | | |
| **Covered-employee payroll** | $607,354,756 | $586,397,072 | $557,708,310 | $567,073,601 | $563,623,421 | | | | | |
| **Net pension liability as a percentage of covered-employee payroll** | 248.74% | 252.80% | 234.80% | 209.23% | 170.05% | | | | | |

*Note: Covered-employee payroll reflects actual compensation amounts from the prior Plan year.*

**Notes to Exhibit 2:**

*Changes in Assumptions:* The following change was effective June 30, 2018:

- The valuation liability for inactive members as reported by the System was changed from 332.5% of accumulated contributions to 250.0% of accumulated contributions.

*Changes in Plan Provisions:* There have been no changes in plan provisions since the last measurement date.

## EXHIBIT 3

### Schedule of Contributions – Last Ten Years

| | Year End June 30, | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 |
| Actuarially determined contribution | $88,409,437 | $82,659,576 | $76,102,909 | $72,857,863 | $68,352,825 | | | | | |
| Contributions in relation to the actuarially determined contribution | 114,598,921 | 82,887,174 | 76,947,868 | 72,908,805 | 71,869,736 | | | | | |
| Contribution deficiency (excess) | -$26,189,484 | -$227,598 | -$844,959 | -$50,942 | -$3,516,911 | (Historical information prior to implementation of GASB 67/68 is not required) | | | | |
| Covered-employee payroll | $607,354,756 | $586,397,072 | $557,708,310 | $567,073,601 | $563,623,421 | | | | | |
| Contributions as a percentage of covered-employee payroll | 18.87% | 14.13% | 13.80% | 12.86% | 12.75% | | | | | |

*Note: Actuarially determined contributions for a given fiscal year are based on results from the June 30 actuarial valuation two years prior.*

**Notes to Exhibit 3:**

*Methods and assumptions used to establish the actuarially determined contribution for the year ending June 30, 2018:*

| | |
|---|---|
| *Valuation date* | Actuarially determined contribution for the year ending June 30, 2018 is based on results from the June 30, 2016 actuarial valuation, and was calculated as of June 30, with appropriate interest to the middle of the fiscal year. |
| *Actuarial cost method* | Entry Age Normal actuarial cost method |
| *Amortization method* | Amortization payments calculated to fully fund unfunded actuarial accrued liability with annual increases of 5% over a closed period. |
| *Remaining amortization period* | 22 years as of July 1, 2016 |
| | The amortization of unfunded actuarial accrued liability (UAAL) within the actuarially determined contribution rate calculation is based on the level percentage of pay required to amortize the UAAL over the 30-year closed period that began July 1, 2008. |

**Notes to Exhibit 3 (continued):**

| | |
|---|---|
| *Asset valuation method* | The amount of the assets for valuation purposes equals the preliminary asset value plus 20% of the difference between market and preliminary asset values. The preliminary asset value is equal to the previous year's asset value (for valuation purposes) adjusted for contributions less benefit payments and expenses plus expected investment income. If necessary, a further adjustment is made to ensure that the valuation assets are within 20% of the market value. |

| | |
|---|---|
| *Actuarial assumptions:* | |
| *Investment rate of return* | 7.95%, net of pension plan investment expenses |
| *Inflation rate* | 3.00% to 3.25% |
| *Projected salary increases* | 4.12% to 9.46% |
| *Mortality* | Pre-retirement: |
| | RP-2000 Custom Table |
| | Healthy Retiree: |
| | RP-2000 Projected to 2029 using Scale BB |
| | Disabled Retiree: |
| | RP-2000 with projection to 2020 using Scale AA |
| *Other assumptions:* | Same as those used in the June 30, 2016 actuarial funding valuation |

## EXHIBIT I

### Actuarial Assumptions and Actuarial Cost Method*

| | |
|---|---|
| **Rationale for Assumptions:** | The information and analysis used in selecting each assumption (except for economic assumptions and mortality tables) that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study dated March 2, 2016 (as prepared by Buck Consultants). Economic assumptions, including inflation, investment return, and assumed cost-of-living adjustment increases were studied and adopted by the Board on July 13, 2017. Mortality table assumptions were studied and adopted by the Board on September 25, 2017. Rates of annual increase in salary were modified and adopted by the Board on September 25, 2017. |
| **Roll-forward Techniques:** | The results as of June 30, 2018, are based on the results of the Vermont State Teachers' Retirement System Actuarial Valuation Report as of June 30, 2017, adjusted forward, using standard actuarial techniques. |
| **Inflation:** | 2.50%. |
| **Investment Return:** | 7.50%.<br>The investment return assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment. As part of the analysis, a building block approach was used that reflects inflation expectations and anticipated risk premiums for each of the portfolio's asset classes, as well as the Plan's target asset allocation. |

* *Same assumptions used in the June 30, 2018, Actuarial Valuation and Review.*

**Salary Increases:**

| Age | Annual Rate of Salary Increase % |
|---|---|
| 20 | 9.09% |
| 25 | 7.78% |
| 30 | 6.47% |
| 35 | 5.60% |
| 40 | 4.92% |
| 45 | 4.43% |
| 50 | 4.09% |
| 55 | 3.85% |
| 60 | 3.75% |

**Cost-of-Living Adjustments:** Assumed to occur on January 1 following one year of retirement at the rate of 2.55% per annum for Group A members and 1.40% per annum for Group C members (beginning at age 62 for Group C members who elect reduced early retirement). The January 1, 2019 COLA is assumed to be 2.60% for group A and 1.30% for group C.

**Mortality Rates:**

*Death in Active Service*: All Groups – 98% of RP-2006 White Collar Employee with generational projection using Scale SSA-2017.

*Healthy Post-retirement*: All Groups – 98% of RP-2006 White Collar Annuitant with generational projection using Scale SSA-2017.

*Disabled Post-retirement*: All Groups – RP-2006 Disabled Mortality Table with generational projection using Scale SSA-2017.

The tables with the generational projection to the ages of participants as of the measurement date reasonably reflect the mortality experience of the Plan as of the measurement date. The mortality rates were based on historical and current demographic data, adjusted to reflect health characteristics of the various industries and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual amount of deaths by benefit amount and the projected amount based on the prior assumption over the five-year period ending June

30, 2016. The mortality tables were then adjusted to future years using a generational projection with Scale SSA-2017 to reflect future mortality improvement.

Please note, the description of the mortality table has been changed to be consistent with revised nomenclature related to unprojected rates of mortality used in the RP-2014 series of mortality tables.

**Separation from Service before Retirement (Due to Withdrawal and Disability):**

Representative values of the assumed annual rates of withdrawal and disability are as follows:

| | Rate (%) | | | |
|---|---|---|---|---|
| | Withdrawal | | Disability | |
| Age | Male | Female | Male | Female |
| 25 | 21.00% | 20.00% | 0.005% | 0.008% |
| 30 | 12.60 | 14.00 | 0.008 | 0.008 |
| 35 | 8.40 | 11.30 | 0.010 | 0.008 |
| 40 | 6.50 | 9.03 | 0.015 | 0.010 |
| 45 | 5.80 | 6.30 | 0.026 | 0.023 |
| 50 | 5.40 | 5.25 | 0.067 | 0.070 |
| 55 | 5.40 | 5.04 | 0.044 | 0.048 |
| 60 | 5.40 | 5.04 | 0.147 | 0.084 |

**Retirement Rates:**

| | Reduced Early Retirement | | Full Early Retirement |
|---|---|---|---|
| Age | Group A | Group C | Grandfathered (Group C) |
| 55 | 6.13% | 6.13% | 6.13% |
| 56 | 6.25 | 6.25 | 6.25 |
| 57 | 6.25 | 6.25 | 6.25 |
| 58 | 6.25 | 6.25 | 6.25 |
| 59 | 9.38 | 9.38 | 9.38 |
| 60 | 12.50 | 18.75 | 18.75 |
| 61 | 18.75 | 18.75 | 18.75 |

**Retirement Rates (continued):**

| | Service Retirement | | |
|---|---|---|---|
| | | Group C | |
| Age | Group A | Non-grandfathered | Grandfathered |
| 60 | 12.50% | 17.00% | N/A |
| 61 | 18.80 | 17.00 | N/A |
| 62 | 25.00 | 20.00 | 20.00% |
| 63 | 22.00 | 22.00 | 22.00 |
| 64 | 22.00 | 22.00 | 22.00 |
| 65 | 33.00 | 33.00 | 33.00 |
| 66 | 33.00 | 33.00 | 33.00 |
| 67 | 33.00 | 33.00 | 33.00 |
| 68 | 22.00 | 22.00 | 22.00 |
| 69 | 33.00 | 33.00 | 33.00 |
| 70 | 100.00 | 100.00 | 100.00 |

Non-grandfathered members are assumed to retire with 25% probability if they are first eligible for service retirement on or before age 62 and 27.5% probability if they are first eligible for service retirement between age 62 and age 65.

**Retirement Rates (continued):**

Group A and Grandfathered Group C members are assumed to retire at the following rates upon completion of 30 years of creditable service:

| | Retirement After 30 Years of Service | |
|---|---|---|
| **Age** | **Group A** | **Grandfathered (Group C)** |
| 49 | 0.00% | 0.00% |
| 50 | 40.00 | 40.00 |
| 51 | 20.00 | 20.00 |
| 52 | 20.00 | 20.00 |
| 53 | 20.00 | 20.00 |
| 54 | 20.00 | 20.00 |
| 55 | 20.00 | 8.75 |
| 56 | 10.00 | 6.25 |
| 57 | 10.00 | 6.25 |
| 58 | 10.00 | 10.00 |
| 59 | 10.00 | 10.00 |
| 60 | 30.00 | 25.00 |
| 61 | 25.50 | 17.00 |

The retirement rates were based on historical and current demographic data, adjusted to reflect conditions of the various industries, and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of retirements by age and the projected number based on the prior assumption over the four-year period ending June 30, 2014.

**Inactive Members as Reported by the System:**

Valuation liability equals 250% of accumulated contributions.

**Deferred Members as Reported by the System:**

Assumed to retire at their Normal Retirement Age with a deferred vested benefit.

**Unknown Data for Members:**

Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

| | |
|---|---|
| **Percent Married:** | 85% of male members and 35% of female members are assumed to be married. |
| **Age of Spouse:** | Females three years younger than males. |
| **Benefit Elections:** | All members are assumed to elect the single life annuity option. |
| **Actuarial Cost Method:** | Entry Age Actuarial Cost Method. Entry Age is the age at date of employment or, if date is unknown, current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary, with Normal Cost determined using the plan of benefits applicable to each participant. |
| **Changes Actuarial Assumptions:** | Based on review of recent plan experience, the following actuarial assumption was changed:<br>• Valuation liability for inactive members as reported by the System is assumed to equal 250% of accumulated contributions. Previously, this liability was assumed to equal 332.5% of accumulated contributions. |

## EXHIBIT II
### Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

**Effective Date:** July 1, 1947.

**Creditable Service:** Service as a member plus purchased service.

**Average Final Compensation (AFC):** Average annual compensation during highest 3 consecutive years.

**Grandfathered Status:** Group C members who were within five years of normal retirement eligibility as defined prior to July 1, 2010, are "grandfathered".

**Normal Retirement – Eligibility:**

Group A: Age 60 or 30 years of creditable service.

Group C: Grandfathered – Age 62 or 30 years of creditable service
Non-grandfathered – Age 65 or age plus creditable service equal to 90.

**Normal Retirement – Amount:**

Group A: Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/60th of AFC times creditable service.

Group C: Grandfathered – Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80th of AFC times creditable service prior to July 1, 1990, plus 1/60th of AFC times creditable service after July 1, 1990.
Non-grandfathered – Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80th of AFC times creditable service prior to July 1, 1990, plus 1/60th of AFC times creditable service after July 1, 1990 up to 20 years of service, plus 1/50th of AFC for years of service after 20. If a member already has 20 or more years of service on June 30, 2010, the 1/50th will be applied to all service accrued after July 1, 2010.

Minimum benefit applicable to Group A of $6,600 after 30 years of creditable service (pro-rata for service less than 30 years).

| | | |
|---|---|---|
| | Maximum benefit applicable to Group C: Grandfathered maximum benefit is 50% of AFC up to June 30, 2010. May continue to accrue up to 53.34% of AFC with service earned after July 1, 2010. Non-grandfathered maximum benefit is 60% of AFC. | |
| **Early Retirement – Eligibility:** | Group A: | Age 55. |
| | Group C: | Age 55 with 5 years of creditable service. |
| **Early Retirement – Amount:** | Group A: | Actuarial equivalent of normal retirement allowance using AFC and creditable service at early retirement. |
| | Group C: | Grandfathered – Accrued normal benefit reduced 6% for each year prior to age 62. |
| | | Non-grandfathered – Accrued normal benefit reduced by actuarial reduction from normal retirement age. |
| **Vesting:** | All groups – 5 years of creditable service. Allowance beginning at age 60 calculated as a normal retirement allowance based on AFC and creditable service at termination. | |
| **Disability Retirement – Eligibility:** | All groups – Total and permanent disability after 5 years of creditable service (5 years preceding retirement served in State). | |
| **Disability Retirement – Amount:** | All groups – Calculated as a service allowance based on AFC and creditable service at disability retirement, subject to a 25% of AFC minimum. | |
| **Death Benefit – Eligibility:** | Group A: | Age 60 or 30 years of creditable service; 10 years of creditable service if in service at death. |
| | Group C: | Age 55 and 5 years of creditable service or 10 years of creditable service. |
| **Death Benefit – Amount:** | All groups – Accrued allowance paid under 100% survivorship option. If the eligibility requirements are not met or if beneficiary so elects, the member's accumulated contributions are paid to the beneficiary or estate. Certain children's benefits may also be payable. | |
| **Post-Retirement Adjustments:** | Group A: | Allowances in payment for at least one year increased on each January 1 by the percentage increase in Consumer Price Index, but not more than 5%. |
| | Group C: | Same, but increase is based on half of the Consumer Price Index increase. For members receiving a reduced early retirement allowance, the adjustment will not apply before age 62. |

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| **Refund of Contributions:** | If no other beneficiary is payable, a terminated member receives his accumulated contributions with interest. | |
| **Member Contribution Rates:** | Group A: | 5.5% of earnable compensation. Contributions stop after 25 years of creditable service. |
| | Group C: | 5% of earnable compensation with at least five years of service as of July 1, 2014. 6% of earnable compensation with less than five years of service as of July 1, 2014. |
| **Changes in Plan Provisions** | There have been no changes in plan provisions since the last valuation. | |

## Appendix A
## Glossary

Definitions of certain terms *as they are used in Statements 67/68;* the terms may have different meanings in other contexts.

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| **Active employees:** | Individuals employed at the end of the reporting or measurement period, as applicable. |
| **Actual contributions:** | Cash contributions recognized as additions to a pension plan's fiduciary net position. |
| **Actuarial present value of projected benefit payments:** | Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment. |
| **Actuarial valuation:** | The determination, as of a point in time (the actuarial valuation date), of the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB. |
| **Actuarial valuation date:** | The date as of which an actuarial valuation is performed. |
| **Actuarially determined contribution:** | A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted. |
| **Ad hoc cost-of-living adjustments (ad hoc COLAs):** | Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions. |
| **Ad hoc postemployment benefit changes:** | Postemployment benefit changes that require a decision to grant by the authority responsible for making such decisions. |
| **Agent employer:** | An employer whose employees are provided with pensions through an agent multiple-employer defined benefit pension plan. |

**Agent multiple-employer defined benefit pension plan (agent pension plan):** A multiple-employer defined benefit pension plan in which pension plan assets are pooled for investment purposes but separate accounts are maintained for each individual employer so that each employer's share of the pooled assets is legally available to pay the benefits of only its employees.

**Allocated insurance contract:** A contract with an insurance company under which related payments to the insurance company are currently used to purchase immediate or deferred annuities for individual employees. Also may be referred to as an annuity contract.

**Automatic cost-of-living adjustments (automatic COLAs):** Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

**Automatic postemployment benefit changes:** Postemployment benefit changes that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

**Closed period:** A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.

**Collective deferred outflows of resources and deferred inflows of resources related to pensions:** Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective net pension liability.

**Collective net pension liability:** The net pension liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.

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| **Collective pension expense:** | Pension expense arising from certain changes in the collective net pension liability. |
| **Contributions:** | Additions to a pension plan's fiduciary net position for amounts from employers, nonemployer contributing entities (for example, state government contributions to a local government pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources. |
| **Cost-of-living adjustments:** | Postemployment benefit changes intended to adjust benefit payments for the effects of inflation. |
| **Cost-sharing employer:** | An employer whose employees are provided with pensions through a cost-sharing multiple-employer defined benefit pension plan. |
| **Cost-sharing multiple-employer defined benefit pension plan (cost-sharing pension plan):** | A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan. |
| **Covered-employee payroll:** | The payroll of employees that are provided with pensions through the pension plan. |
| **Deferred retirement option program (DROP):** | A program that permits an employee to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The employee continues to provide service to the employer and is paid for that service by the employer after the DROP entry date; however, the pensions that would have been paid to the employee (if the employee had retired and not entered the DROP) are credited to an individual employee account within the defined benefit pension plan until the end of the DROP period. |
| **Defined benefit pension plans:** | Pension plans that are used to provide defined benefit pensions. |

**Defined benefit pensions:** Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statements 67/68.)

**Defined contribution pension plans:** Pension plans that are used to provide defined contribution pensions.

**Defined contribution pensions:** Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.

**Discount rate:** The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following:

1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension plan's fiduciary net position is projected (under the requirements of Statements 67/68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments.
2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

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| **Entry age actuarial cost method:** | 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*. |
| **Inactive employees:** | Terminated individuals that have accumulated benefits but are not yet receiving them, and retirees or their beneficiaries currently receiving benefits. |
| **Measurement period:** | The period between the prior and the current measurement dates. |
| **Multiple-employer defined benefit pension plan:** | A defined benefit pension plan that is used to provide pensions to the employees of more than one employer. |
| **Net pension liability:** | The liability of employers and nonemployer contributing entities to employees for benefits provided through a defined benefit pension plan. |
| **Nonemployer contributing entities:** | Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statements 67/68, employees are not considered nonemployer contributing entities. |
| **Other postemployment benefits:** | All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits, regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits. |
| **Pension plans:** | Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed, and benefits are paid as they come due. |
| **Pensions:** | Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits. |

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| **Plan members:** | Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members). |
| **Postemployment:** | The period after employment. |
| **Postemployment benefit changes:** | Adjustments to the pension of an inactive employee. |
| **Postemployment healthcare benefits:** | Medical, dental, vision, and other health-related benefits paid subsequent to the termination of employment. |
| **Projected benefit payments:** | All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and their expected future service. |
| **Public employee retirement system:** | A special-purpose government that administers one or more pension plans; also may administer other types of employee benefit plans, including postemployment healthcare plans and deferred compensation plans. |
| **Real rate of return:** | The rate of return on an investment after adjustment to eliminate inflation. |
| **Service costs:** | The portions of the actuarial present value of projected benefit payments that are attributed to valuation years. |
| **Single employer:** | An employer whose employees are provided with pensions through a single-employer defined benefit pension plan. |
| **Single-employer defined benefit pension plan (single-employer pension plan):** | A defined benefit pension plan that is used to provide pensions to employees of only one employer. |
| **Special funding situations:** | Circumstances in which a nonemployer entity is legally responsible for making contributions directly to a pension plan that is used to provide pensions to the employees of another entity or entities and either of the following conditions exists:<br>The amount of contributions for which the nonemployer entity legally is responsible is *not* dependent upon one or more events or circumstances unrelated to the pensions.<br>The nonemployer entity is the only entity with a legal obligation to make contributions directly to a pension plan. |

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| **Termination benefits:** | Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits. |
| **Total pension liability:** | The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement. |

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