

# **Vermont Municipal Employees' Retirement System**

**Actuarial Valuation and  
Review as of June 30, 2017**

The logo for Segal Consulting is a large, dark blue, stylized shape resembling a compass needle or a stylized 'S' with a sharp point at the bottom. It is positioned on the right side of the page, pointing towards the top right.

 Segal Consulting

This report has been prepared at the request of the Board of Trustees to assist in administering the System. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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October 23, 2017

Board of Trustees  
Vermont Municipal Employees' Retirement System  
Montpelier, Vermont 05609

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2017, of the Vermont Municipal Employees' Retirement System. This report summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the actuarially determined contribution requirement for fiscal 2018. The total actuarially determined contribution for the fiscal year beginning July 1, 2017, amounts to \$15,066,601.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement System. The census information and financial information on which our calculations were based was prepared by the Office of the State Treasurer. That assistance is gratefully acknowledged.

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. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the System.

We look forward to reviewing this report and to answering any questions at the next Board meeting.

Sincerely,

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

By:

Handwritten signature of Kathleen A. Riley in blue ink, written over a horizontal line.

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

Handwritten signature of Matthew A. Strom in blue ink, written over a horizontal line.

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

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# Section 1: Actuarial Valuation Summary

## Purpose and Basis

This report was prepared by Segal Consulting to present a valuation of the Plan as of June 30, 2017, pursuant to section 5062 of Title 24, Chapter 125, Vermont Statutes Annotated, relating to the Vermont Municipal Employees' Retirement System. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. 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; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

Certain disclosure information required by GASB Statements No 67 and 68 as of June 30, 2017 for the System is provided in a separate report.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Plan, as administered by the Board;
- 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 unaudited assets of the Plan as of June 30, 2017, provided by the Office of the State Treasurer;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.; and
- The funding policy adopted by the Board of Trustees.

## Valuation Highlights

1. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy set in the Vermont State Pension Code meets this standard.
2. Actual employer contributions made during the fiscal year ending June 30, 2017 were \$16,481,881, or 127.8% of the actuarially determined contribution. In the prior fiscal year, actual employer contributions were \$15,235,742.
3. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability determined under the Entry Age Normal cost method) is 84.1%, compared to the prior year's funded ratio of 86.5%. This ratio is one measure of funding status and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 82.1%, compared to 81.4% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the System's benefit obligation or the need for or the amount of future contributions.
4. The actuarially determined contribution for the upcoming year is \$15,066,601. The contribution as a percentage of payroll increased from 4.64% of payroll to 5.22% of payroll. The actuarially determined contribution is equal to the Plan's employer normal cost, plus the amount necessary to amortize the actuarial shortfall as of June 30, 2017 over a period ending on June 30, 2038, assuming that the amortization period will remain closed and that the amortization amount will increase annually at the rate of 5% over the preceding year.
5. The 5% factor by which amortization payments are scheduled to increase is assumed to change to 3% beginning July 1, 2019. While not in statute, this mirrors the change scheduled to occur in the other Vermont systems. This means that, initially, the contribution requirements beginning with the fiscal year ending June 30, 2020 and for several years thereafter will be significantly greater than the requirement for the year ending June 30, 2019.
6. The average funding policy contribution rate is 5.56%. Compared to the actuarially determined contribution rate of 5.22%, there is a contribution rate excess of 0.34% in aggregate. By group, Groups A, B and D have a contribution sufficiency and Group C has a contribution deficiency. Details can be found in *Section 2, Exhibit F*.
7. The actuarial loss from investment experience is \$4,994,810.
8. The net experience gain from sources other than investment experience was approximately 1.0% of the actuarial accrued liability prior to the reflection of assumption changes.

9. The rate of return on the market value of assets was 11.1% for the July 1, 2016 to June 30, 2017 plan year. The return on the actuarial value of assets was 7.1% for the same period due to the recognition of prior year's investment gains and losses. This resulted in an actuarial loss when measured against the assumed rate of return of 7.95% (applicable for the year ending June 30, 2017). Given the low fixed income interest rate environment, target asset allocation and expectations of future investment returns for various classes, the Board lowered the investment return assumption to 7.50% effective for this June 30, 2017 actuarial valuation. We advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments.
10. The actuarial value of assets is 102.5% of the market value of assets. The investment experience in the past years has only been partially recognized in the actuarial value of assets. As the deferred net loss is recognized in future years, the actuarially-determined cost of the Plan is likely to increase unless the net loss is offset by future experience. The recognition of the deferred market losses of \$15,180,151 will also have an impact on the future funded ratio. If the net deferred losses were recognized immediately in the actuarial value of assets, the actuarially determined contribution would increase from 5.22% to about 5.55% of payroll.
11. The following changes in actuarial assumptions were approved by the Board:
  - The investment return assumption was lowered from 7.95% to 7.50%.
  - The inflation assumption was lowered from 3.00% to 2.50%.
  - The COLA assumption was lowered from 1.50% to 1.15% for Group A members and from 1.80% to 1.30% for Groups B, C, and D members.
  - The mortality assumption was updated, as outlined in *Section 4, Exhibit I*.

As a result of these assumption changes, the total normal contribution rate increased by 0.53% and the Plan's actuarial shortfall increased by \$18,333,436. The total impact was an increase in the actuarially determined contribution of \$2,249,317 or 0.78% of payroll.

12. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the Plan's funding policy and measuring the progress of that funding policy. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68, for inclusion in the plan and employer's financial statements as of June 30, 2017, and June 30, 2018, will be provided separately. The actuarially determined contribution in this valuation is expected to be used as the actuarially determined contribution (ADC) for GASB financial reporting.
13. This actuarial report as of June 30, 2017, is based on financial and demographic data as of that date. Changes subsequent to that date are not reflected and will affect future actuarial costs of the Plan.

## Summary of Key Valuation Results

		2017	2016*
<b>Contributions for plan year beginning July 1:</b>	• Funding policy contribution rate	5.56%	5.56%
	• Actuarially determined employer contributions as a percent of payroll	5.22%	4.64%
	• Contribution rate excess/(shortfall)	0.34%	0.92%
<b>Actuarial cost method measures for plan year beginning July 1:</b>	• Actuarial shortfall to be amortized through June 30, 2038	\$178,356,608	\$163,348,923
	• Normal contribution rates for plan year beginning July 1		
	– Employee normal contribution rate	5.38%	5.38%
	– Employer normal contribution rate	1.40%	0.87%
	– Total normal contribution rate	6.78%	6.25%
<b>Actuarial accrued liability (EAN) for plan year beginning July 1**:</b>	• Total actuarial accrued liability	\$754,876,508	\$672,238,343
	• Employer normal cost dollars	13,964,241	N/A
	• Employer normal cost rate	4.84%	N/A
<b>Assets for plan year beginning July 1:</b>	• Market value of assets (MVA)	\$619,510,342	\$547,015,114
	• Actuarial value of assets (AVA)	634,690,493	581,611,235
	• Actuarial value of assets as a percentage of market value of assets	102.45%	106.32%
<b>Funded status (EAN) for plan year beginning July 1:</b>	• Unfunded actuarial accrued liability based on MVA	\$135,366,166	\$125,223,229
	• Funded percentage on MVA basis	82.07%	81.37%
	• Unfunded actuarial accrued liability based on AVA	\$120,186,015	\$90,627,108
	• Funded percentage on AVA basis	84.08%	86.52%
	• Remaining amortization period	21	22
<b>Key assumptions:</b>	• Interest rate	7.50%	7.95%
	• Inflation rate	2.50%	3.00%
<b>Demographic data for plan year beginning July 1:</b>	• Number of retired members and beneficiaries	2,942	2,734
	• Number of vested former members	797	811
	• Number of inactive members entitled to a refund of employee contributions	2,221	2,099
	• Number of active members	7,302	6,966
	• Total payroll	\$274,813,707	\$256,730,055
	• Average payroll	37,635	36,855

\* All valuation results shown throughout this report for June 30, 2016, and prior years were calculated by the prior actuary, Buck Consultants.

\*\* Entry Age Normal liability and normal cost is shown for informational purposes only. The actuarial cost method used by the System is described in Section 4, Exhibit 1.

## Summary of Key July 1, 2017, Valuation Results by Group

	Group A	Group B	Group C	Group D	Total
<b>Contributions:</b>					
• Current funding policy rate	4.000%	5.500%	7.250%	9.850%	5.562%
• Actuarially determined rate	3.271%	5.381%	7.290%	7.731%	5.221%
• Excess/(shortfall)	0.729%	0.119%	-0.040%	2.119%	0.341%
<b>Actuarial cost method measures:</b>					
• Actuarial shortfall	36,262,325	91,942,536	39,479,367	10,672,381	178,356,608
• Normal contribution rates					
– Employee rate	2.500%	4.875%	10.000%	11.350%	5.380%
– Employer rate	0.512%	1.436%	2.576%	1.911%	1.399%
– Total rate	3.012%	6.311%	12.576%	13.261%	6.779%
<b>Actuarial accrued liability (EAN):</b>					
• Total actuarial accrued liability	\$166,925,811	\$380,445,303	\$168,102,363	\$39,403,031	\$754,876,508
• Employer normal cost dollars	3,293,174	7,424,810	2,731,571	514,685	13,964,241
• Employer normal cost rate	4.051%	5.151%	5.274%	4.539%	4.839%
<b>Assets:</b>					
• Market value of assets (MVA)	\$145,682,393	\$314,476,075	\$130,287,274	\$29,064,601	\$619,510,342
• Actuarial value of assets (AVA)	149,252,116	322,182,829	133,479,763	29,776,785	634,690,493
<b>Funded status (EAN):</b>					
• Unfunded liability on MVA basis	21,243,418	65,969,228	37,815,089	10,338,430	135,366,166
• Funded percentage on MVA basis	87.27%	82.66%	77.50%	73.76%	82.07%
• Unfunded liability on AVA basis	17,673,695	58,263,474	34,622,600	9,626,246	120,186,015
• Funded percentage on AVA basis	89.41%	84.69%	79.40%	75.57%	84.08%
<b>Demographic data:</b>					
• Retired members and beneficiaries	1,158	1,410	338	36	2,942
• Vested former members	449	315	27	6	797
• Inactive members entitled to a refund of employee contributions	1,158	962	88	13	2,221
• Active members	2,701	3,583	857	161	7,302
• Total payroll	\$77,415,109	\$137,274,426	\$49,324,084	\$10,800,088	\$274,813,707
• Average payroll	28,662	38,313	57,554	67,081	37,635

## 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:

<b>Plan of benefits</b>	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.
<b>Membership data</b>	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.
<b>Assets</b>	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.
<b>Actuarial assumptions</b>	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 System and Board of Trustees. 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.
- Actuarial results in this report 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 its other advisors for expertise in these areas.

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

## Section 2: Actuarial Valuation Results

### A. Membership Data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active members, inactive members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A and B*.

#### MEMBER POPULATION: 2008 – 2017

As of July 1	Active Members	Vested Terminated Members*	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives
2008	6,419	486	1,447	1,933	0.30
2009	6,533	554	1,538	2,092	0.32
2010	6,605	585	1,644	2,229	0.34
2011	6,475	645	1,779	2,424	0.37
2012	6,606	623	1,991	2,614	0.40
2013	6,577	652	2,146	2,798	0.43
2014	6,664	692	2,359	3,051	0.46
2015	6,685	837	2,539	3,376	0.51
2016	6,966	811	2,734	3,545	0.51
2017	7,302	797	2,942	3,739	0.51

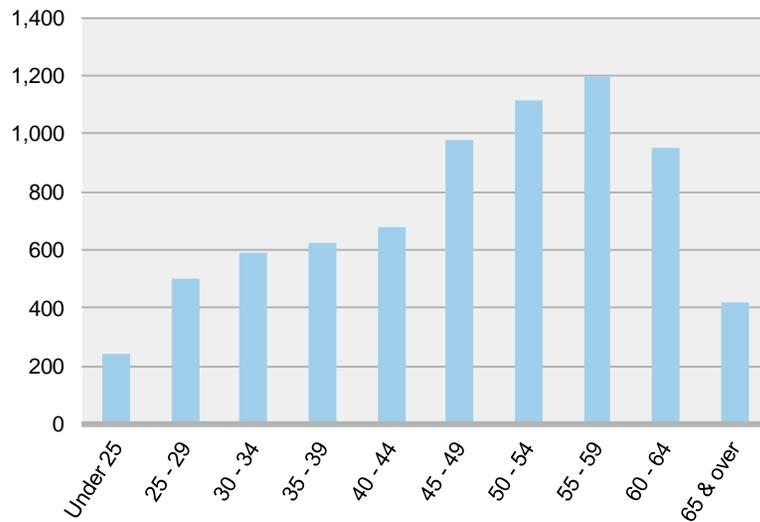
\*Excludes terminated participants due a refund of employee contributions

## Active Members

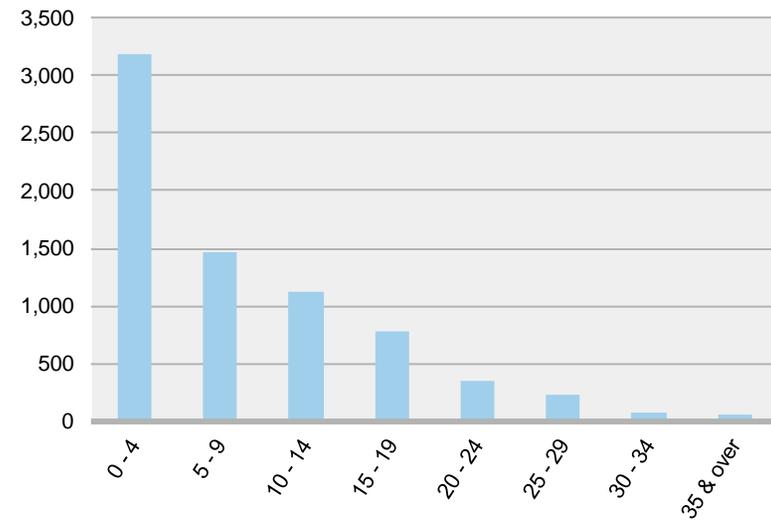
Plan costs are affected by the age, years of creditable service and payroll of active members. In this year's valuation, there were 7,302 active members with an average age of 48.4, average years of creditable service of 8.8 years and average payroll of \$37,635. The 6,966 active members in the prior valuation had an average age of 48.5, average service of 9.0 years and average payroll of \$36,855.

### Distribution of Active Members as of July 1, 2017

#### ACTIVES BY AGE



#### ACTIVES BY YEARS OF CREDITABLE SERVICE



## Inactive Members

In this year's valuation, there were 797 members with a vested right to a deferred or immediate vested benefit.

In addition, there were 2,221 non-vested members entitled to a return of their employee contributions.

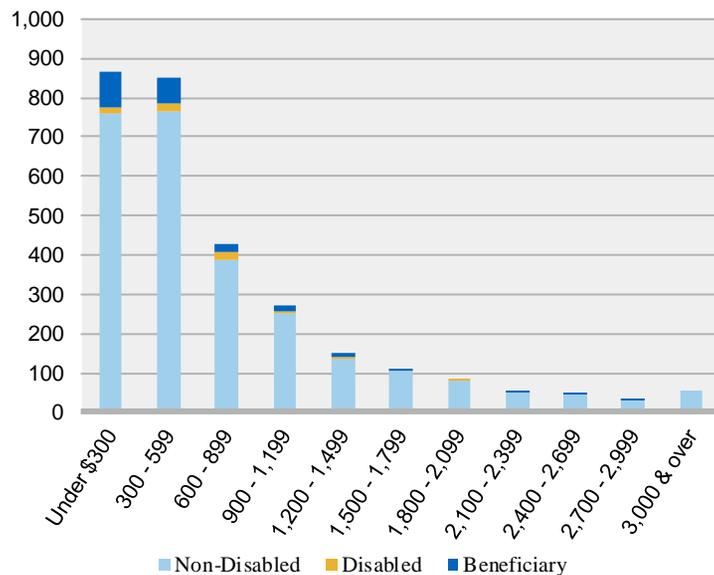
## Retired Members and Beneficiaries

As of July 1, 2017, 2,731 retired members (including disability retirees) and 211 beneficiaries were receiving total monthly benefits of \$2,246,997. For comparison, in the previous valuation, there were 2,523 retired members and 211 beneficiaries receiving monthly benefits of \$1,959,123.

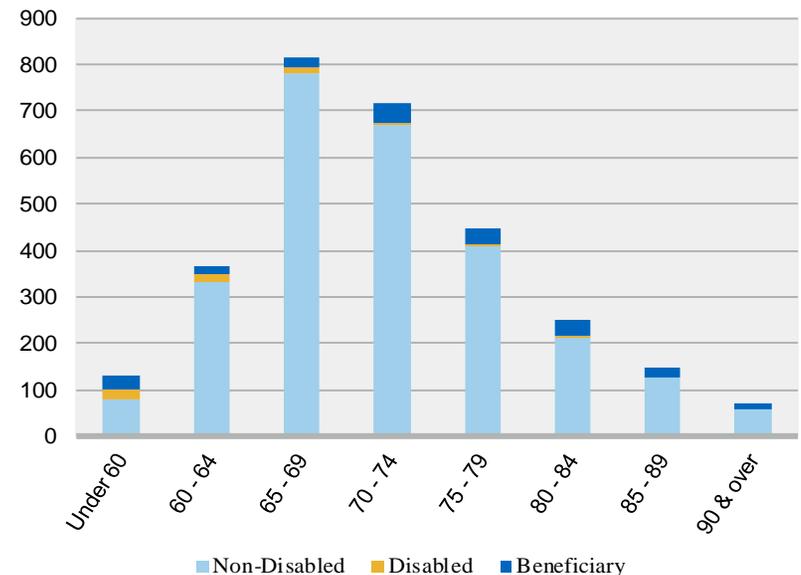
As of July 1, 2017, the average monthly benefit for retired members is \$773, compared to \$738 in the previous valuation. The average age for retired members is 71.4 in the current valuation, compared with 71.4 in the prior valuation.

### Distribution of Pensioners as of July 1, 2017

**PENSIONERS BY TYPE AND MONTHLY AMOUNT**



**PENSIONERS BY TYPE AND BY AGE**



## Historical Plan Population

The chart below demonstrates the progression of the active population over the last ten years. The chart also shows the growth among the retired population over the same time period.

### MEMBERSHIP DATA STATISTICS: 2008 – 2017

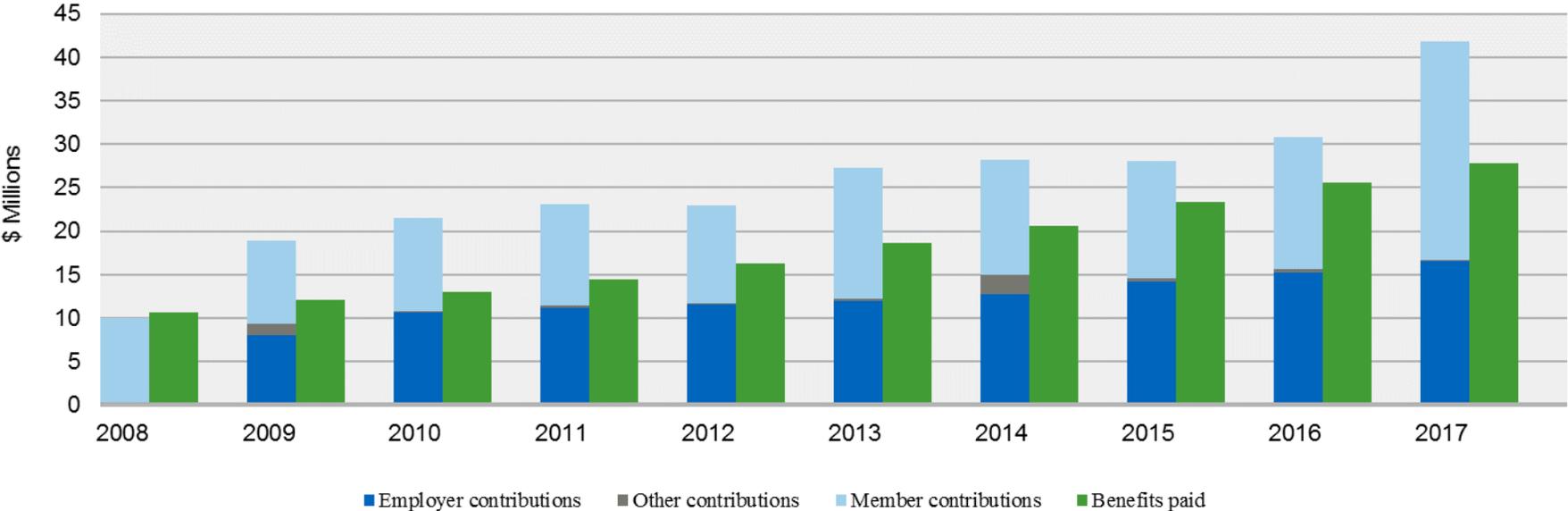
As of July 1	Active Members			Retired Members		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2008	6,419	47.3	7.0	1,308	--	\$534
2009	6,533	47.8	7.3	1,390	--	569
2010	6,605	48.1	7.8	1,492	--	554
2011	6,475	48.5	8.1	1,620	--	598
2012	6,606	48.5	8.9	1,826	--	634
2013	6,577	48.8	9.1	1,982	--	659
2014	6,664	48.9	9.1	2,177	71.2	693
2015	6,685	48.7	9.1	2,329	71.3	718
2016	6,966	48.5	9.0	2,523	71.4	738
2017	7,302	48.4	8.8	2,731	71.4	773

## B. Financial Information

Retirement plan funding anticipates that, over the long term, both contributions and investment earnings (less investment fees and administrative expenses) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of these transactions for the valuation year, is presented in *Section 3, Exhibits C, D and E*.

**COMPARISON OF CONTRIBUTIONS TO BENEFITS PAID  
FOR YEARS ENDED JUNE 30, 2008 – 2017**



It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has adopted an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuation is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The asset method provides a degree of conservatism to increase the likelihood that benefits are funded. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

### DETERMINATION OF ACTUARIAL VALUE OF ASSETS FOR YEAR ENDED JUNE 30, 2017

1	Market value of assets, June 30, 2017			\$619,510,342
2	Calculation of unrecognized return	Original Amount *	Percent Deferred	Unrecognized Amount**
	(a) Year ended June 30, 2017	\$17,171,553	80%	\$13,737,242
	(b) Year ended June 30, 2016	-35,999,708	60%	-21,599,826
	(c) Year ended June 30, 2015	-35,883,134	40%	-14,353,254
	(d) Year ended June 30, 2014	35,178,435	20%	<u>7,035,687</u>
	(e) Total unrecognized return			-15,180,151
3	Preliminary actuarial value: 1 - 2e			\$634,690,493
4	Adjustment to be within 20% corridor			0
5	Final actuarial value of assets as of June 30, 2017: 3 + 4			\$634,690,493
6	Actuarial value as a percentage of market value: 5 ÷ 1			102.5%
7	Amount deferred for future recognition: 1 - 5			-\$15,180,151

\*Total return minus expected return on a market value basis

\*\*Recognition at 20% per year over five years

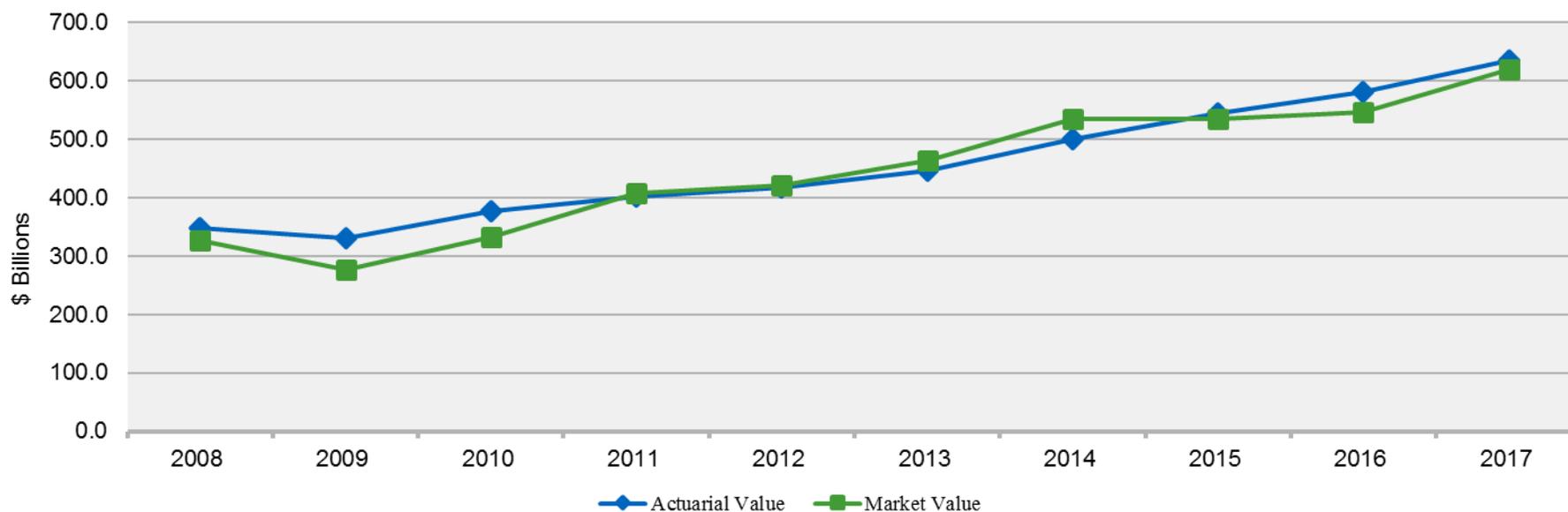
The following table presents an allocation of total valuation assets to each participant group. The amounts shown for reallocation of surplus for members transferring among groups were derived by estimation of the contributions made on behalf of these members in their prior groups and accumulation of these amounts with interest at the historical rates of return calculated for the System.

### ALLOCATION OF ACTUARIAL VALUE OF ASSETS AS OF JUNE 30, 2017

	Group A	Group B	Group C	Group D	Total
Valuation assets as of July 1, 2016	\$141,164,014	\$293,704,206	\$120,650,575	\$26,092,440	\$581,611,235
Contributions	5,451,914	22,606,069	10,660,964	2,973,346	41,692,294
Income	9,969,956	21,111,688	8,698,814	1,915,317	41,695,777
Benefit payments	-6,122,976	-13,626,576	-6,229,795	-1,055,197	-27,034,544
Expenses	-644,395	-1,340,721	-550,754	-119,109	-2,654,979
Net transfers	-150,309	-312,731	-128,467	-27,783	-619,290
Surplus reallocation for transferring participants	-416,088	39,893	378,426	-2,231	0
Valuation assets as of June 30, 2017	\$149,252,116	\$322,181,829	\$133,479,763	\$29,776,785	\$634,690,493

Both the actuarial value and market value of assets are representations of the Plan’s financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Plan’s liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

### ACTUARIAL VALUE OF ASSETS VS. MARKET VALUE OF ASSETS AS OF JUNE 30, 2008 – 2017



## C. Actuarial Experience

To calculate the actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The net experience gain is \$2,218,971, which includes \$4,994,810 from investment losses and \$7,213,781 in gains from all other sources. The net experience variation from individual sources other than investments was 1.0% of the actuarial accrued liability prior to the reflection of assumption changes. A discussion of the major components of the actuarial experience is on the following pages.

### ACTUARIAL EXPERIENCE FOR YEAR ENDED JUNE 30, 2017

1	Net gain/(loss) from investments*	-\$4,994,810
2	Net gain/(loss) from other experience	7,213,781
3	Net experience gain/(loss): 1 + 2	\$2,218,971

\* Details on next page.

## Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the System's investment policy. The rate of return on the market value of assets was 11.06% for the year ended June 30, 2017.

For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.95% (changed to 7.50%, effective June 30, 2017). The actual rate of return on an actuarial basis for the 2017 plan year was 7.10%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended June 30, 2017 with regard to its investments.

### INVESTMENT EXPERIENCE

	Year Ended June 30, 2017	
	Market Value	Actuarial Value
1 Investment income	\$61,111,748	\$41,695,777
2 Average value of assets	552,706,854	587,302,976
3 Rate of return: $1 \div 2$	11.06%	7.10%
4 Assumed rate of return	7.95%	7.95%
5 Expected investment income: $2 \times 4$	\$43,940,195	\$46,690,587
6 Actuarial gain/(loss): $1 - 5$	<u>\$17,171,553</u>	<u>-\$4,994,810</u>

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The table below shows the rate of return on an actuarial basis compared to the market value investment return for the last 20 years, including averages over select time periods.

### INVESTMENT RETURN – ACTUARIAL VALUE VS. MARKET VALUE: 1998 - 2017

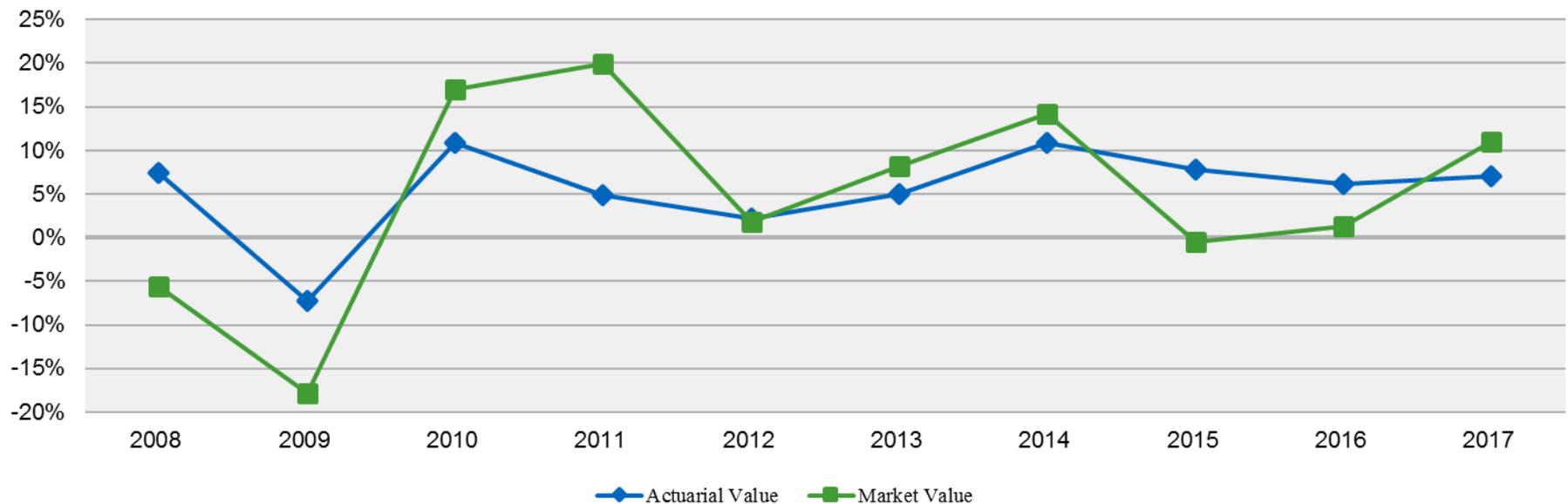
Year Ended June 30	Actuarial Value Investment Return		Market Value Investment Return		Year Ended June 30	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
1998	\$16,462,282	17.02%	\$23,739,951	21.51%	2008	\$24,090,810	7.41%	-\$19,625,280	-5.65%
1999	19,974,567	17.28	19,833,679	14.53	2009	-25,653,211	-7.27	-59,207,777	-17.88
2000	19,323,381	13.80	8,347,167	5.19	2010	36,633,414	10.92	47,603,471	16.99
2001	16,228,833	10.03	282,793	0.16	2011	18,319,813	4.82	66,935,648	19.93
2002	11,545,636	6.42	-3,094,678	-1.78	2012	8,922,492	2.20	7,667,705	1.87
2003	7,138,256	3.49	2,449,864	1.33	2013	20,983,866	4.98	34,837,755	8.21
2004	2,420,328*	1.07	27,853,903	13.84	2014	48,812,262	10.87	65,829,312	14.13
2005	18,398,538	7.77	17,789,133	7.51	2015	38,990,631	7.76	-2,841,341	-0.53
2006	22,173,822	8.44	27,735,589	10.59	2016	33,518,944	6.14	6,787,237	1.26
2007	29,551,551	10.11	46,635,359	15.69	2017	41,695,777	7.10	61,111,748	11.06
							Most recent five-year average return	7.34%	6.58%
							Most recent ten-year average return	5.72%	4.95%
							Most recent 15-year average return	5.90%	6.14%
							Most recent 20-year average return	6.58%	6.18%

Note: Each year's yield is weighted by the average asset value in that year.

\* Includes restart of AVA method (reset to MVA).

Subsection B described the actuarial asset valuation method that gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

### MARKET AND ACTUARIAL RATES OF RETURN FOR YEARS ENDED JUNE 30, 2008 - 2017



## Administrative Expenses

Administrative expenses for the year ended June 30, 2017 totaled \$1,030,159 compared to \$890,802 the prior year. There is currently no explicit provision for administrative expenses.

## Contributions

Contributions for the year ended June 30, 2017 totaled \$41,841,850 compared to the projected amount of \$30,420,774. This resulted in a gain of \$11,875,064 for the year. However, this includes approximately \$9,000,000 of purchased service; the additional liability for this purchased service is an offsetting demographic loss.

## Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected),
- actual COLAs paid (more or less than assumed), and
- salary increases (greater or smaller than projected).

The net gain from this other experience for the year ended June 30, 2017 amounted to \$7,213,781.

### EXPERIENCE GAIN/(LOSS) DUE TO CHANGES IN DEMOGRAPHICS FOR YEAR ENDED JUNE 30, 2017

Net turnover	-\$5,395,268
Retirement	-4,220,058
Deaths among retired members and beneficiaries	1,936,827
Disability retirements	-129,780
Salary increases less than expected for continuing actives	1,450,748
COLA experience	2,405,635
Miscellaneous	11,165,677
<b>Total</b>	<b>\$7,213,781</b>

## D. Changes in the Actuarial Accrued Liability

The actuarial accrued liability under the Entry Age Normal cost method as of June 30, 2017 is \$754,876,508, an increase of \$82,638,165, or 12.3%, from the actuarial accrued liability as of the prior valuation date. The Entry Age Normal liability is provided for informational purposes only. The actuarial cost method used by the System is described in *Section 4, Exhibit I*.

### Actuarial Assumptions

- The assumption changes reflected in this report are:
  - The investment return assumption was lowered from 7.95% to 7.50%.
  - The inflation assumption was lowered from 3.00% to 2.50%.
  - The COLA assumption was lowered from 1.50% to 1.15% for Group A members and from 1.80% to 1.30% for Groups B, C and D members.
  - The mortality assumption for healthy participants was updated as follows:
    - Groups A, B and C – 98% of the RP-2014 tables, blended 60% Blue Collar and 40% Healthy, with generational projection using Scale SSA-2017;
    - Group D – 100% of the RP-2014 Blue Collar tables with generational projection using Scale SSA-2017.
  - The mortality assumption for disability retirees was updated to the RP-2014 Disabled Mortality Table with generational projection using Scale SSA-2017.
- These changes increased the actuarial accrued liability by 2.2% and increased the total normal cost by 5.4%.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

### Plan Provisions

- There were no changes in plan provisions since the prior valuation.
- A summary of plan provisions is in *Section 4, Exhibit II*.

## E. Reconciliation of Actuarial Shortfall

### RECONCILIATION OF ACTUARIAL SHORTFALL FOR YEAR ENDED JUNE 30, 2017 BASED ON CURRENT FUNDING METHOD

1	Actuarial shortfall at beginning of year		\$163,348,926
2	Normal cost at beginning of year		27,245,986
3	Total contributions		-41,841,850
4	Interest		
	• For whole year on 1 + 2	\$16,815,509	
	• For half year on 3	<u>-1,663,214</u>	
	Total interest		<u>15,152,295</u>
5	Expected actuarial shortfall		\$162,242,143
6	Changes due to:		
	• (Gain)/loss	-2,218,971	
	• Assumptions	18,333,436	
	• Funding method	0	
	• Plan provisions	<u>0</u>	
	Total changes		<u>\$16,114,465</u>
7	Actuarial shortfall at end of year		<u>\$178,356,608</u>

## F. Actuarially Determined Contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. As of July 1, 2017, the actuarially determined contribution is \$15,066,601, or 5.22% of payroll.

The statute governing the System specifies the funding policy used to calculate the actuarially determined contribution based on a closed amortization period ending on June 30, 2038. As of July 1, 2017, there are 21 years remaining on this schedule.

The contribution requirement as of July 1, 2017 is based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

### ACTUARIALLY DETERMINED CONTRIBUTION

		Year Beginning July 1	
		2017	
		Amount	% of Payroll
1	Present value of future benefits	\$970,860,203	
2	Actuarial value of assets	<u>-634,690,493</u>	
3	Total present value of future contributions: 1 - 2	\$336,169,710	
4	Present value of future member contributions	<u>125,366,979</u>	
5	Present value of future employer contributions: 3 - 4	\$210,802,731	
6	Present value of future employer normal contributions	<u>32,446,123</u>	
7	Actuarial shortfall to be amortized: 5 - 6	<u>\$178,356,608</u>	
8	Total normal cost, adjusted for timing*	\$19,561,846	6.78%
9	Projected member contributions	<u>15,525,011</u>	<u>5.38%</u>
10	Employer normal cost: 8 - 9	\$4,036,835	1.40%
11	Payment on actuarial shortfall, adjusted for timing*	<u>11,029,766</u>	<u>3.82%</u>
12	Total recommended employer contribution: 10 + 11	<u>\$15,066,601</u>	<u>5.22%</u>
13	Projected payroll for the upcoming fiscal year	\$288,554,392	

\*Actuarially determined contributions are assumed to be paid at the middle of the year.

## Actuarially Determined Contribution by Group

The following table shows a comparison of the Actuarially Determined Contribution to the current funding policy rates, by group.

### ACTUARIALLY DETERMINED CONTRIBUTION BY GROUP

	Group A	Group B	Group C	Group D	Total
1. Normal contributions					
a. Member	2.500%	4.875%	10.000%	11.350%	5.380%
b. Employer	<u>0.512%</u>	<u>1.436%</u>	<u>2.576%</u>	<u>1.911%</u>	<u>1.399%</u>
c. Total	3.012%	6.311%	12.576%	13.261%	6.779%
2. Payment on actuarial shortfall through June 30, 2038	2.759%	3.945%	4.714%	5.820%	3.822%
3. Actuarially determined contribution: 1b + 2	3.271%	5.381%	7.290%	7.731%	5.221%
4. Current funding policy contribution rate	4.000%	5.500%	7.250%	9.850%	5.562%
5. Contribution excess/(sufficiency): 4 - 3	0.729%	0.119%	-0.040%	2.119%	0.341%

We recommend that the Board set future contribution rates between the rates specified in items 3 and 4 in the table above. We note that, as discussed in the highlights, the 5% factor by which amortization payments are scheduled to increase is set to change to 3% beginning July 1, 2019. While not in statute, this mirrors the change scheduled to occur in the other Vermont systems. This means that, initially, the contribution requirements beginning with the fiscal year ending June 30, 2020 and for several years thereafter will be significantly greater than the requirement for the year ending June 30, 2019. These increased requirements should be considered when setting future contribution rates.

The difference between the current funding policy rates and the actuarially determined contribution rate is 0.341% of payroll in the aggregate. Projected payroll for fiscal 2018 is \$288,554,392. The product of 0.341% and the projected payroll, or \$983,970, is slightly less than the non-investment expenses incurred by the System in fiscal year 2017 of \$1,030,159.

## G. Amortization Schedule for Actuarial Shortfall

A schedule of projected future actuarial shortfall payments is shown below.

### ACTUARIAL SHORTFALL AMORTIZATION SCHEDULE

As of June 30	Balance	Amortization Payment (Year Following)
2017	\$178,356,608	\$11,029,766
2018	180,297,450	11,581,254
2019	181,812,059	14,186,243*
2020	180,739,354	14,611,830
2021	179,144,937	15,050,185
2022	176,976,444	15,501,691
2023	174,177,182	15,966,741
2024	170,685,801	16,445,744
2025	166,435,926	16,939,116
2026	161,355,771	17,447,289
2027	155,367,720	17,970,708
2028	148,387,872	18,509,829
2029	140,325,563	19,065,124
2030	131,082,839	19,637,078
2031	120,553,896	20,226,190
2032	108,624,478	20,832,976
2033	95,171,224	21,457,965
2034	80,060,974	22,101,704
2035	63,150,013	22,764,755
2036	44,283,263	23,447,698
2037	23,293,417	24,151,129
2038	0	0

\* Beginning July 1, 2019 and each year thereafter, mirroring the change set to occur in the other Vermont systems, the annual payment to amortize the actuarial shortfall will be calculated based upon installments increasing at a rate of 3% per year instead of 5%.

## H. History of Employer Contributions

A history of the most recent years of contributions is shown below.

### HISTORY OF EMPLOYER CONTRIBUTIONS: 2009 – 2018

Fiscal Year Ended June 30	Actuarially Determined Employer Contribution		Actual Employer Contribution		Percent Contributed
	Amount	Percentage of Payroll*	Amount	Percentage of Payroll*	
2009	\$5,572,339	3.00%	\$8,008,862	4.31%	143.73%
2010	8,124,338	4.04%	10,592,919	5.27%	130.39%
2011	8,415,993	3.96%	11,117,363	5.23%	132.10%
2012	8,224,579	3.81%	11,532,230	5.34%	140.22%
2013	10,704,263	4.74%	12,014,186	5.32%	112.24%
2014	11,638,928	5.03%	12,805,737	5.53%	110.03%
2015	11,956,121	4.93%	14,136,067	5.83%	118.23%
2016**	15,235,742	N/A	15,235,742	N/A	100.00%
2017	12,895,672	4.64%	16,481,881	5.56%	127.81%
2018	15,066,601	5.22%	--	--	--

\*Based on expected payroll

\*\*While no formal actuarial valuation was produced for the fiscal year ended June 30, 2015, contribution rates for the year were developed by the actuary.

## I. Actuarial Balance Sheet

An overview of the Plan’s funding is provided by an Actuarial Balance Sheet, which compares the total liabilities (current and future) to the total assets (current and future). The liabilities are calculated by determining the amount and timing of all future payments that will be made by the Plan for current participants. These payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value of all benefits, referred to as the “liability” of the Plan.

Second, this liability is compared to the assets. The “assets” for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer normal cost contributions, and the present value of future employer amortization payments for the unfunded actuarial accrued liability.

### ACTUARIAL BALANCE SHEET

	Year Ended	
	June 30, 2017	June 30, 2016
<b>Liabilities</b>		
• Present value of benefits for retired participants and beneficiaries	\$286,934,411	\$258,136,079
• Present value of benefits for inactive former participants	47,985,334	44,768,299
• Present value of benefits for active participants	<u>635,940,458</u>	<u>551,827,350</u>
<b>Total liabilities</b>	<b>\$970,860,203</b>	<b>\$854,731,728</b>
<b>Assets</b>		
• Total valuation value of assets	\$634,690,493	\$581,611,235
• Present value of future contributions by members	125,366,979	94,436,680
• Present value of future employer contributions for:		
» Employer normal contributions	32,446,123	15,334,890
» Actuarial shortfall	<u>178,356,608</u>	<u>163,348,923</u>
<b>Total of current and future assets</b>	<b><u>\$970,860,203</u></b>	<b><u>\$854,731,728</u></b>

## Section 3: Supplemental Information

### EXHIBIT A – TABLE OF PLAN COVERAGE

Category	As of July 1		Change From Prior Year
	2017	2016	
<b>Active members in valuation:</b>			
• Number	7,302	6,966	4.8%
• Average age	48.4	48.5	-0.1
• Average years of creditable service	8.8	9.0	-0.2
• Total payroll	\$274,813,707	\$256,730,055	7.0%
• Average payroll	37,635	36,855	2.1%
• Total active vested members	4,113	4,073	1.0%
<b>Inactive members:</b>			
• Number of terminated vested	797	810	-1.6%
• Number of other non-vested inactives	2,221	2,099	5.4%
<b>Beneficiaries with rights to a deferred benefit</b>	0	1	-100.0%
<b>Retired members:</b>			
• Number in pay status	2,664	2,465	8.1%
• Average age	71.3	71.6	-0.3
• Average monthly benefit	\$773	\$742	4.2%
<b>Disability Retirees:</b>			
• Number in pay status	67	58	15.5%
• Average age	63.4	64.3	-0.9
• Average monthly benefit	\$661	\$605	9.3%
<b>Beneficiaries:</b>			
• Number in pay status	211	211	0.0%
• Average age	73.1	71.8	1.3
• Average monthly benefit	\$478	\$463	3.2%

\*In 2017, QDROs were included in the retired participant counts rather than the beneficiary counts.

## EXHIBIT B – RECONCILIATION OF MEMBERSHIP DATA

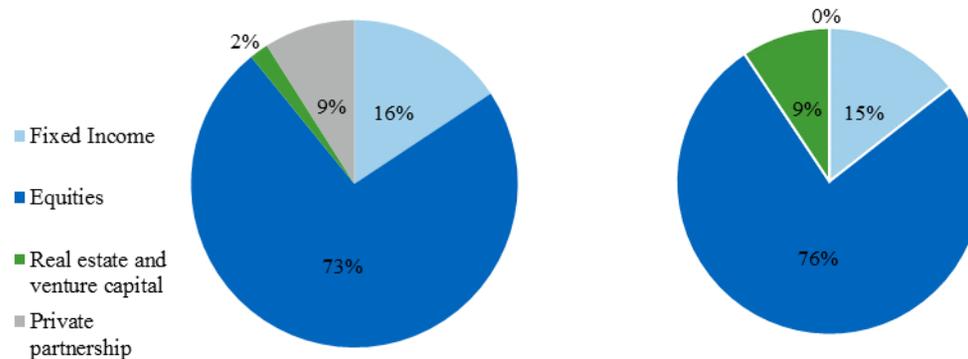
	Active Members	Vested Terminated Members	Non- vested Members	Disability Retirees	Retired Members	Beneficiaries	Total
<b>Number as of July 1, 2016</b>	<b>6,966</b>	<b>811</b>	<b>2,099</b>	<b>58</b>	<b>2,465</b>	<b>211</b>	<b>12,610</b>
• New participants	1,087	N/A	197	N/A	N/A	N/A	1,284
• Terminations – with vested rights	0	0	0	0	0	0	0
• Terminations – without vested rights	-597	N/A	597	N/A	N/A	N/A	0
• Retirements	-190	-43	-24	N/A	257	N/A	0
• New disabilities	-6	0	-2	13	-5	N/A	0
• Return to work	0	0	0	0	0	N/A	0
• Died with beneficiary	-2	0	0	0	-19	21	0
• Died without beneficiary	-5	-3	-2	-2	-52	-8	-72
• Lump sum cash-outs	-98	-14	-450	0	-1	0	-563
• Rehire	147	-11	-136	N/A	0	N/A	0
• Certain period expired	N/A	N/A	0	0	0	-1	-1
• Data adjustments	0	57	-58	-2	19	-12	4
<b>Number as of July 1, 2017</b>	<b>7,302</b>	<b>797</b>	<b>2,221</b>	<b>67</b>	<b>2,664</b>	<b>211</b>	<b>13,262</b>

## EXHIBIT C – SUMMARY STATEMENT OF INCOME AND EXPENSES ON A MARKET VALUE BASIS

	Year Ended June 30, 2017	Year Ended June 30, 2016
Net assets at market value at the beginning of the year	\$547,015,113	\$535,903,742
<b>Contribution income:</b>		
• Employer contributions	\$16,481,881	\$15,235,742
• Member contributions	25,210,413	15,226,948
• Less administrative expenses	<u>-1,030,159</u>	<u>-890,802</u>
<i>Net contribution income</i>	\$40,662,135	\$29,571,888
Net other income	\$149,556	\$351,434
<b>Investment income:</b>		
• Interest, dividends and other income	\$9,168,650	\$5,340,299
• Asset appreciation	51,943,098	25,231,184
• Income from pooled investments	0	-22,261,017
• Less investment fees	<u>-1,624,820</u>	<u>-1,533,533</u>
<i>Net investment income</i>	<u>\$59,486,928</u>	<u>\$6,776,933</u>
<b>Total income available for benefits</b>	<b>\$100,298,619</b>	<b>\$36,700,255</b>
<b>Less benefit payments:</b>		
• Benefits	-\$24,915,886	-\$22,912,363
• Refunds of contributions	-1,858,831	-1,704,609
• Death claims	-259,827	-303,236
• Transfers to other pension trust funds	<u>-768,846</u>	<u>-668,676</u>
<i>Net benefit payments</i>	-\$27,803,390	-\$25,588,884
<b>Change in reserve for future benefits</b>	<b>\$72,495,229</b>	<b>\$11,111,371</b>
<b>Net assets at market value at the end of the year</b>	<b>\$619,510,342</b>	<b>\$547,015,113</b>

## EXHIBIT D – SUMMARY STATEMENT OF PLAN ASSETS

	June 30 , 2017	June 30, 2016
Cash equivalents	\$17,975,440	\$7,476,917
Total accounts receivable	45,215,227	28,673,917
Prepaid expenses	21,000	20,422
Capital assets, net of depreciation	796,487	950,782
<b>Investments:</b>		
• Fixed Income	\$94,195,542	\$77,520,255
• Equities	115,460,190	91,501,085
• Private partnership	53,911,454	0
• Mutual and commingled funds	324,479,956	317,975,738
• Real estate and venture capital	<u>11,298,712</u>	<u>50,306,157</u>
Total investments at market value	\$599,345,854	\$537,303,235
Total assets	\$663,354,008	\$574,425,273
Total liabilities	-43,843,666	-27,410,160
<b>Net assets at market value</b>	<b>\$619,510,342</b>	<b>\$547,015,113</b>
<b>Net assets at actuarial value</b>	<b>\$634,690,493</b>	<b>\$581,611,235</b>



## EXHIBIT E – DEVELOPMENT OF THE FUND THROUGH JUNE 30, 2017

Year Ended June 30	Employer Contributions	Member Contributions	Net Other Income	Net Investment Return*	Admin. Expenses**	Benefit Payments***	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2007							\$276,172,429	\$331,406,915	120.00%
2008	\$0	\$9,906,709	\$124,132	-\$19,472,654	-\$623,619	-\$10,714,939	327,060,102	348,740,022	106.63%
2009	8,008,862	9,557,973	1,321,919	-56,937,342	-798,458	-12,040,627	276,172,429	331,406,915	120.00%
2010	10,592,919	10,711,600	203,549	47,598,096	-393,947	-12,996,194	331,888,452	376,152,881	113.34%
2011	11,117,363	11,702,728	266,425	66,957,781	-569,603	-14,461,590	406,901,556	402,550,150	98.93%
2012	11,532,230	11,337,926	118,191	7,661,464	-672,851	-16,338,446	420,540,070	417,443,451	99.26%
2013	12,014,186	15,060,665	170,381	34,838,507	-749,447	-18,687,932	463,186,430	446,235,922	96.34%
2014	12,805,737	13,233,728	2,142,868	64,346,116	-588,022	-20,601,380	534,525,477	500,557,919	93.65%
2015	14,136,067	13,587,975	384,009	-2,358,518	-1,056,094	-23,315,174	535,903,742	543,768,156	101.47%
2016	15,235,742	15,226,948	351,434	6,776,933	-890,802	-25,588,884	547,015,114	581,611,235	106.32%
2017	16,481,881	25,210,413	149,556	59,486,928	-1,030,159	-27,803,390	619,510,342	634,690,493	102.45%

\* On a market basis, net of investment fees

\*\* Includes depreciation

\*\*\* Includes "transfers to other pension trust funds"

## EXHIBIT F – DEFINITION OF PENSION TERMS

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

<b>Actuarial Accrued Liability for Actives:</b>	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
<b>Actuarial Accrued Liability for Pensioners:</b>	The single-sum value of lifetime benefits to existing pensioners. This sum takes into account life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.
<b>Actuarial Cost Method:</b>	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
<b>Actuarial Gain or Loss:</b>	A measure of the difference between actual experience and expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge that may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
<b>Actuarially Equivalent:</b>	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
<b>Actuarial Present Value (APV):</b>	<p>The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:</p> <ul style="list-style-type: none"> <li>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)</li> <li>Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and</li> <li>Discounted according to an assumed rate (or rates) of return to reflect the time value of money.</li> </ul>

<b>Actuarial Present Value of Future Plan Benefits:</b>	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
<b>Actuarial Valuation:</b>	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).
<b>Actuarial Value of Assets (AVA):</b>	The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.
<b>Actuarially Determined:</b>	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
<b>Actuarially Determined Contribution (ADC):</b>	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
<b>Amortization Method:</b>	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
<b>Amortization Payment:</b>	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
<b>Assumptions or Actuarial Assumptions:</b>	The estimates upon which the cost of the Fund is calculated, including: <u>Investment return</u> - the rate of investment yield that the Fund will earn over the long-term future;

	<p><u>Mortality rates</u> - the death rates of employees and pensioners; life expectancy is based on these rates;</p> <p><u>Retirement rates</u> - the rate or probability of retirement at a given age;</p> <p><u>Withdrawal rates</u> - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;</p> <p><u>Salary increase rates</u> - the rates of salary increase due to inflation and productivity growth.</p>
<b>Closed Amortization Period:</b>	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.
<b>Decrements:</b>	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
<b>Defined Benefit Plan:</b>	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
<b>Defined Contribution Plan:</b>	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
<b>Employer Normal Cost:</b>	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
<b>Experience Study:</b>	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more Actuarial Assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
<b>Funded Ratio:</b>	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.
<b>GASB 67 and GASB 68:</b>	Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.
<b>Investment Return:</b>	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the

	fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
<b>Net Pension Liability (NPL):</b>	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
<b>Normal Cost:</b>	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
<b>Open Amortization Period:</b>	An open amortization period is one that is used to determine the Amortization Payment, but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the Actuarial Assumptions are realized.
<b>Plan Fiduciary Net Position:</b>	Market value of assets.
<b>Total Pension Liability (TPL):</b>	The actuarial accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
<b>Unfunded Actuarial Accrued Liability (UAAL):</b>	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.
<b>Valuation Date or Actuarial Valuation Date:</b>	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

## Section 4: Actuarial Valuation Basis

### EXHIBIT I – ACTUARIAL ASSUMPTIONS AND ACTUARIAL COST METHOD

<b>Rationale for Assumptions:</b>	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 July 27, 2015 (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.
<b>Inflation:</b>	2.50%.
<b>Investment Return:</b>	7.50%. 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.
<b>Salary Increases:</b>	5.00% per year.
<b>Cost-of-Living Adjustments:</b>	Assumed to occur on January 1 following one year of retirement at the rate of 1.15% per annum for Group A members and 1.30% per annum for Groups B, C and D members (beginning at Normal Retirement eligibility age for members who elect reduced early retirement, at age 62 for members of Groups A, B, and D who receive a disability retirement benefit, and at age 55 for members of Group C who receive a disability retirement benefit). The January 1, 2018 COLA is assumed to be 0.75% for all groups.
<b>Mortality Rates:</b>	<p><i>Death in Active Service:</i></p> <ul style="list-style-type: none"> <li>• Groups A/B/C 98% of RP-2014 tables, blended 60% Blue Collar Employee and 40% Healthy Employee, with generational projection using Scale SSA-2017.</li> <li>• Group D 100% of RP-2014 Blue Collar Employee with generational projection using Scale SSA-2017.</li> </ul> <p><i>Healthy Post-retirement:</i></p> <ul style="list-style-type: none"> <li>• Groups A/B/C 98% of RP-2014 tables, blended 60% Blue Collar Annuitant and 40% Healthy Annuitant with generational projection using Scale SSA-2017.</li> </ul>

- Group D RP-2014 Blue Collar Annuitant with generational projection using Scale SSA-2017.

*Disabled Post-retirement:*

- All Groups RP-2014 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.

**Withdrawal from Service before Retirement:**

Assumed annual rates of withdrawal are as follows:

Service	Rate (%)		
	Male	Female	
	All Ages	Ages 25-34	Other Ages
0	22.5%	45.0%	30.0%
1	16.2	33.0	22.0
2	13.5	27.0	18.0
3	12.2	22.5	15.0
4	10.8	18.0	12.0
5	9.0	15.0	10.0
6	8.1	13.5	9.0
7	7.2	12.0	8.0
8	7.2	9.0	6.0
9	6.3	9.0	6.0
10+	3.6	7.5	5.0

**Disability Incidence:**

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

Age	Rate (%) <sup>1</sup>	
	Male	Female
25	0.0100%	0.0050%
30	0.0130	0.0065
35	0.0170	0.0085
40	0.0300	0.0150
45	0.0500	0.0250
50	0.0900	0.0450
55	0.1800	0.0900
60	0.3150	0.1575
65	0.3150	0.1575

<sup>1</sup> Disability rates stop after age 55 with 5 or more years of service.

**Retirement Rates:**

Age	Retirement Group A				
	Male	Female	Age	Male	Female
55	3.0%	4.9%	63	21.0%	22.5%
56	7.5	7.7	64	21.0	25.0
57	5.0	7.0	65	56.0	25.0
58	5.0	4.9	66	15.0	20.0
59	7.2	7.0	67	20.0	30.0
60	7.2	4.9	68	20.0	20.0
61	12.0	10.5	69	20.0	20.0
62	28.0	10.5	70	100.0	100.0

Age	Retirement Group B				
	Male	Female	Age	Male	Female
55	4.9%	4.9%	63	24.0%	14.0%
56	4.9	4.9	64	18.0	14.0
57	4.9	8.4	65	48.0	28.0
58	4.9	8.4	66	30.0	18.0
59	4.9	4.9	67	30.0	14.0
60	4.9	8.4	68	30.0	14.0
61	14.0	10.5	69	30.0	14.0
62	36.0	17.5	70	100.0	100.0

Age	Retirement Group C				
	Male	Female	Age	Male	Female
55	30.0%	0.0%	63	10.0%	20.0%
56	10.0	5.0	64	20.0	20.0
57	5.0	5.0	65	35.0	35.0
58	20.0	25.0	66	35.0	35.0
59	20.0	5.0	67	35.0	35.0
60	10.0	5.0	68	35.0	35.0
61	10.0	5.0	69	35.0	35.0
62	40.0	5.0	70	100.0	100.0

Age	Retirement Group D				
	<20 Years of Service	20+ Years of Service	Age	<20 Years of Service	20+ Years of Service
50	0.0%	40.0%	58	10.0%	10.0%
51	0.0	35.0	59	10.0	10.0
52	0.0	30.0	60	15.0	15.0
53	0.0	25.0	61	10.0	10.0
54	0.0	20.0	62	25.0	25.0
55	15.0	15.0	63	25.0	25.0
56	10.0	10.0	64	25.0	25.0
57	10.0	10.0	65	100.0	100.0

Rates shown are for participants with 5 or more years of service (unless otherwise indicated). For participants with less than 5 years of service, 0% is assumed.

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.

<b>Inactive Members:</b>	Valuation liability equals 200% of accumulated contributions.
<b>Future Administrative Expenses:</b>	An expense adjustment based on actual expenses for the previous year is reflected in the development of recommended employer contribution levels.
<b>Unknown Data for Participants:</b>	Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.
<b>Percent Married:</b>	85% of male members and 50% of female members are assumed to be married.
<b>Age of Spouse:</b>	Females three years younger than males.

<b>Actuarial Value of Assets:</b>	A smoothing method is used, under which the value of assets for actuarial purposes equals market value less a five-year phase-in of the differences between actual and assumed investment return. The value of assets for actuarial purposes may not differ from market value of assets by more than 20%.
<b>Actuarial Cost Method:</b>	Projected Benefit Cost Method. Normal contribution rates for each Group are equal to rates from the prior year, adjusted for increases or decreases in rates due to assumption changes or plan provision changes. An actuarial shortfall is determined as the present value of future employer contributions (equal to PVB, minus AVA, minus present value of future member contributions) minus the present value of future employer normal contributions. The actuarial shortfall is amortized in installments increasing by 5% per year. The actuarial determined contribution is equal to the employer's portion of Normal Cost (total normal contribution, less expected member contributions for the upcoming year), plus actuarial shortfall amortization payment.
<b>Changes in Actuarial Assumptions:</b>	<p>Based on reviews of economic assumptions, rates of mortality and future expectations of experience, the following actuarial assumptions was changed:</p> <ul style="list-style-type: none"> <li>• Assumed inflation was lowered from 3.00% to 2.50%.</li> <li>• Investment return was lowered from 7.95% to 7.50%.</li> <li>• Assumed COLA increases were lowered from 1.50% to 1.15% for Group A and from 1.80% to 1.30% for Groups B, C and D.</li> <li>• Mortality tables were updated from variations of RP-2000 with static projection to variations of RP-2014 with generational improvement.</li> </ul>

## 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.

<b>Effective Date:</b>	July 1, 1975.
<b>Creditable Service:</b>	Service as a member plus purchased service.
<b>Membership:</b>	Full time employees of participating municipalities. Municipality elects coverage under Groups A, B, C or D provisions.
<b>Average Final Compensation (AFC):</b>	<ul style="list-style-type: none"> <li>• Group A      Average annual compensation during highest 5 consecutive years.</li> <li>• Groups B/C    Average annual compensation during highest 3 consecutive years.</li> <li>• Group D      Average annual compensation during highest 2 consecutive years.</li> </ul>
<b>Normal Retirement – Eligibility:</b>	<ul style="list-style-type: none"> <li>• Group A      Earlier of age 65 with 5 years of service or age 55 with 35 years of service.</li> <li>• Group B      Earlier of age 62 with 5 years of service or age 55 with 30 years of service.</li> <li>• Groups C/D    Age 55 with 5 years of service.</li> </ul>
<b>Normal Retirement – Amount:</b>	<ul style="list-style-type: none"> <li>• Group A      1.4% of AFC times service.</li> <li>• Group B      1.7% of AFC times service as a Group B member plus percentage earned as a Group A member times AFC.</li> <li>• Group C      2.5% of AFC times service as a Group C member plus percentage earned as a Group A or B member times AFC.</li> <li>• Group D      2.5% of AFC times service as a Group D member plus percentage earned as a Group A, B or C member times AFC.</li> </ul> <p>Maximum benefit is 60% of AFC for Groups A and B and 50% of AFC for Groups C and D. The above amounts include the portion of the allowance provided by member contributions.</p>
<b>Early Retirement – Eligibility:</b>	<ul style="list-style-type: none"> <li>• Groups A/B    Age 55 with 5 years of service.</li> <li>• Group C      None.</li> <li>• Group D      Age 50 with 20 years of service.</li> </ul>
<b>Early Retirement – Amount:</b>	Normal retirement allowance based on service and AFC at early retirement, reduced by 6% for each year commencement precedes Normal Retirement Age for Group A and B members; payable without reduction to Group D members.
<b>Vesting:</b>	<ul style="list-style-type: none"> <li>• All groups – 5 years of service.</li> </ul>

	<ul style="list-style-type: none"> <li>• Allowance beginning at normal retirement age based on AFC and service at termination. The AFC is to be adjusted annually by one-half of the percentage change in the Consumer Price Index, subject to the limits on “Post-Retirement Adjustments” described below.</li> </ul>
<b>Disability Retirement – Eligibility:</b>	<ul style="list-style-type: none"> <li>• All groups – 5 years of service and disability as determined by Retirement Board.</li> </ul>
<b>Disability Retirement – Amount:</b>	<ul style="list-style-type: none"> <li>• All groups – Immediate allowance based on AFC and service to date of disability. Children’s benefit of 10% of AFC payable to up to three minor children (or children up to age 23 if enrolled in full-time studies) of a disabled Group D member.</li> </ul>
<b>Death Benefit – Eligibility:</b>	<ul style="list-style-type: none"> <li>• All groups – Death after 5 years of service.</li> </ul>
<b>Death Benefit – Amount:</b>	<ul style="list-style-type: none"> <li>• Groups A/B/C Reduced early retirement allowance under 100% survivor option commencing immediately or, if greater, survivor’s benefit under disability allowance computed as of date of death.</li> <li>• Group D 70% of the unreduced accrued benefit, plus children’s benefit.</li> </ul>
<b>Post-Retirement Adjustments:</b>	<ul style="list-style-type: none"> <li>• Group A Allowances in pay status for at least one year increased on each January 1 by one-half of the percentage increase in Consumer Price Index, but not more than 2%. If receiving an Early Retirement benefit, no increases until after reaching attaining Normal Retirement eligibility. If receiving a Disability Retirement benefit, no increases until after attaining age 62.</li> <li>• Groups B/C/D Allowances in payment for at least one year increased on each January 1 by one-half of the percentage increase in Consumer Price Index, but not more than 3%. If receiving an Early Retirement benefit, no increases until after reaching attaining Normal Retirement eligibility. If receiving a Disability Retirement benefit, no increases until after attaining age 62 (age 55 for Group C).</li> </ul>
<b>Retirement Stipend:</b>	\$25 per month payable at the option of the Retirement Board.
<b>Optional Benefit and Death after Retirement:</b>	<ul style="list-style-type: none"> <li>• Groups A/B/C A lifetime allowance or actuarially equivalent 50% or 100% joint and survivor allowance with refund of contribution guarantee.</li> <li>• Group D A lifetime allowance or 70% contingent annuitant option with no reduction.</li> </ul>
<b>Refund of Contributions:</b>	Upon termination, if the member so elects, or if no other benefit is payable, the member’s accumulated contributions with interest are refunded.
<b>Member Contribution Rates:</b>	<ul style="list-style-type: none"> <li>• Group A 2.50% effective July 1, 2000.</li> <li>• Group B 4.88% effective July 1, 2016.</li> <li>• Group C 10.00% effective January 1, 2016.</li> <li>• Group D 11.35% effective July 1, 2016.</li> </ul>
<b>Changes in Plan Provisions:</b>	There have been no changes in plan provisions since the last valuation.

## Section 5: Additional Summary Tables of Member Data

TABLE 1A – PARTICIPANTS IN ACTIVE SERVICE AS OF JUNE 30, 2017  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL

### All Employee Groups

Age	Years of Creditable Service								
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	241	239	2	--	--	--	--	--	--
	\$22,350	\$22,255	\$33,751	--	--	--	--	--	--
25 - 29	503	453	46	4	--	--	--	--	--
	\$33,019	\$31,448	\$48,385	\$34,288	--	--	--	--	--
30 - 34	590	416	141	32	1	--	--	--	--
	\$36,390	\$31,733	\$46,725	\$51,096	\$46,088	--	--	--	--
35 - 39	625	367	150	87	21	--	--	--	--
	\$37,193	\$30,211	\$44,250	\$50,192	\$54,950	--	--	--	--
40 - 44	680	347	157	108	58	9	1	--	--
	\$39,055	\$30,290	\$44,316	\$50,867	\$51,443	\$61,863	\$54,805	--	--
45 - 49	976	388	226	189	104	44	23	2	--
	\$39,761	\$31,760	\$40,663	\$46,898	\$43,148	\$57,523	\$57,593	\$43,701	--
50 - 54	1,116	349	260	224	160	62	40	17	4
	\$39,292	\$33,004	\$38,568	\$40,455	\$41,525	\$50,216	\$54,883	\$63,344	\$52,974
55 - 59	1,197	320	242	209	222	104	58	26	16
	\$39,003	\$33,026	\$40,519	\$40,608	\$35,953	\$44,335	\$47,513	\$56,391	\$63,177
60 - 64	951	219	175	194	148	91	76	23	25
	\$38,691	\$31,845	\$39,233	\$37,051	\$38,038	\$39,239	\$46,555	\$57,156	\$68,557
65 & over	423	91	71	78	70	47	40	15	11
	\$36,427	\$28,616	\$34,277	\$38,237	\$35,321	\$36,429	\$41,389	\$53,884	\$67,252
Total	7,302	3,189	1,470	1,125	784	357	238	83	56
	\$37,635	\$30,841	\$41,360	\$42,858	\$40,049	\$45,084	\$48,421	\$57,268	\$65,650

**TABLE 1B – PARTICIPANTS IN ACTIVE SERVICE AS OF JUNE 30, 2017  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**Group A**

Age	Years of Creditable Service								
	Total	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	92	92	--	--	--	--	--	--	--
	\$17,376	\$17,376	--	--	--	--	--	--	--
25 - 29	164	156	7	1	--	--	--	--	--
	\$21,858	\$21,113	\$35,271	\$44,152	--	--	--	--	--
30 - 34	177	131	38	8	--	--	--	--	--
	\$24,718	\$22,572	\$30,503	\$32,377	--	--	--	--	--
35 - 39	226	143	50	26	7	--	--	--	--
	\$27,595	\$25,331	\$30,634	\$32,421	\$34,214	--	--	--	--
40 - 44	223	127	54	25	15	1	1	--	--
	\$28,388	\$25,324	\$32,236	\$31,201	\$32,443	\$52,106	\$54,805	--	--
45 - 49	342	151	85	55	39	7	5	--	--
	\$28,848	\$25,902	\$28,184	\$32,400	\$32,435	\$42,024	\$43,586	--	--
50 - 54	426	130	94	104	58	18	12	7	3
	\$30,672	\$26,820	\$29,575	\$30,463	\$33,304	\$39,459	\$38,992	\$53,318	\$49,477
55 - 59	459	114	92	92	89	44	22	4	2
	\$31,518	\$27,721	\$33,398	\$32,082	\$28,792	\$36,324	\$35,525	\$53,334	\$63,371
60 - 64	406	87	78	92	65	36	32	10	6
	\$30,419	\$26,846	\$28,343	\$28,702	\$30,700	\$34,814	\$33,627	\$41,378	\$70,783
65 & over	186	43	28	34	33	20	18	6	4
	\$29,787	\$25,037	\$27,525	\$30,932	\$27,501	\$31,381	\$31,896	\$49,920	\$58,154
Total	2,701	1,174	526	437	306	126	90	27	15
	\$28,662	\$24,410	\$30,244	\$30,939	\$30,681	\$35,998	\$35,249	\$48,143	\$62,166

**TABLE 1C – PARTICIPANTS IN ACTIVE SERVICE AS OF JUNE 30, 2017  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**Group B**

Age	Years of Creditable Service								
	Total	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	116	114	2	--	--	--	--	--	--
	\$23,743	\$23,568	\$33,751	--	--	--	--	--	--
25 - 29	229	204	22	3	--	--	--	--	--
	\$32,453	\$31,363	\$42,759	\$31,000	--	--	--	--	--
30 - 34	277	210	55	11	1	--	--	--	--
	\$34,123	\$30,677	\$44,087	\$49,010	\$46,088	--	--	--	--
35 - 39	293	185	64	36	8	--	--	--	--
	\$36,056	\$29,994	\$43,760	\$48,091	\$60,434	--	--	--	--
40 - 44	328	176	73	48	25	6	--	--	--
	\$37,665	\$29,115	\$45,463	\$48,862	\$48,609	\$58,417	--	--	--
45 - 49	479	189	108	82	53	30	15	2	--
	\$39,813	\$32,378	\$42,906	\$40,176	\$45,108	\$55,471	\$58,689	\$43,701	--
50 - 54	553	191	128	88	80	35	23	7	1
	\$39,966	\$35,045	\$39,195	\$41,821	\$39,868	\$49,504	\$56,655	\$60,220	\$63,467
55 - 59	636	184	130	96	113	53	31	17	12
	\$40,290	\$34,446	\$43,154	\$42,411	\$35,040	\$46,146	\$51,985	\$50,854	\$60,309
60 - 64	467	112	86	88	69	48	36	11	17
	\$42,608	\$34,723	\$46,500	\$41,946	\$39,363	\$38,511	\$52,989	\$67,458	\$64,972
65 & over	205	41	37	39	33	21	20	8	6
	\$39,141	\$30,403	\$36,223	\$41,434	\$38,629	\$39,208	\$45,309	\$56,165	\$61,256
Total	3,583	1,606	705	491	382	193	125	45	36
	\$38,313	\$31,436	\$42,770	\$42,896	\$39,988	\$45,932	\$52,870	\$56,996	\$62,757

**TABLE 1D – PARTICIPANTS IN ACTIVE SERVICE AS OF JUNE 30, 2017  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**Group C**

Age	Years of Creditable Service								
	Total	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	28	28	--	--	--	--	--	--	--
	\$29,636	\$29,636	--	--	--	--	--	--	--
25 - 29	95	79	16	--	--	--	--	--	--
	\$50,618	\$48,494	\$61,109	--	--	--	--	--	--
30 - 34	109	64	35	10	--	--	--	--	--
	\$53,959	\$49,209	\$60,163	\$62,646	--	--	--	--	--
35 - 39	85	33	29	19	4	--	--	--	--
	\$59,353	\$47,813	\$63,356	\$71,891	\$65,966	--	--	--	--
40 - 44	97	40	24	21	11	1	--	--	--
	\$58,538	\$48,689	\$62,466	\$65,949	\$68,870	\$88,892	--	--	--
45 - 49	123	40	30	40	7	3	3	--	--
	\$61,598	\$47,494	\$64,642	\$71,303	\$65,666	\$66,468	\$75,457	--	--
50 - 54	119	28	33	25	18	8	4	3	--
	\$61,489	\$47,797	\$57,836	\$66,615	\$66,678	\$71,861	\$86,927	\$94,028	--
55 - 59	93	21	19	16	20	6	4	5	2
	\$63,422	\$49,426	\$54,365	\$66,785	\$72,975	\$78,973	\$69,188	\$77,666	\$80,186
60 - 64	76	19	11	14	14	7	8	1	2
	\$58,484	\$38,710	\$59,645	\$61,143	\$65,582	\$66,985	\$69,317	\$70,941	\$92,348
65 & over	32	7	6	5	4	6	2	1	1
	\$57,628	\$40,134	\$53,782	\$62,969	\$72,549	\$43,525	\$87,623	\$59,418	\$139,613
<b>Total</b>	<b>857</b>	<b>359</b>	<b>203</b>	<b>150</b>	<b>78</b>	<b>31</b>	<b>21</b>	<b>10</b>	<b>5</b>
	\$57,554	\$46,318	\$60,490	\$67,561	\$68,579	\$66,680	\$75,267	\$80,077	\$96,936

**TABLE 1E – PARTICIPANTS IN ACTIVE SERVICE AS OF JUNE 30, 2017  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**Group D**

Age	Years of Creditable Service								
	Total	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	5	5	--	--	--	--	--	--	--
	\$40,742	\$40,742	--	--	--	--	--	--	--
25 - 29	15	14	1	--	--	--	--	--	--
	\$52,227	\$51,645	\$60,374	--	--	--	--	--	--
30 - 34	27	11	13	3	--	--	--	--	--
	\$65,234	\$59,288	\$69,129	\$70,156	--	--	--	--	--
35 - 39	21	6	7	6	2	--	--	--	--
	\$66,653	\$56,384	\$66,821	\$71,092	\$83,558	--	--	--	--
40 - 44	32	4	6	14	7	1	--	--	--
	\$68,573	\$55,662	\$66,484	\$70,234	\$74,890	\$65,271	--	--	--
45 - 49	32	8	3	12	5	4	--	--	--
	\$71,698	\$49,085	\$73,699	\$77,932	\$74,413	\$93,324	--	--	--
50 - 54	18	0	5	7	4	1	1	--	--
	\$75,829	\$0	\$64,397	\$78,291	\$80,658	\$95,618	\$76,648	--	--
55 - 59	9	1	1	5	0	1	1	--	--
	\$77,385	\$32,261	\$89,925	\$79,075	\$0	\$93,006	\$85,901	--	--
60 - 64	2	1	0	0	0	0	0	1	--
	\$50,950	\$14,078	\$0	\$0	\$0	\$0	\$0	\$87,821	--
65 & over	0	0	0	0	0	0	0	0	--
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	--
<b>Total</b>	<b>161</b>	<b>50</b>	<b>36</b>	<b>47</b>	<b>18</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>--</b>
	\$67,081	\$51,578	\$68,297	\$74,445	\$77,002	\$89,598	\$81,275	\$87,821	--

**TABLE 2A – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**  
**All Employee Groups**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤35	0	\$0	0	\$0	3	\$13,175
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	1	8,269	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	1	1,031
42	0	0	0	0	0	0
43	0	0	0	0	2	2,712
44	0	0	0	0	0	0
45	0	0	1	19,969	0	0
46	0	0	0	0	0	0
47	0	0	0	0	1	5,322
48	0	0	2	15,027	0	0
49	0	0	0	0	1	4,895
50	0	0	1	9,263	2	11,461
51	1	9,529	3	16,535	1	10,780
52	1	33,723	4	58,478	1	3,268
53	1	6,000	0	0	1	9,922
54	2	27,948	1	1,595	0	0
55	14	242,424	1	5,191	5	26,261
56	11	225,061	1	3,090	3	33,264
57	15	334,088	3	28,014	3	6,787
58	25	532,652	3	25,542	2	17,317
59	23	405,776	2	13,803	4	25,541
60	34	657,974	2	7,649	5	46,951
61	36	721,314	5	45,443	3	25,573
62	85	1,061,472	0	0	4	13,273
63	107	1,378,992	8	99,794	3	13,656
64	107	1,082,390	4	61,985	3	10,067
65	143	1,500,862	1	3,642	1	7,740

**TABLE 2A – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

All Employee Groups (Continued)

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	161	\$1,553,356	3	\$16,646	6	\$51,364
67	152	1,438,989	3	11,852	5	36,963
68	190	1,696,072	1	13,315	4	41,537
69	172	1,602,267	1	4,063	9	44,669
70	157	1,288,719	1	12,492	7	58,564
71	128	1,219,442	1	2,733	9	60,702
72	138	1,132,707	2	15,741	11	60,736
73	100	836,918	2	12,101	6	30,897
74	106	947,564	0	0	7	35,276
75	102	765,761	2	7,048	5	11,382
76	88	716,117	1	2,456	3	7,566
77	76	696,202	1	4,352	6	38,632
78	68	486,138	2	11,789	11	69,820
79	51	321,725	1	3,438	10	66,432
80	57	421,243	2	6,928	5	59,801
81	46	330,885	0	0	5	19,481
82	40	299,330	0	0	5	13,078
83	29	175,088	1	2,371	9	51,648
84	32	189,237	0	0	8	42,537
85	25	130,892	0	0	6	14,266
86	38	207,243	0	0	4	28,827
87	21	98,858	0	0	6	32,409
88	13	90,228	0	0	2	10,502
89	18	89,190	0	0	5	12,760
90	10	59,347	0	0	1	2,239
91	12	56,952	0	0	1	1,287
92	8	54,858	0	0	1	1,949
93	4	22,278	0	0	2	12,890
94	6	17,678	0	0	1	1,695
≥95	11	36,361	0	0	2	2,591
Total	2664	\$25,201,850	67	\$550,613	211	\$1,211,499

**TABLE 2B – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

**Group A**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤35	0	\$0	0	\$0	1	\$4,760
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
43	0	0	0	0	1	1,692
44	0	0	0	0	0	0
45	0	0	0	0	0	0
46	0	0	0	0	0	0
47	0	0	0	0	0	0
48	0	0	1	7,704	0	0
49	0	0	0	0	0	0
50	0	0	0	0	0	0
51	0	0	1	2,089	0	0
52	0	0	0	0	1	3,268
53	0	0	0	0	0	0
54	0	0	1	1,595	0	0
55	0	0	1	5,191	2	3,972
56	0	0	1	3,090	0	0
57	1	1,134	2	16,343	2	2,954
58	3	27,855	1	8,175	0	0
59	4	19,767	2	13,803	2	3,111
60	5	24,673	1	2,864	2	10,722
61	10	63,084	0	0	1	1,733
62	19	115,307	0	0	2	4,873
63	24	203,745	2	10,377	1	2,985
64	33	170,161	1	7,674	2	3,597
65	50	250,707	0	0	0	0

**TABLE 2B – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

Group A (Continued)

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	66	\$317,003	1	\$2,026	4	\$14,532
67	61	341,162	2	5,737	0	0
68	90	469,146	1	13,315	1	26,100
69	73	382,504	1	4,063	3	6,393
70	78	425,879	1	12,492	1	16,994
71	57	360,530	0	0	3	19,787
72	66	370,312	1	6,787	6	31,103
73	40	199,126	1	5,568	1	3,692
74	39	255,063	0	0	3	6,831
75	41	229,229	1	5,085	3	6,273
76	34	161,037	0	0	1	3,595
77	31	190,773	0	0	4	13,815
78	31	173,170	1	4,539	5	17,958
79	19	60,655	1	3,438	4	12,632
80	19	100,908	2	6,928	1	3,031
81	14	55,923	0	0	0	0
82	22	126,651	0	0	4	10,816
83	10	53,866	1	2,371	2	5,916
84	17	77,472	0	0	1	2,206
85	11	43,349	0	0	3	6,171
86	18	52,427	0	0	1	4,467
87	13	58,365	0	0	2	8,546
88	6	34,371	0	0	1	3,119
89	8	32,613	0	0	5	12,760
90	6	28,542	0	0	1	2,239
91	5	12,574	0	0	1	1,287
92	5	37,247	0	0	1	1,949
93	3	13,261	0	0	1	9,226
94	5	16,070	0	0	1	1,695
≥95	10	33,890	0	0	2	2,591
Total	1047	\$5,589,551	28	\$151,255	83	\$299,392

**TABLE 2C – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

**Group B**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤35	0	\$0	0	\$0	2	\$8,415
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	1	1,031
42	0	0	0	0	0	0
43	0	0	0	0	1	1,019
44	0	0	0	0	0	0
45	0	0	1	19,969	0	0
46	0	0	0	0	0	0
47	0	0	0	0	1	5,322
48	0	0	1	7,323	0	0
49	0	0	0	0	1	4,895
50	0	0	0	0	2	11,461
51	0	0	1	8,077	1	10,780
52	0	0	1	3,424	0	0
53	0	0	0	0	1	9,922
54	1	5,877	0	0	0	0
55	2	7,812	0	0	3	22,289
56	5	85,976	0	0	3	33,264
57	4	93,911	1	11,671	1	3,833
58	6	70,049	1	10,121	1	1,578
59	7	105,475	0	0	2	22,430
60	11	167,068	1	4,785	2	21,941
61	12	182,763	5	45,443	1	6,646
62	49	481,845	0	0	2	8,400
63	60	660,630	3	21,239	0	0
64	60	660,355	3	54,310	1	6,470
65	75	885,051	1	3,642	0	0

**TABLE 2C – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

Group B (Continued)

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	85	\$971,880	2	\$14,620	2	\$36,832
67	76	824,429	1	6,114	4	26,250
68	82	837,005	0	0	2	9,781
69	80	843,453	0	0	6	38,275
70	67	638,443	0	0	4	18,238
71	59	635,021	1	2,733	6	40,915
72	59	524,334	1	8,954	4	24,296
73	51	525,366	1	6,533	4	23,585
74	52	407,650	0	0	3	25,332
75	51	414,148	1	1,963	2	5,109
76	43	369,800	1	2,456	2	3,970
77	36	363,438	1	4,352	1	8,334
78	29	228,400	1	7,250	4	42,623
79	31	254,688	0	0	5	40,646
80	33	280,400	0	0	4	56,770
81	29	228,527	0	0	4	15,844
82	15	112,995	0	0	1	2,262
83	17	108,188	0	0	6	36,803
84	14	104,877	0	0	7	40,331
85	13	81,255	0	0	3	8,096
86	19	153,194	0	0	3	24,360
87	7	36,328	0	0	3	18,979
88	7	55,857	0	0	1	7,383
89	10	56,577	0	0	0	0
90	3	19,400	0	0	0	0
91	7	44,377	0	0	0	0
92	3	17,610	0	0	0	0
93	1	9,017	0	0	1	3,663
94	1	1,608	0	0	0	0
≥95	1	2,471	0	0	0	0
Total	1273	\$12,557,547	29	\$244,979	108	\$738,378

**TABLE 2D – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

**Group C**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤35	0	\$0	0	\$0	0	\$0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	1	8,269	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
43	0	0	0	0	0	0
44	0	0	0	0	0	0
45	0	0	0	0	0	0
46	0	0	0	0	0	0
47	0	0	0	0	0	0
48	0	0	0	0	0	0
49	0	0	0	0	0	0
50	0	0	1	9,263	0	0
51	1	9,529	1	6,369	0	0
52	0	0	2	28,257	0	0
53	0	0	0	0	0	0
54	0	0	0	0	0	0
55	6	114,907	0	0	0	0
56	4	93,502	0	0	0	0
57	8	157,637	0	0	0	0
58	12	305,028	1	7,246	1	15,739
59	10	190,728	0	0	0	0
60	15	351,078	0	0	1	14,288
61	12	391,111	0	0	1	17,193
62	15	356,205	0	0	0	0
63	21	463,825	2	50,823	2	10,672
64	13	228,010	0	0	0	0
65	17	336,283	0	0	1	7,740

**TABLE 2D – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

Group C (Continued)

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	9	\$201,643	0	\$0	0	\$0
67	15	273,398	0	0	1	10,712
68	18	389,922	0	0	1	5,656
69	18	323,173	0	0	0	0
70	12	224,396	0	0	2	23,333
71	11	209,298	0	0	0	0
72	12	222,489	0	0	1	5,337
73	9	112,426	0	0	1	3,621
74	15	284,852	0	0	1	3,113
75	10	122,384	0	0	0	0
76	11	185,279	0	0	0	0
77	9	141,990	0	0	1	16,482
78	8	84,568	0	0	2	9,239
79	1	6,382	0	0	1	13,154
80	5	39,936	0	0	0	0
81	3	46,435	0	0	1	3,637
82	3	59,683	0	0	0	0
83	2	13,034	0	0	1	8,929
84	1	6,888	0	0	0	0
85	1	6,288	0	0	0	0
86	1	1,623	0	0	0	0
87	1	4,165	0	0	1	4,884
88	0	0	0	0	0	0
89	0	0	0	0	0	0
90	1	11,405	0	0	0	0
91	0	0	0	0	0	0
92	0	0	0	0	0	0
93	0	0	0	0	0	0
94	0	0	0	0	0	0
≥95	0	0	0	0	0	0
Total	310	\$5,969,501	8	\$110,227	20	\$173,729

**TABLE 2E – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

**Group D**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤35	0	\$0	0	\$0	0	\$0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
43	0	0	0	0	0	0
44	0	0	0	0	0	0
45	0	0	0	0	0	0
46	0	0	0	0	0	0
47	0	0	0	0	0	0
48	0	0	0	0	0	0
49	0	0	0	0	0	0
50	0	0	0	0	0	0
51	0	0	0	0	0	0
52	1	33,723	1	26,797	0	0
53	1	6,000	0	0	0	0
54	1	22,071	0	0	0	0
55	6	119,706	0	0	0	0
56	2	45,583	0	0	0	0
57	2	81,406	0	0	0	0
58	4	129,720	0	0	0	0
59	2	89,805	0	0	0	0
60	3	115,157	0	0	0	0
61	2	84,356	0	0	0	0
62	2	108,115	0	0	0	0
63	2	50,791	1	17,355	0	0
64	1	23,864	0	0	0	0
65	1	28,820	0	0	0	0

**TABLE 2E – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY ATTAINED AGE**

Group D (Continued)

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	1	\$62,831	0	\$0	0	\$0
67	0	0	0	0	0	0
68	0	0	0	0	0	0
69	1	53,138	0	0	0	0
70	0	0	0	0	0	0
71	1	14,594	0	0	0	0
72	1	15,572	0	0	0	0
73	0	0	0	0	0	0
74	0	0	0	0	0	0
75	0	0	0	0	0	0
76	0	0	0	0	0	0
77	0	0	0	0	0	0
78	0	0	0	0	0	0
79	0	0	0	0	0	0
80	0	0	0	0	0	0
81	0	0	0	0	0	0
82	0	0	0	0	0	0
83	0	0	0	0	0	0
84	0	0	0	0	0	0
85	0	0	0	0	0	0
86	0	0	0	0	0	0
87	0	0	0	0	0	0
88	0	0	0	0	0	0
89	0	0	0	0	0	0
90	0	0	0	0	0	0
91	0	0	0	0	0	0
92	0	0	0	0	0	0
93	0	0	0	0	0	0
94	0	0	0	0	0	0
≥95	0	0	0	0	0	0
Total	34	\$1,085,250	2	\$44,152	0	0

**TABLE 3 – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY YEAR OF RETIREMENT**

**All Employee Groups**

Year of Retirement	Number	Annual Allowance	Average Annual Allowance
≤1970	0	\$0	\$0
1971	0	0	0
1972	0	0	0
1973	0	0	0
1974	0	0	0
1975	0	0	0
1976	0	0	0
1977	0	0	0
1978	0	0	0
1979	0	0	0
1980	2	2,876	1,438
1981	0	0	0
1982	1	812	812
1983	3	6,037	2,012
1984	1	979	979
1985	4	7,725	1,931
1986	3	12,900	4,300
1987	2	3,738	1,869
1988	7	24,271	3,467
1989	6	27,969	4,661
1990	14	72,344	5,167
1991	19	71,039	3,739
1992	18	79,132	4,396
1993	20	110,391	5,520
1994	32	184,229	5,757
1995	42	263,139	6,265
1996	30	171,363	5,712
1997	39	234,280	6,007
1998	46	278,175	6,047
1999	44	300,615	6,832
2000	36	241,520	6,709

### TABLE 3 – SUMMARY OF RETIRED MEMBER AND BENEFICIARY DATA BY YEAR OF RETIREMENT

All Employee Groups (continued)

Year of Retirement	Number	Annual Allowance	Average Annual Allowance
2001	50	\$347,706	\$6,954
2002	81	617,043	7,618
2003	83	561,835	6,769
2004	84	754,390	8,981
2005	93	740,665	7,964
2006	91	844,625	9,282
2007	138	1,138,609	8,251
2008	118	1,029,569	8,725
2009	131	1,032,609	7,883
2010	158	1,513,546	9,579
2011	184	1,937,010	10,527
2012	192	1,921,641	10,009
2013	214	2,351,614	10,989
2014	256	2,505,979	9,789
2015	246	2,596,582	10,555
2016	243	2,430,141	10,001
2017	211	2,546,863	12,070
Total	2942	\$26,963,962	\$9,165