

**Vermont State Employees'  
Retirement System  
Actuarial Valuation and  
Review as of June 30, 2018**

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

 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 19, 2018

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

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2018, of the Vermont State Employees' Retirement System. This report summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirement for the fiscal year ending June 30, 2020.

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

  
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, 2018, pursuant to section 471, subsection (k), of Title 3, Chapter 16, Vermont Statutes Annotated, relating to the Vermont State 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, 2018 for the System is provided in separate reports.

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, 2018, provided by the Office of the State Treasurer;
- The unaudited assets of the Plan as of June 30, 2018, 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 prescribed by State statute.

## Valuation Highlights

1. Segal strongly recommends an actuarial funding policy 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. Section 473, subsection (c)(4), of Title 3, Chapter 16, Subchapter 1, Vermont Statutes Annotated calls for annual payments on the unfunded actuarial accrued liability to be made over a closed period ending on June 30, 2038. From July 1, 2009 to June 30, 2019, the amount of each annual payment is calculated assuming that the amortization period would remain closed and that the amortization amount would increase annually at the rate of 5% over the preceding year. Beginning on July 1, 2019 and annually thereafter, the amount of each annual payment is calculated assuming that the amortization period will remain closed and that the amortization amount will increase annually at the rate of 3% over the preceding year.
2. Actual employer contributions made during the fiscal year ending June 30, 2018, were \$64.6 million, or 124.0% of the actuarially determined contribution of \$52.1 million. In the prior fiscal year, actual employer contributions were \$60.3 million, or 121.1% of the prior year's actuarially determined contribution.
3. The actuarially determined contribution for the fiscal year ending June 30, 2019, is \$63.0 million as determined with the June 30, 2017, actuarial valuation.
4. The funded percentage (the ratio of the actuarial value of assets to actuarial accrued liability) is 70.7%, compared to the prior year's funded percentage of 71.4%. This percentage is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded percentage is 69.2%, compared to 69.6% 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.
5. The results of this June 30, 2018, actuarial valuation are used to determine the actuarially determined contribution for the fiscal year ending June 30, 2020, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2021. The actuarially determined contribution for fiscal 2020 is \$78.9 million, an increase of \$15.9 million from fiscal 2019. The actuarially determined contribution is equal to the Plan's employer normal cost, plus the amount necessary to amortize the unfunded actuarial accrued liability as of June 30, 2018, 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 3% over the preceding year.
6. The unfunded actuarial accrued liability is \$779.8 million, which is an increase of \$62.2 million since the prior valuation.
7. The rate of return on the market value of assets was 7.4% for the July 1, 2017 to June 30, 2018 plan year. The return on the actuarial value of assets was 6.9% for the same period due to the recognition of prior year's investment gains and losses. We advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments.

8. The actuarial value of assets is 102.2% 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 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 \$40.3 million will also have an impact on the future funded percentage. If the net deferred losses were recognized immediately in the actuarial value of assets, the actuarially determined contribution rate would increase from 12.32% to about 12.80% of payroll.
9. The actuarial loss from investment experience is \$10.1 million.
10. The net experience loss from sources other than investment experience was approximately, \$54.4 million, or 2.0% of the actuarial accrued liability. Additional detail regarding this loss is shown in *Section 2, Exhibit C*.
11. 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, 2018, and June 30, 2019, 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.
12. This actuarial report as of June 30, 2018, 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

		2018	2017
<b>Actuarially determined employer contributions:</b>	• Actuarially determined employer contributions for fiscal 2020 (and 2019)	\$78,943,914	\$62,984,742
	• Estimated actuarially determined contributions for fiscal 2021 (and 2020)	81,400,167	74,038,986
<b>Actuarial accrued liability for plan year beginning July 1:</b>	• Retired members and beneficiaries	\$1,586,816,488	\$1,459,055,067
	• Deferred members as reported by the System	45,291,375	41,893,444
	• Active members	989,156,560	975,037,561
	• Inactive members as reported by the System	40,344,434	35,386,383
	• Total	2,661,608,857	2,511,372,455
	• Employer normal cost for plan year beginning July 1	16,992,303	15,835,914
<b>Assets for plan year beginning July 1:</b>	• Market value of assets (MVA)	\$1,841,500,283	\$1,748,442,294
	• Actuarial value of assets (AVA)	1,881,804,847	1,793,794,733
	• Actuarial value of assets as a percentage of market value of assets	102.19%	102.59%
<b>Funded status for plan year beginning July 1:</b>	• Unfunded actuarial accrued liability based on MVA	\$820,108,574	\$762,930,161
	• Funded percentage on MVA basis	69.19%	69.62%
	• Unfunded actuarial accrued liability based on AVA	\$779,804,010	\$717,577,722
	• Funded percentage on AVA basis	70.70%	71.43%
	• Remaining amortization period	20	21
<b>Key assumptions:</b>	• Interest rate	7.50%	7.50%
	• Inflation rate	2.50%	2.50%
<b>Demographic data for plan year beginning July 1:</b>	• Number of retired members and beneficiaries	6,974	6,727
	• Number deferred members as reported by the System	753	742
	• Number of inactive members as reported by the System	1,266	1,098
	• Number of active members	8,530	8,620
	• Total payroll	\$521,670,606	\$504,553,289
	• Average payroll	61,157	58,533
	• Total monthly benefits for all retired members and beneficiaries	11,172,785	10,469,053
	• Average monthly benefit for all retired members and beneficiaries	1,602	1,556

## 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 members 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 member 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 members, including active members, inactive members, retired members and beneficiaries.

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

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

#### MEMBER POPULATION: 2009 – 2018

As of July 1	Active Members	Deferred Members as Reported by the System*	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives
2009	8,095	798	4,797	5,595	0.69
2010	7,782	765	5,201	5,966	0.77
2011	7,768	774	5,375	6,149	0.79
2012	7,878	767	5,600	6,367	0.81
2013	8,158	741	5,795	6,536	0.80
2014	8,325	732	5,980	6,712	0.81
2015	8,446	735	6,204	6,939	0.82
2016	8,436	728	6,542	7,270	0.86
2017	8,620	742	6,727	7,469	0.87
2018	8,530	753	6,974	7,727	0.91

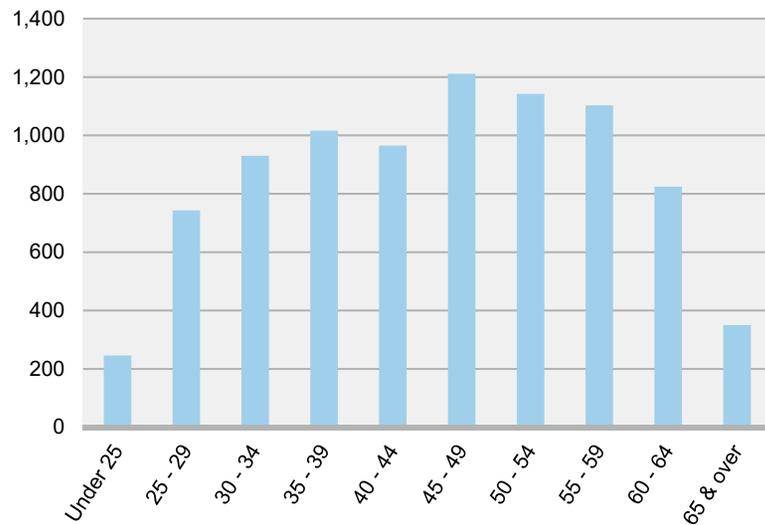
\*Excludes inactive members as reported by the System

## Active Members

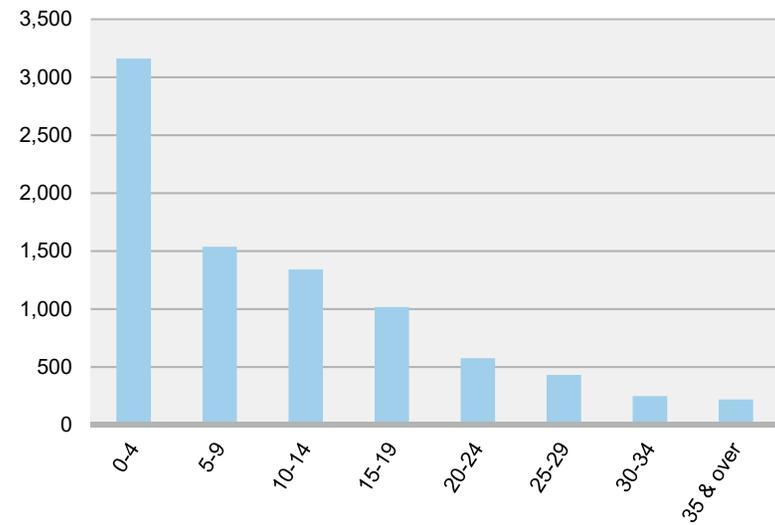
Plan costs are affected by the age, years of creditable service and payroll of active members. In this year's valuation, there were 8,530 active members with an average age of 45.9, average years of creditable service of 11.0 years, and average payroll of \$61,157. The 8,620 active members in the prior valuation had an average age of 46.0, average service of 11.1 years and average payroll of \$58,533.

### Distribution of Active Members as of July 1, 2018

BY AGE



BY YEARS OF CREDITABLE SERVICE



## **Inactive and Deferred Members**

In this year's valuation, there were 1,266 inactive members as reported by the System. A member is reported as inactive if they have withdrawn from active employment within the three-year period preceding the valuation date, or if they withdrew prior to the three-year period preceding the valuation date, but do not have a vested right to a deferred or immediate vested benefit and have not taken a refund of their employee contributions.

In addition, there were 753 deferred members as reported by the System. A member is reported as deferred if they have withdrawn from active employment prior to the three-year period preceding the valuation date and have a vested right to a deferred or immediate vested benefit.

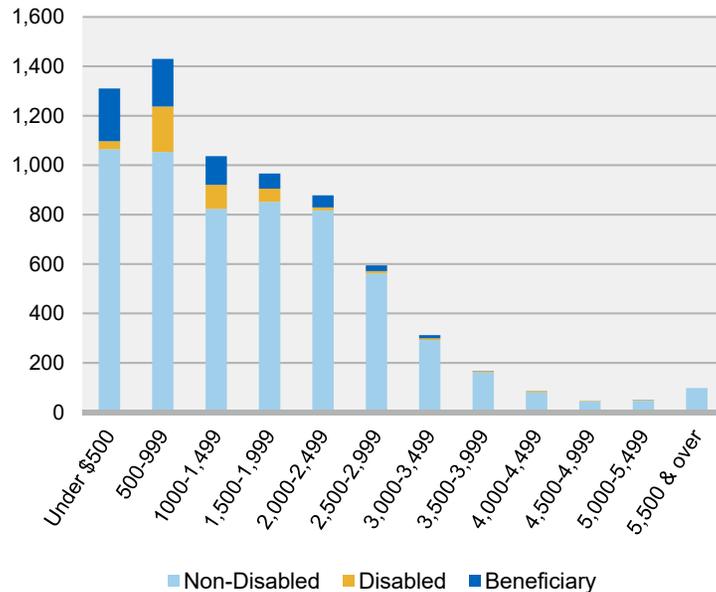
## Retired Members and Beneficiaries

As of June 30, 2018, 6,302 retired members (including disability retirees) and 672 beneficiaries were receiving total monthly benefits of \$11,172,785. For comparison, in the previous valuation, there were 6,092 retired members and 635 beneficiaries receiving monthly benefits of \$10,469,053.

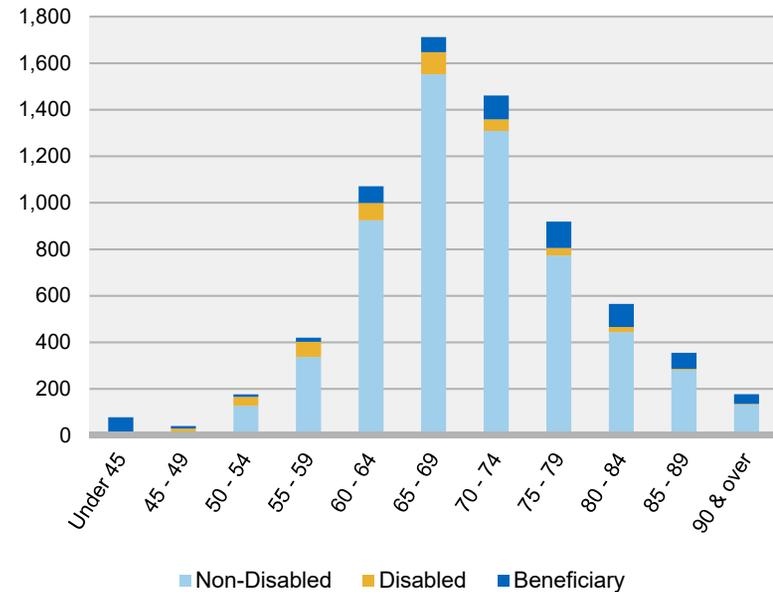
As of June 30, 2018, the average monthly benefit for retired members and beneficiaries is \$1,602, compared to \$1,556 in the previous valuation. The average age for retired members and beneficiaries is 70.3 in the current valuation, compared with 70.5 in the prior valuation.

### Distribution of Pensioners as of July 1, 2018

BY TYPE AND MONTHLY AMOUNT



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: 2009 – 2018

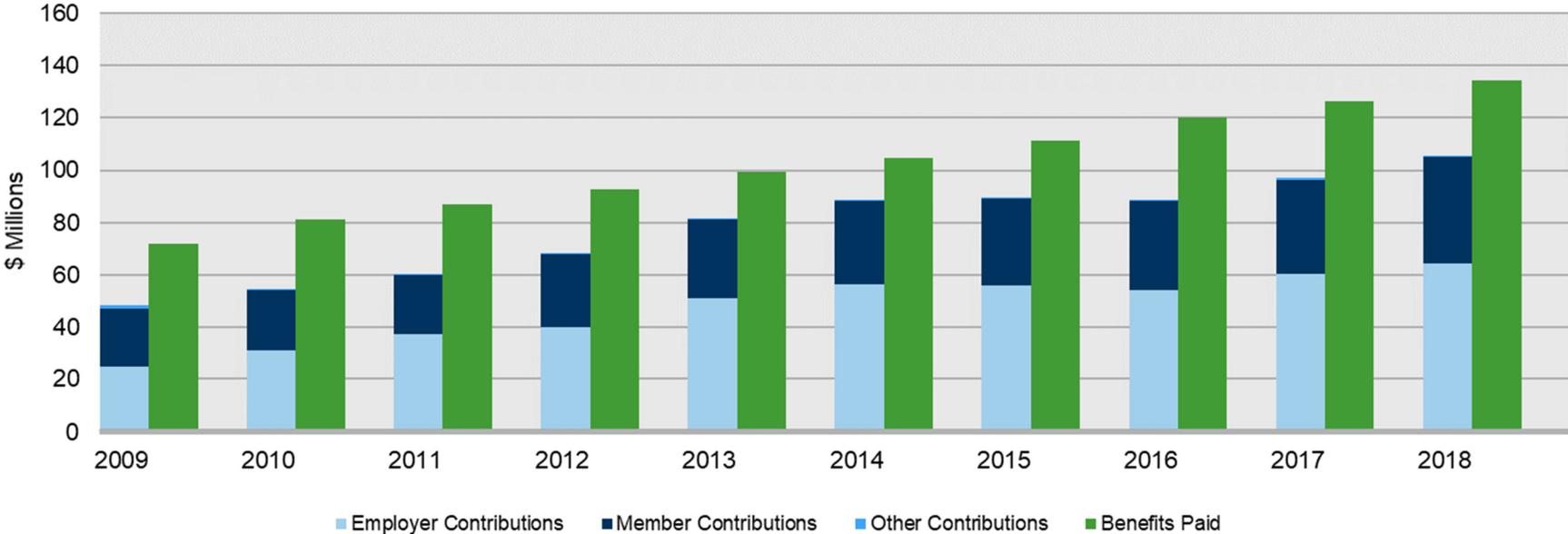
As of July 1	Active Members			Retired Members		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2009	8,095	47.0	12.7	4,262	--	\$1,332
2010	7,782	47.0	12.6	4,678	--	1,348
2011	7,768	47.0	12.6	4,851	--	1,398
2012	7,878	46.4	12.5	5,060	--	1,450
2013	8,158	46.2	12.2	5,248	--	1,478
2014	8,325	45.2	11.8	5,421	69.7	1,510
2015	8,446	46.5	11.7	5,554	70.0	1,561
2016	8,436	46.2	11.3	5,858	70.1	1,587
2017	8,620	46.0	11.1	6,092	70.3	1,616
2018	8,530	45.9	11.0	6,302	70.4	1,663

## 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, 2009 – 2018**



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 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.

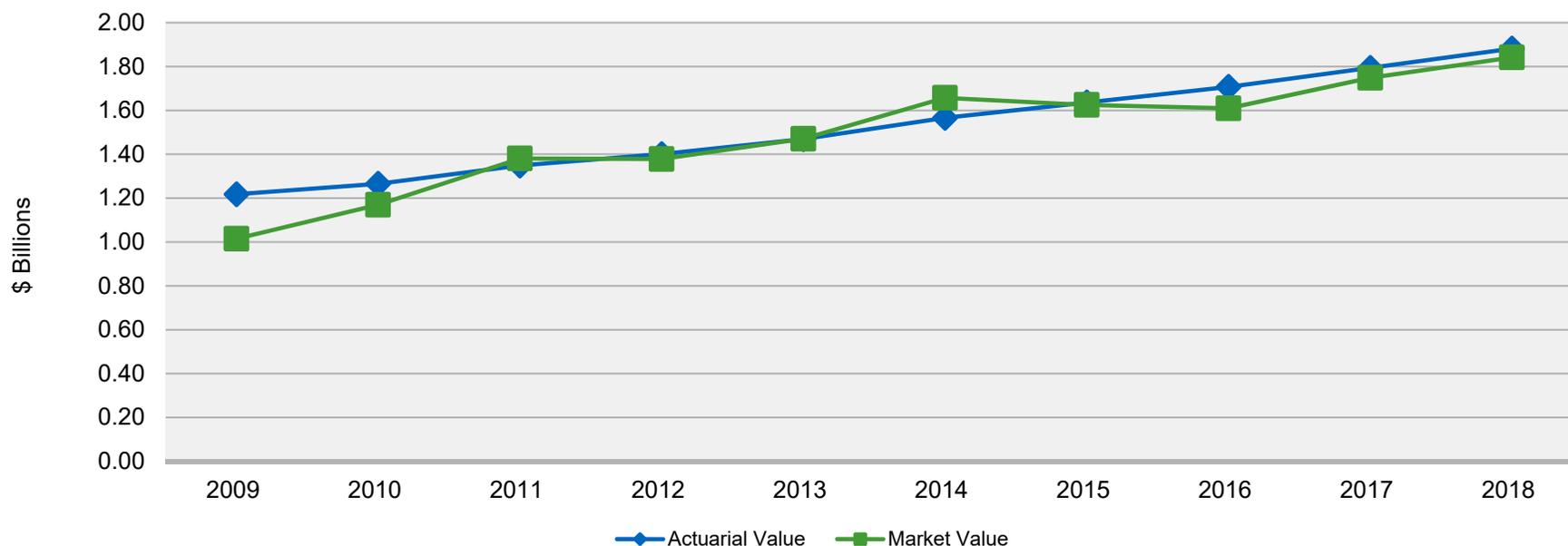
### DETERMINATION OF ACTUARIAL VALUE OF ASSETS FOR YEAR ENDED JUNE 30, 2018

<b>1</b>	Actuarial value of assets, June 30, 2017		\$1,793,794,733
<b>2</b>	Net new money, including expected investment income (7.50%)		98,086,256
<b>3</b>	Preliminary asset value: <b>1 + 2</b>		1,891,880,989
<b>4</b>	Smoothing adjustment		
	(a) Market value, June 30, 2018	\$1,841,500,283	
	(b) Preliminary asset value	1,891,880,989	
	(c) Unrecognized appreciation	-50,380,706	
	(d) Adjustment	x 20%	-10,076,141
<b>5</b>	Actuarial value of assets, June 30, 2018: <b>3 + 4d</b>		\$1,881,804,848

The assets for valuation purposes are 102.19% of market value.

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, 2009 – 2018



### 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 loss is \$64,440,183, which includes \$10,076,141 from investment losses and \$54,364,042 in losses from all other sources. The net experience variation from individual sources other than investments was 2.0% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

#### ACTUARIAL EXPERIENCE FOR YEAR ENDED JUNE 30, 2018

<b>1</b>	Net loss from investments*	-\$10,076,141
<b>2</b>	Net loss from other experience	<u>-54,364,042</u>
<b>3</b>	Net experience loss: <b>1 + 2</b>	-\$64,440,183

\* 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 7.41% for the year ended June 30, 2018.

For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.50%. The actual rate of return on an actuarial basis for the 2018 plan year was 6.93%. 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, 2018 with regard to its investments.

### INVESTMENT EXPERIENCE

	Year Ended June 30, 2018	
	Market Value	Actuarial Value
<b>1</b> Investment income	\$128,188,928	\$123,141,054
<b>2</b> Average value of assets	1,730,876,825	1,776,229,264
<b>3</b> Rate of return: <b>1 ÷ 2</b>	7.41%	6.93%
<b>4</b> Assumed rate of return	7.50%	7.50%
<b>5</b> Expected investment income: <b>2 x 4</b>	\$129,815,762	\$133,217,195
<b>6</b> Actuarial gain/(loss): <b>1 – 5</b>	<u>-\$1,626,834</u>	<u>-\$10,076,141</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.

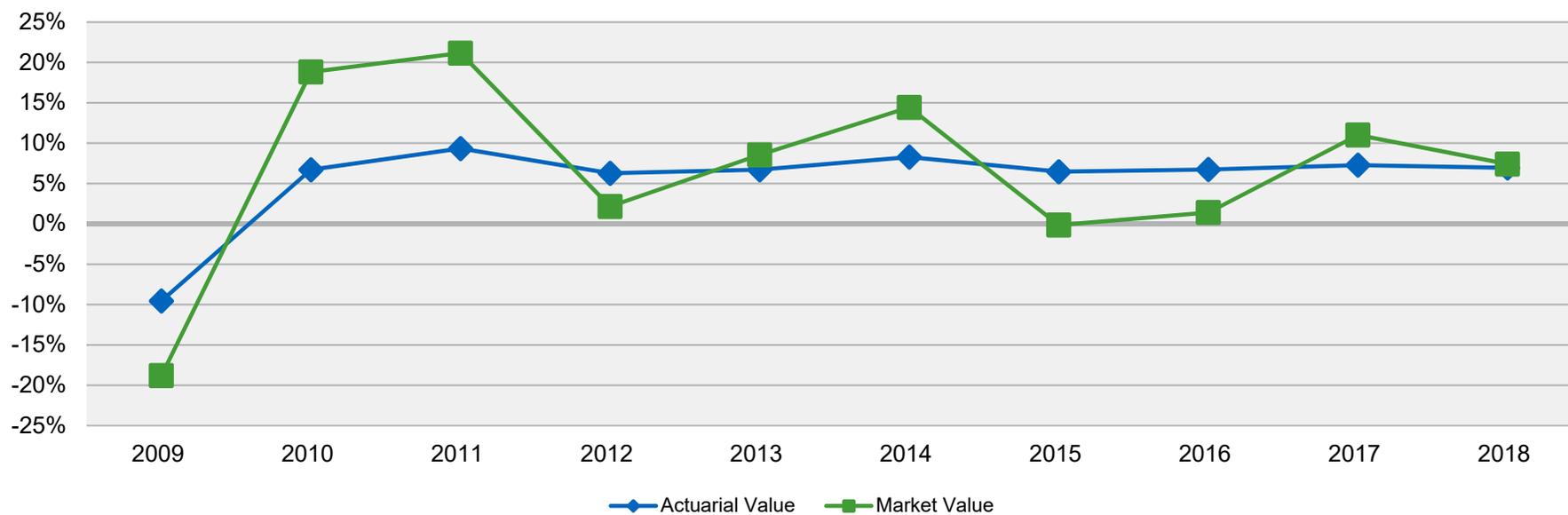
### INVESTMENT RETURN – ACTUARIAL VALUE VS. MARKET VALUE: 1999 - 2018

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		
1999	\$105,789,263	14.77%	\$83,345,613	9.28%	2009	-\$130,060,430	-9.55%	-\$238,392,427	-18.80%		
2000	113,086,381	14.25	117,824,509	12.37	2010	80,550,116	6.71	187,930,419	18.82		
2001	89,249,154	10.14	-66,366,171	-6.36	2011	116,660,083	9.34	244,063,320	21.16		
2002	57,320,146	6.07	-49,030,960	-5.15	2012	83,600,231	6.27	29,466,721	2.16		
2003	55,169,045	5.63	45,639,510	5.17	2013	93,222,330	6.71	116,835,891	8.55		
2004	75,261,848	7.41	142,588,476	15.70	2014	120,645,037	8.28	210,491,370	14.43		
2005	84,075,397	7.83	95,845,599	9.28	2015	100,145,920	6.46	-2,430,832	-0.15		
2006	94,266,315	8.28	119,220,681	10.74	2016	108,862,988	6.73	22,651,623	1.41		
2007	94,266,315	9.93	197,642,924	16.37	2017	122,942,180	7.28	175,207,530	11.01		
2008	89,281,830	6.85	-78,966,292	-5.74	2018	123,141,054	6.93	128,188,928	7.41		
							Most recent five-year average return		7.12%		6.67%
							Most recent ten-year average return		5.61%		6.17%
							Most recent 15-year average return		6.25%		6.82%
							Most recent 20-year average return		6.87%		6.04%

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

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, 2009 - 2018



## Administrative Expenses

Administrative expenses for the System are paid by the State.

## 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 members,
- 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 loss from this other experience for the year ended June 30, 2018, amounted to \$54,364,042, which is 2.0% of the actuarial accrued liability.

### EXPERIENCE GAIN/(LOSS) DUE TO CHANGES IN DEMOGRAPHICS FOR YEAR ENDED JUNE 30, 2018

Net turnover	-\$7,931,592
Retirement	-17,048,638
Mortality	-4,854,533
Disability retirements	-491,425
Salary increase for continuing actives	-7,120,663
COLA experience	-726,790
Miscellaneous	<u>-16,190,401</u>
<b>Total</b>	<b>-54,364,042</b>

## **D. Changes in the Actuarial Accrued Liability**

The actuarial accrued liability as of June 30, 2018 is \$2,661,608,857, an increase of \$150,236,402, or 6.0%, from the actuarial accrued liability as of the prior valuation date. The change in liability is due to interest, accumulation and payment of benefits, and actuarial experience (as discussed in the previous subsection).

### **Actuarial Assumptions**

There were no changes in actuarial assumptions since the prior valuation. 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. Development of Unfunded Actuarial Accrued Liability

### DEVELOPMENT OF UNFUNDED ACTUARIAL ACCRUED LIABILITY FOR YEAR ENDED JUNE 30, 2018

<b>1</b>	Unfunded actuarial accrued liability at beginning of year	\$717,577,722
<b>2</b>	Normal cost at beginning of year	49,737,692
<b>3</b>	Total contributions	-105,542,404
<b>4</b>	Interest	
	• For whole year on <b>1 + 2</b>	\$57,548,657
	• For half year on <b>3</b>	<u>-3,957,840</u>
	Total interest	<u>53,590,817</u>
<b>5</b>	Expected unfunded actuarial accrued liability	\$715,363,827
<b>6</b>	Changes due to:	
	• (Gain)/loss	\$64,440,183
	• Assumptions	0
	• Funding method	0
	• Plan provisions	<u>0</u>
	Total changes	<u>64,440,183</u>
<b>7</b>	Unfunded actuarial accrued liability at end of year	<u>\$779,804,010</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. 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, 2018, there are 20 years remaining on this schedule.

The actuarially determined contribution for the fiscal year ending June 30, 2019, is \$62,984,742 as determined with the June 30, 2017, actuarial valuation. The results of this June 30, 2018, actuarial valuation are used to determine the actuarially determined contribution for the fiscal year ending June 30, 2020, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2021, as shown in *Section H*.

The preliminary contribution requirement as of July 1, 2018, 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.

### PRELIMINARY CONTRIBUTION REQUIREMENT

		Year Beginning July 1			
		2018		2017	
		Amount	% of Payroll	Amount	% of Payroll
<b>1</b>	Total normal cost, adjusted for timing*	\$53,942,744	9.91%	\$51,569,137	9.80%
<b>2</b>	Expected employee contributions	<u>-36,950,441</u>	<u>-6.79%</u>	<u>-35,733,223</u>	<u>-6.79%</u>
<b>3</b>	Employer normal cost: <b>1 + 2</b>	\$16,992,203	3.12%	\$15,835,914	3.01%
<b>4</b>	Actuarial accrued liability	2,661,608,857		2,511,372,455	
<b>5</b>	Actuarial value of assets	1,881,804,847		1,793,794,733	
<b>6</b>	Unfunded actuarial accrued liability: <b>4 - 5</b>	779,804,010		717,577,722	
<b>7</b>	Payment on unfunded actuarial accrued liability, adjusted for timing*	50,090,049	9.20%	44,375,782	8.43%
<b>8</b>	Preliminary contribution requirement: <b>3 + 7</b>	<u>\$67,082,352</u>	<u>12.32%</u>	<u>\$60,211,696</u>	<u>11.44%</u>
<b>9</b>	Projected payroll	\$544,379,167		\$526,438,659	

\*Contributions are assumed to be paid at the middle of the year.

\*\*See page 28 for details.

## Reconciliation of Preliminary Contribution Requirement

The chart below details the changes in the preliminary contribution requirement from the prior valuation to the current year's valuation.

### RECONCILIATION OF PRELIMINARY CONTRIBUTION REQUIREMENT FROM JULY 1, 2017 TO JULY 1, 2018

	Amount	% of Payroll
Preliminary contribution requirement as of July 1, 2017	\$60,211,696	11.44%
Effect of:		
• Plan amendment(s)	0	0.00%
• Change in asset method	0	0.00%
• Expected change in amortization payment due to payroll growth	2,218,789	0.41%
• Change in amortization period	0	0.00%
• Change in actuarial assumptions	0	0.00%
• Contributions (more)/less than actuarially determined contribution	-639,605	-0.12%
• Investment (gain)/loss	647,232	0.12%
• Other gains and losses on accrued liability	5,892,417	1.08%
• Net effect of other changes, including composition and number of members, payroll	<u>-1,248,177</u>	-0.61%
Total change	\$6,870,656	0.88%
Preliminary contribution requirement as of July 1, 2018	\$67,082,352	12.32%

## G. Amortization Schedule for Unfunded Actuarial Accrued Liability

A schedule of projected future unfunded actuarial accrued liability payments is shown below.

### UNFUNDED LIABILITY AMORTIZATION SCHEDULE

As of June 30	Balance	Amortization Payment (Year Following)
2018	\$779,804,010	\$50,090,049
2019	786,354,842	61,356,880*
2020	781,715,287	63,197,587
2021	774,819,281	65,093,514
2022	765,440,335	67,046,320
2023	753,333,256	69,057,710
2024	738,232,693	71,129,441
2025	719,851,571	73,263,324
2026	697,879,408	75,461,224
2027	671,980,502	77,725,060
2028	641,791,981	80,056,812
2029	606,921,710	82,458,517
2030	566,946,029	84,932,272
2031	521,407,327	87,480,240
2032	469,811,433	90,104,648
2033	411,624,803	92,807,787
2034	346,271,502	95,592,021
2035	273,129,948	98,459,781
2036	191,529,421	101,413,575
2037	100,746,295	104,455,982
2038	0	0

\* Beginning July 1, 2019 and each year thereafter, the annual payment to amortize the unfunded actuarial liability will be calculated based upon installments increasing at a rate of 3% per year instead of 5%.

## H. Actuarially Determined Contribution for Following Two Fiscal Years

On the basis of the June 30, 2018, actuarial valuation, the employer normal cost rate is 3.12%. This rate is applied to the projected payrolls for fiscal 2020 and fiscal 2021 to determine the employer normal cost for each year. The payment on the unfunded liability is added to the employer normal cost to determine the actuarially determined contribution for the fiscal year ending June 30, 2020, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2021, as shown below. The final actuarially determined contribution for fiscal 2021 will be determined with the next valuation.

### ACTUARIALLY DETERMINED CONTRIBUTION: 2020 – 2021

Fiscal Year Ended June 30	Projected Payroll*	Employer Normal Cost Rate	Projected Contributions		
			Employer Normal Cost	Unfunded Liability	Total
2020	\$563,432,438	3.12%	\$17,587,034	\$61,356,880	\$78,943,914
2021	583,152,573	3.12%	18,202,580	63,197,587	81,400,167

\* In these projections, total payroll is assumed to increase by 3.5% each year.

## I. History of Employer Contributions

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

### HISTORY OF EMPLOYER CONTRIBUTIONS: 2010 – 2019

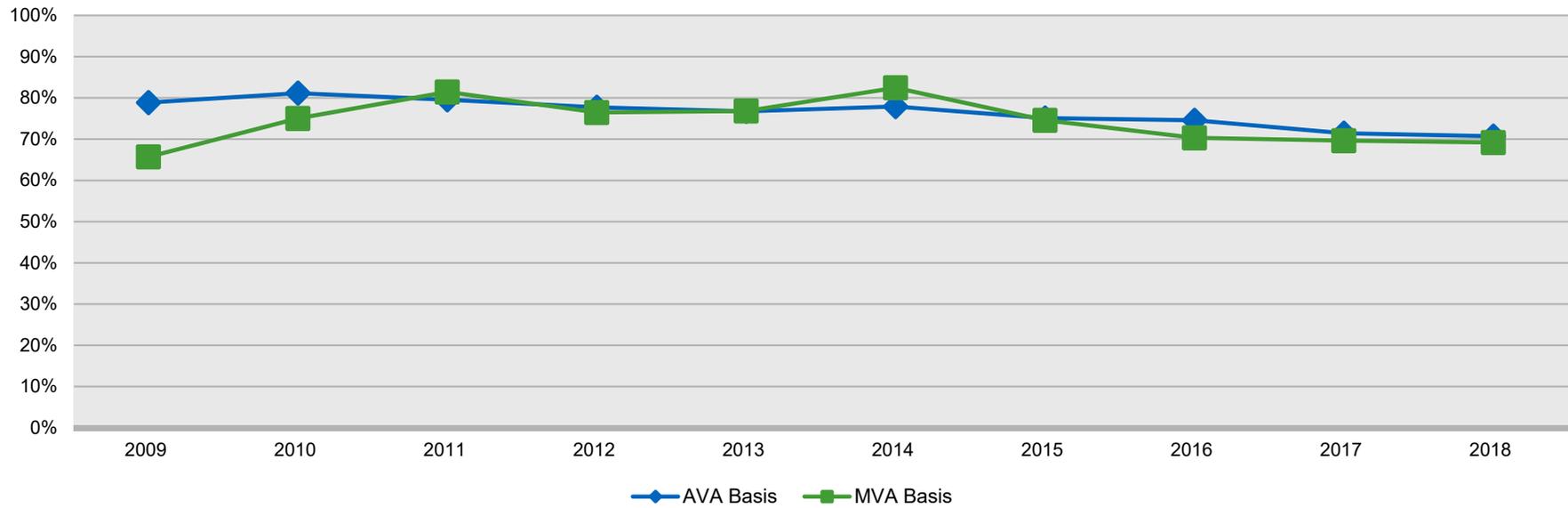
Fiscal Year Ended June 30	Actuarially Determined Employer Contribution		Actual Employer Contribution		Percent Contributed
	Amount*	Percentage of Payroll**	Amount	Percentage of Payroll**	
2010	\$32,013,894	7.57%	\$31,468,884	7.44%	98.30%
2011	41,581,656	9.84%	37,572,599	8.89%	90.36%
2012	36,587,864	8.89%	40,302,433	9.79%	110.15%
2013	37,081,933	8.91%	51,370,307	12.34%	138.53%
2014	40,217,666	9.98%	56,482,985	14.02%	140.44%
2015	44,651,783	10.25%	55,881,364	12.83%	125.15%
2016	46,237,853	10.11%	54,347,060	11.88%	117.54%
2017	48,503,358	10.14%	60,280,480	12.60%	124.28%
2018	52,065,397	10.67%	64,564,323	12.26%	124.01%
2019	62,984,742	11.57%	--	--	--

\* Budgeted contribution amount from prior valuation

\*\*Based on expected payroll

## J. History of Funded Percentage

A history of the most recent years of funded percentage as of July 1<sup>st</sup> is shown below.



## K. 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 members. 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, 2018	June 30, 2017
<b>Liabilities</b>		
• Present value of benefits for retired members and beneficiaries	\$1,586,816,488	\$1,459,055,067
• Present value of benefits for inactive former members	85,635,809	77,279,827
• Present value of benefits for active members	<u>1,416,364,946</u>	<u>1,381,612,843</u>
<b>Total liabilities</b>	<b>\$3,088,817,243</b>	<b>\$2,917,947,737</b>
<b>Assets</b>		
• Total valuation value of assets	\$1,881,804,847	\$1,793,794,733
• Present value of future contributions by members	327,125,611	313,920,542
• Present value of future employer contributions for:		
» Entry age cost	100,082,775	92,654,740
» Unfunded actuarial accrued liability	<u>779,804,010</u>	<u>717,577,722</u>
<b>Total of current and future assets</b>	<b><u>\$3,088,817,243</u></b>	<b><u>\$2,917,947,737</u></b>

## L. Risk

The actuarial valuation results depend on a single set of assumptions; however, there is a risk that emerging results may differ significantly as actual experience proves to be different than projected from the current assumptions.

We have not been engaged to perform a detailed analysis of the potential range of the impact of risks relative to the Plan's future financial condition, but have included a brief discussion of some of the risks that may affect the Plan. This discussion is focused on funding-related risks, but similar concerns may apply to risks regarding the level of expense and liabilities reported for Plan accounting purposes as well.

A more detailed assessment of the risks could provide a better understanding of the risks inherent in the Plan. This assessment may include scenario testing, sensitivity testing, stress testing, and stochastic modeling.

A detailed risk assessment could be important for VSERS because:

- The negative cash flow position of the Plan could be exacerbated by relatively small deviations from assumed future experience.
- Retired and inactive members account for more than half of the Plan's liabilities limiting options for reducing plan liabilities in the event of adverse experience.
- The risks identified below show significant potential for variability.

The following risks could significantly affect the Plan's future condition:

- **Investment Risk** (the risk that returns will be different than expected)

If the prior year's investment performance resulted in a market value of assets that is 10% different than the current value, it would result in a change of \$184.2 million in the asset value. A 10% increase in assets would cause the unfunded liability (market value basis) to decrease from \$820.1 million to \$635.9 million. Likewise, a 10% decrease in the asset value would cause the unfunded liability to increase from \$820.1 million to \$1.004 billion.

Since the Plan's assets are much larger than contributions, investment performance may create volatility in the actuarially determined contribution requirements. For example, for each 1% difference in actual return, the actuarially determined contribution would increase or decrease by 0.20% of payroll, disregarding the effects of the five-year phase-in of investment gains and losses..

To illustrate the potential for future investment volatility, the market value rate of return over the last 20 years has ranged from a low of -18.80% to a high of 21.16%.

➤ **Longevity Risk** (the risk that mortality experience will be different than expected)

The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the actuarially determined contribution.

The current mortality assumptions represent our best estimate of the mortality rates for this plan; however, a 10% reduction in the assumed mortality rates results in an increase in the liabilities of roughly 3% for most plans. For VSERS, a 3% liability increase would result in an increase in the unfunded accrued liability of \$79.9 million. The unfunded accrued liability (market value of assets basis) would increase from \$820.1 million to \$900.0 million.

➤ **Demographic Risk** (the risk that member experience will be different than assumed)

Examples of this risk include:

- Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.
- More or less active member turnover than assumed.
- Salary increases more or less than assumed.

➤ **Actual Experience**

- Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:
  - » The investment gain(loss) for a year (actuarial basis) has ranged from a loss of \$242.5 million to a gain of \$22.6 million.
  - » The non-investment gain(loss) for a year has ranged from a loss of \$83.4 million to a gain of \$2.9 million.
- The funded percentage on the actuarial value of assets has ranged from a low of 70.7% to a high of 81.1% over the past ten years.

➤ **Maturity Measures**

The risk associated with a pension plan increases as it becomes more mature, meaning that the actives represent a smaller portion of the liabilities of the plan. When this happens, there is a greater risk that fluctuations in the experience of the non-active members or of the assets of the plan can result in large swings in the contribution requirements.

- Over the past ten years, the ratio of non-active members to active members has increased from a low of 0.69 to a high of 0.91. Currently the Plan has a non-active to active member ratio of 0.91.
- As of July 1, 2018, the retired life actuarial accrued liability represents 60% of the total actuarial accrued liability. In addition, the actuarial accrued liability for inactive vested members represents 3% of the total. The higher the non-active actuarial accrued liability is as a percent of the total liability, the greater the danger of volatility in results.

- For the prior year, benefits paid were \$28.5 million more than contributions received, or 1.6% of the market value of assets. As the Plan matures, more cash will be needed from the investment portfolio to meet benefit payments.

## Section 3: Supplemental Information

### EXHIBIT A – TABLE OF PLAN COVERAGE

Category	As of July 1		Change From Prior Year
	2018	2017	
<b>Active members in valuation:</b>			
• Number	8,530	8,620	-1.0%
• Average age	45.9	46.0	-0.1
• Average years of creditable service	11.0	11.1	-0.1
• Total payroll	\$521,670,606	\$504,553,289	3.4%
• Average payroll	61,157	58,533	4.5%
• Total active vested members	5,370	5,367	1.0%
<b>Inactive members:</b>			
• Number of deferreds as reported by the System	753	742	1.5%
• Number of inactives as reported by the System	1,266	1,098	15.3%
<b>Retired members:</b>			
• Number in pay status	5,893	5,680	3.8%
• Average age	71.0	70.7	0.3
• Average monthly benefit	\$1,695	\$1,650	2.7%
<b>Disability retirees:</b>			
• Number in pay status	409	412	-0.7%
• Average age	64.8	64.7	0.1
• Average monthly benefit	\$1,203	\$1,146	5.0%
<b>Beneficiaries:</b>			
• Number in pay status	672	635	5.8%
• Average age	69.3	68.3	1.0
• Average monthly benefit	\$1,029	\$987	4.3%

## EXHIBIT B – RECONCILIATION OF MEMBERSHIP DATA

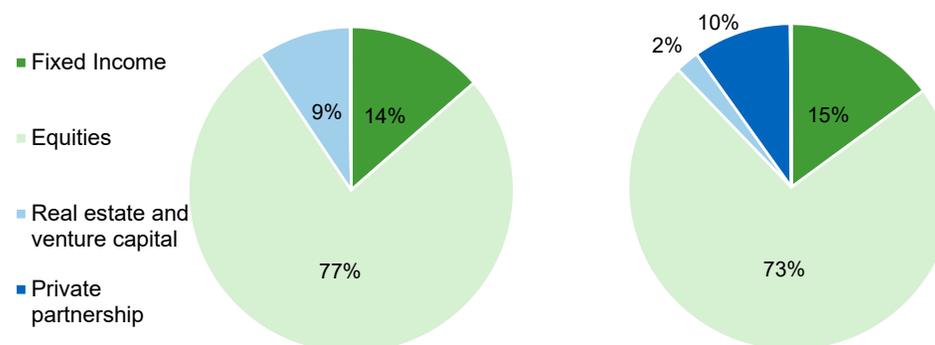
	Active Members	Deferreds	Inactives	Disability Retirees	Retired Members	Beneficiaries	Total
<b>Number as of July 1, 2017</b>	<b>8,620</b>	<b>742</b>	<b>1,098</b>	<b>412</b>	<b>5,680</b>	<b>635</b>	<b>17,187</b>
• New members	753	N/A	126	1	11	9	900
• Inactives as reported by the System	-360	N/A	360	N/A	N/A	N/A	0
• Deferreds as reported by the System	0	68	-68	N/A	N/A	N/A	0
• Retirements	-315	-41	-7	-2	365	N/A	0
• New disabilities	-13	0	-1	17	-3	N/A	0
• Return to work from disability	1	N/A	N/A	-1	N/A	N/A	0
• Died with beneficiary	-2	0	0	-3	-50	55	0
• Died without beneficiary	-13	-5	-1	-16	-108	-21	-164
• Lump sum cash-outs	-166	-7	-216	0	0	0	-389
• Rehire	29	-4	-25	N/A	N/A	N/A	0
• Certain period expired	N/A	N/A	0	0	-1	-5	-6
• Data adjustments	-4	0	1	1	-1	-1	-4
<b>Number as of July 1, 2018</b>	<b>8,530</b>	<b>753</b>	<b>1,267</b>	<b>409</b>	<b>5,893</b>	<b>672</b>	<b>17,524</b>

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

	Year Ended June 30, 2018	Year Ended June 30, 2017
Net assets at market value at the beginning of the year	\$1,748,442,294	\$1,609,650,152
<b>Contribution income:</b>		
• Employer contributions	\$64,564,323	\$60,280,480
• Member contributions	40,423,239	35,966,987
• Less administrative expenses	<u>-2,026,240</u>	<u>-2,119,044</u>
<i>Net contribution income</i>	<i>\$102,961,322</i>	<i>\$94,128,423</i>
Net other income	\$554,842	\$785,504
<b>Investment income:</b>		
• Interest, dividends and other income	\$23,473,589	\$25,832,143
• Asset appreciation	104,715,339	149,375,387
• Less investment fees	<u>-4,556,759</u>	<u>-4,849,514</u>
<i>Net investment income</i>	<i><u>\$123,632,169</u></i>	<i><u>\$170,358,016</u></i>
<b>Total income available for benefits</b>	<b>\$227,148,333</b>	<b>\$265,271,943</b>
<b>Less benefit payments:</b>		
• Benefits	-\$129,699,506	-\$122,139,440
• Refunds of contributions	-3,172,033	-3,640,086
• Death claims	-693,500	-392,819
• Transfers to other pension trust funds	<u>-525,305</u>	<u>-307,456</u>
<i>Net benefit payments</i>	<i>-\$134,090,344</i>	<i>-\$126,479,801</i>
<b>Change in reserve for future benefits</b>	<b>\$93,057,989</b>	<b>\$138,792,142</b>
<b>Net assets at market value at the end of the year</b>	<b>\$1,841,500,283</b>	<b>\$1,748,442,294</b>

## EXHIBIT D – SUMMARY STATEMENT OF PLAN ASSETS

	June 30 , 2018	June 30, 2017
Cash equivalents	\$11,677,231	\$54,322,860
Total accounts receivable	71,880,568	95,264,034
Prepaid expenses	42,957	37,519
Capital assets, net of depreciation	1,539,288	1,838,117
<b>Investments:</b>		
• Fixed Income	\$250,284,237	\$256,421,944
• Equities	275,418,951	316,808,823
• Private partnerships	0	167,474,960
• Mutual and commingled funds	1,143,801,623	933,509,690
• Real estate and venture capital	<u>171,489,045</u>	<u>40,319,231</u>
Total investments at market value	\$1,840,993,856	\$1,714,534,648
Total assets	\$1,926,133,900	\$1,865,997,178
Total liabilities	-\$84,633,617	-\$117,554,884
<b>Net assets at market value</b>	<b>\$1,841,500,283</b>	<b>\$1,748,442,294</b>
<b>Net assets at actuarial value</b>	<b>\$1,881,804,847</b>	<b>\$1,793,792,981</b>



## EXHIBIT E – DEVELOPMENT OF THE FUND THROUGH JUNE 30, 2018

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
2008							\$1,282,493,872	\$1,377,101,471	107.38%
2009	\$25,134,235	\$22,148,754	\$1,041,870	-\$242,976,382	-\$1,219,287	-\$71,925,080	1,014,697,982	1,217,637,578	120.00%
2010	31,468,884	22,840,354	227,524	182,593,261	-891,477	-81,091,626	1,169,844,902	1,265,404,195	108.17%
2011	37,572,599	22,269,041	743,172	238,386,383	-1,147,576	-87,061,787	1,380,606,734	1,348,762,790	97.69%
2012	40,302,433	27,708,009	377,562	23,604,774	-1,328,919	-92,781,097	1,378,489,496	1,400,779,062	101.62%
2013	51,370,307	29,847,352	638,436	110,717,567	-1,374,643	-99,194,618	1,470,493,897	1,469,169,902	99.91%
2014	56,482,985	31,745,692	453,852	203,720,178	-1,158,183	-104,492,553	1,657,245,868	1,566,075,540	94.50%
2015	55,881,364	33,296,248	423,273	-8,484,694	-2,104,636	-111,396,184	1,624,861,239	1,636,267,663	100.70%
2016	54,347,060	34,055,217	293,444	17,962,425	-1,775,647	-120,093,586	1,609,650,152	1,707,267,941	106.06%
2017	60,280,480	35,966,987	785,504	170,358,016	-2,119,044	-126,479,801	1,748,442,294	1,793,794,733	102.59%
2018	64,564,323	40,423,239	554,842	123,932,169	-2,026,240	-134,090,344	1,841,500,283	1,881,804,847	102.19%

\* On a market basis, net of investment fees

\*\* Includes "other expenses"

## 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> <p>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)</p> <p>Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and</p> <p>Discounted according to an assumed rate (or rates) of return to reflect the time value of money.</p>

<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 percentage 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 Percentage:</b>	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes calculate a market funded percentage, 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 October 29, 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. The next Actuarial Experience study will be performed in 2020 for the July 1, 2021 valuation.																			
<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>	<table border="1"> <thead> <tr> <th data-bbox="632 907 716 1016">Age</th> <th data-bbox="716 907 1094 1016">Annual Rate of Salary Increase (%)</th> </tr> </thead> <tbody> <tr> <td data-bbox="632 1016 716 1062">25</td> <td data-bbox="716 1016 1094 1062">6.21%</td> </tr> <tr> <td data-bbox="632 1062 716 1107">30</td> <td data-bbox="716 1062 1094 1107">5.66%</td> </tr> <tr> <td data-bbox="632 1107 716 1153">35</td> <td data-bbox="716 1107 1094 1153">5.26%</td> </tr> <tr> <td data-bbox="632 1153 716 1198">40</td> <td data-bbox="716 1153 1094 1198">4.92%</td> </tr> <tr> <td data-bbox="632 1198 716 1243">45</td> <td data-bbox="716 1198 1094 1243">4.36%</td> </tr> <tr> <td data-bbox="632 1243 716 1289">50</td> <td data-bbox="716 1243 1094 1289">3.70%</td> </tr> <tr> <td data-bbox="632 1289 716 1334">55</td> <td data-bbox="716 1289 1094 1334">3.50%</td> </tr> <tr> <td data-bbox="632 1334 716 1380">60</td> <td data-bbox="716 1334 1094 1380">3.50%</td> </tr> </tbody> </table>		Age	Annual Rate of Salary Increase (%)	25	6.21%	30	5.66%	35	5.26%	40	4.92%	45	4.36%	50	3.70%	55	3.50%	60	3.50%
Age	Annual Rate of Salary Increase (%)																			
25	6.21%																			
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35	5.26%																			
40	4.92%																			
45	4.36%																			
50	3.70%																			
55	3.50%																			
60	3.50%																			

**Cost-of-Living Adjustments:**

Assumed to occur at the rate of 2.55% per annum for Groups A, C and D members and 1.40% per annum for Group F members (beginning at age 62 for deferred retirements). For Group F members retiring after July 1, 2008, cost-of-living adjustments are assumed to occur at the rate of 2.55% per annum effective January 1, 2014. The January 1, 2019 COLA is assumed to be 1.30% for those in group E and F who retired before June 30, 2008, and 2.60% for all other groups..

**Mortality Rates:***Death in Active Service:*

- Groups A/F 101% of RP-2006 blended 30% Blue Collar Employee, 70% Healthy Employee with generational projection using Scale SSA-2017.
- Group C RP-2006 Blue Collar Employee with generational projection using Scale SSA-2017.
- Group D\* RP-2006 Healthy Employee with generational projection using Scale SSA-2017.

*Healthy Post-retirement:*

- Groups A/F 101% of RP-2006 blended 30% Blue Collar Annuitant, 70% Healthy Annuitant with generational projection using Scale SSA-2017.
- Group C RP-2006 Blue Collar Annuitant with generational projection using Scale SSA-2017.
- Group D RP-2006 Healthy Annuitant with generational projection using Scale SSA-2017.

*Disabled Post-retirement:*

- All Groups RP-2006 Disabled Mortality Table with generational projection using Scale SSA-2017.

The tables with the generational projection to the ages of members 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

\* 30% of deaths are assumed to be accidental.

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

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

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

Age	Rate (%)				
	Withdrawal <sup>1</sup>			Disability	
	Groups A/D/F	Group C		Groups A/D/F	Group C
	Male/Female	Male	Female		
25	4.91%	4.32%	8.64%	0.02%	0.08%
30	3.93	4.32	8.64	0.02	0.10
35	3.28	4.32	8.64	0.03	0.13
40	3.04	4.32	8.64	0.04	0.20
45	2.69	4.32	8.64	0.06	0.32
50	2.25	4.32	8.64	0.10	0.55
55	1.83	4.32	8.64	0.18	0.91
60	3.90	4.32	8.64	0.28	1.46

<sup>1</sup> Withdrawal rates are increased during the first 10 years of service for Groups C and F. For Group C, no withdrawals is assumed after a member has attained 20 years of service. For Group D, no withdrawal is assumed after a member has reached age 55.

**Retirement Rates:**

Age	Retirement Group F <sup>2</sup>				
	Male	Female	Age	Male	Female
50	16.0%	6.0%	60	5.6%	5.6%
51	16.0	8.0	61	11.2	11.2
52	8.0	9.0	62	22.4	22.4
53	8.0	9.0	63	17.5	14.0
54	8.0	10.0	64	17.5	14.0
55	4.0	5.0	65	25.0	20.0
56	3.4	4.2	66	15.0	15.0
57	4.5	5.6	67	17.5	17.5
58	5.0	6.3	68	17.5	17.5
59	5.6	5.6	69	20.0	20.0
			70	100.0	100.0

<sup>2</sup> All Group A, C, and D members are assumed to retire when first eligible.

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

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

Valuation liability equals 250% of accumulated contributions.

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

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

**Future Administrative Expenses:**

No provisions made; expenses of the System are paid by the State.

**Unknown Data for Members:**

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

**Percent Married:**

- Groups A/D 75.4% of male members and 64.0% of female members are assumed to be married.
- Group C 73.3% of male members and 61.0% of female members are assumed to be married.
- Group F 71.4% of male members and 63.1% of female members are assumed to be married.

<b>Age of Spouse:</b>	Females three years younger than males.
<b>Benefit Elections:</b>	<ul style="list-style-type: none"> <li>• Non-Group C All members are assumed to elect the single life annuity option.</li> <li>• Group C Single members are assumed to elect single life annuity. Married members are assumed to elect the 70% joint &amp; survivor option</li> </ul>
<b>Actuarial Value of Assets:</b>	The amount of the assets for valuation purposes equals the preliminary asset value plus 20% of the difference between market and preliminary asset values. The preliminary asset value is equal to the previous year's asset value (for valuation purposes) adjusted for contributions less benefit payments and expenses plus expected investment income. If necessary, a further adjustment is made to ensure that the valuation assets are within 20% of the market value.
<b>Actuarial Cost Method:</b>	Entry Age Actuarial Cost Method. Entry Age is the age at date of employment or, if date is unknown, current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary, with Normal Cost determined using the plan of benefits applicable to each member.
<b>Changes in Actuarial Assumptions:</b>	There were no changes in actuarial assumptions since the prior valuation.

## 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, 1972 (for consolidated system).
<b>Creditable Service:</b>	Service as a member plus purchased service.
<b>Average Final Compensation (AFC):</b>	<ul style="list-style-type: none"> <li>• Groups A/F Average annual compensation during highest 3 consecutive years.</li> <li>• Group C Average annual compensation during highest 2 consecutive years.</li> <li>• Group D Annual compensation at retirement.</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 for members hired after July 1, 2004, and age 62 with 20 years of service.</li> <li>• Group C Age 55.</li> <li>• Group D Age 62 with 5 years of service.</li> <li>• Group F Age 62 or 30 years of service. For members hired after June 30, 2008, age 65 or a sum of age plus service greater than or equal to 87.</li> </ul>
<b>Normal Retirement – Amount:</b>	<ul style="list-style-type: none"> <li>• Group A 1.67% of AFC times service.</li> <li>• Group C 2.50% of AFC times service up to 20 years.</li> <li>• Group D 3.33% of AFC times service up to 30 years.</li> <li>• Group F 1.25% of AFC times service prior to January 1, 1991, plus 1.67% of AFC times service after 1990, up to a maximum benefit of 50% of AFC. For members hired on or after July 1, 2008, the maximum benefit is 60% of AFC.</li> </ul>
<b>Early Retirement – Eligibility:</b>	<ul style="list-style-type: none"> <li>• Groups A/D Age 55 with 5 years of service or 30 years of service.</li> <li>• Group C Age 50 with 20 years of service.</li> <li>• Group F Age 55 with 5 years of service.</li> </ul>
<b>Early Retirement – Amount:</b>	<ul style="list-style-type: none"> <li>• Group A Actuarial equivalent of normal retirement allowance. For members with 30 years of service, there is no reduction.</li> <li>• Group C Same as normal retirement allowance.</li> <li>• Group D Normal allowance reduced by 3% for each year commencement precedes age 62.</li> <li>• Group F For members hired prior to July 1, 2008, no reduction if 30 years of service; otherwise normal allowance reduced by 6% for each year commencement precedes age 62. For members</li> </ul>

hired on or after July 1, 2008, no reduction if combination of years and service equal 87; other reduced from age 65 based on the following table:

Years of Service	Reduction in Benefit
35	One-eighth of 1% per year
30	One-fourth of 1% per year
25	One-third of 1% per year
20	Five-twelfths of 1% per year
Less than 20	Five-ninths of 1% per year

<b>Vesting:</b>	<ul style="list-style-type: none"> <li>All groups – 5 years of service.</li> <li>Allowance beginning at normal retirement age based on AFC and service at termination.</li> </ul>
<b>Ordinary Disability – Eligibility:</b>	<ul style="list-style-type: none"> <li>All groups – 5 years of service and incapacitated, not work related, for performance of duty.</li> </ul>
<b>Ordinary Disability – Amount:</b>	<ul style="list-style-type: none"> <li>All groups – Immediate allowance based on service to date of disability. Benefit is the greatest of 25% of AFC and unreduced accrued benefit as of date of disability.</li> </ul>
<b>Accidental Disability – Eligibility:</b>	<ul style="list-style-type: none"> <li>All groups – Incapacitated because of work related accident.</li> </ul>
<b>Accidental Disability – Amount:</b>	<ul style="list-style-type: none"> <li>Groups A/D/F Immediate allowance based on service projected to normal retirement. Benefit is the greater of 25% of AFC and unreduced accrued benefit as of date of disability.</li> <li>Group C Immediate allowance equal to 50% of AFC with additional 10% of AFC for each dependent child (up to 30%).</li> </ul>
<b>Ordinary Death – Eligibility:</b>	<ul style="list-style-type: none"> <li>Groups A/F Death after eligibility for early retirement or 10 years of service.</li> <li>Groups C/D Death after normal retirement age or 10 years of service.</li> </ul>
<b>Ordinary Death – Amount:</b>	<ul style="list-style-type: none"> <li>Groups A/D/F Maximum of reduced allowance under 100% survivor option and disability allowance under 100% disability survivor option, commencing immediately.</li> <li>Group C 70% of the allowance that would have been payable to the member plus additional allowance equal to 10% of AFC for each dependent child (up to 30%).</li> </ul>
<b>Accidental Death – Eligibility:</b>	<ul style="list-style-type: none"> <li>All groups – Death because of work related accident.</li> </ul>
<b>Accidental Death – Amount:</b>	<ul style="list-style-type: none"> <li>Groups A/D/F Allowance equal to 25% of AFC payable to spouse.</li> <li>Group C Allowance equal to 35% of AFC payable to spouse plus 10% for each dependent child (up to 30%).</li> </ul>

<b>Post-Retirement Adjustments:</b>	<ul style="list-style-type: none"> <li>• Groups A/C/D Allowances in payment for at least one year increased on each January 1 by the percentage increase in Consumer Price Index, but not more than 5%.</li> <li>• Group F Same, but increase is based on half of the Consumer Price Index increase. Increase is based on the full Consumer Price Index increase starting in 2014 for employees retiring after July 1, 2008.</li> </ul>
<b>Optional Benefit and Death after Retirement:</b>	Lifetime allowance or actuarially equivalent allowance with survivor benefit as elected by member upon retirement. Upon death of a Group C member, an allowance equal to 70% of the member's allowance is continue to the surviving spouse.
<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>• Groups A/D/F 6.65%.</li> <li>• Group C 8.53%.</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 – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2018  
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	245	243	2	--	--	--	--	--	--
	\$50,334	\$34,396	\$49,082	--	--	--	--	--	--
25 - 29	744	640	102	2	--	--	--	--	--
	\$48,249	46,015	\$62,110	\$55,962	--	--	--	--	--
30 - 34	933	554	291	87	1	--	--	--	--
	\$52,949	46,596	\$62,721	\$60,793	\$46,301	--	--	--	--
35 - 39	1,013	448	282	231	51	1	--	--	--
	\$58,224	49,460	\$62,208	\$67,710	\$70,076	\$65,832	--	--	--
40 - 44	965	309	193	229	187	47	--	--	--
	\$63,801	50,364	\$63,768	\$69,367	\$75,968	\$76,759	--	--	--
45 - 49	1,211	307	192	229	227	173	80	3	--
	\$65,783	50,920	\$60,544	\$68,079	\$75,270	\$78,083	\$75,187	\$68,898	--
50 - 54	1,148	265	160	190	185	138	128	75	7
	\$65,171	50,070	\$63,382	\$65,613	\$70,686	\$72,878	\$77,120	\$73,040	\$65,246
55 - 59	1,098	220	153	187	174	110	109	88	57
	\$65,716	53,007	\$61,744	\$64,900	\$66,497	\$72,309	\$78,627	\$76,448	\$71,747
60 - 64	822	127	116	125	140	81	87	55	91
	\$67,733	55,965	\$65,064	\$66,206	\$70,268	\$67,675	\$73,184	\$75,826	\$75,703
65 & over	351	47	46	60	51	27	27	28	65
	\$71,378	60,211	\$62,452	\$68,992	\$63,596	\$71,119	\$81,363	\$80,421	\$86,141
<b>Total</b>	<b>8,530</b>	<b>3,160</b>	<b>1,537</b>	<b>1,340</b>	<b>1,016</b>	<b>577</b>	<b>431</b>	<b>249</b>	<b>220</b>
	\$61,157	\$48,052	\$62,568	\$66,817	\$71,497	\$73,821	\$76,614	\$75,640	\$77,429

**TABLE 1B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2018  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**General Employees – Group A**

Age	Years of Creditable Service								
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	--	--	--	--	--	--	--	--	--
25 - 29	--	--	--	--	--	--	--	--	--
30 - 34	--	--	--	--	--	--	--	--	--
35 - 39	--	--	--	--	--	--	--	--	--
40 - 44	--	--	--	--	--	--	--	--	--
45 - 49	--	--	--	--	--	--	--	--	--
50 - 54	1	--	--	--	--	--	--	1	--
	\$76,532	--	--	--	--	--	--	\$76,532	--
55 - 59	--	--	--	--	--	--	--	--	--
60 - 64	1	--	--	--	--	--	--	--	1
	\$115,937	--	--	--	--	--	--	--	\$115,937
65 & over	1	--	--	--	--	--	--	--	1
	\$58,286	--	--	--	--	--	--	--	\$58,286
<b>Total</b>	<b>3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>1</b>	<b>2</b>
	<b>\$83,585</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>\$76,532</b>	<b>\$87,112</b>

**TABLE 1C – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2018  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**Law Enforcement Personnel – Group C**

Age	Years of Creditable Service								
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	25	25	--	--	--	--	--	--	--
	\$49,562	\$49,562	--	--	--	--	--	--	--
25 - 29	69	49	20	--	--	--	--	--	--
	\$72,628	\$68,584	\$82,536	--	--	--	--	--	--
30 - 34	78	25	41	12	--	--	--	--	--
	\$72,844	\$61,560	\$81,138	\$68,015	--	--	--	--	--
35 - 39	65	7	22	33	3	--	--	--	--
	\$82,522	\$59,885	\$77,517	\$88,637	\$104,772	--	--	--	--
40 - 44	79	5	9	26	30	9	--	--	--
	\$94,530	\$65,398	\$81,341	\$84,716	\$105,657	\$115,163	--	--	--
45 - 49	100	3	5	20	38	25	9	--	--
	\$98,152	\$40,607	\$69,358	\$93,427	\$100,394	\$104,176	\$117,632	--	--
50 - 54	38	1	5	6	12	6	6	2	--
	\$89,984	\$79,187	\$65,291	\$80,337	\$97,489	\$92,726	\$113,826	\$61,271	--
55 - 59	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
60 - 64	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
65 & over	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
Total	454	115	102	97	83	40	15	2	--
	\$83,697	\$61,616	\$79,295	\$85,509	\$102,034	\$104,930	\$116,110	\$61,271	--

**TABLE 1D – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2018  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**Judges – Group D**

Age	Years of Creditable Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over	
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
30 - 34	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
35 - 39	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
40 - 44	1	1	--	--	--	--	--	--	--	--
	\$124,995	\$124,995	--	--	--	--	--	--	--	--
45 - 49	1	--	1	--	--	--	--	--	--	--
	\$150,296	--	\$150,296	--	--	--	--	--	--	--
50 - 54	11	3	5	2	--	1	--	--	--	--
	\$145,187	\$128,965	\$151,856	\$150,296	--	\$150,296	--	--	--	--
55 - 59	5	1	--	1	1	1	1	--	--	--
	\$124,648	\$150,296	--	\$41,354	\$158,094	\$123,202	\$150,296	--	--	--
60 - 64	13	5	2	4	2	--	--	--	--	--
	\$142,813	\$129,281	\$150,296	\$152,246	\$150,296	--	--	--	--	--
65 & over	10	1	5	6	2	1	1	2	--	--
	\$100,860	\$371	\$94,905	\$103,972	\$55,022	\$106,205	\$150,296	\$108,123	--	--
<b>Total</b>	<b>50</b>	<b>11</b>	<b>13</b>	<b>13</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>
	\$123,836	\$118,997	\$129,592	\$121,135	\$113,746	\$126,568	\$150,296	\$108,123	\$158,094	

**TABLE 1E – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2018  
BY AGE, YEARS OF CREDITABLE SERVICE, AND AVERAGE PAYROLL**

**General Employees – Group F**

Age	Years of Creditable Service								
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35 & over
Under 25	220	218	2	--	--	--	--	--	--
	\$32,806	\$32,657	\$49,083	--	--	--	--	--	--
25 - 29	675	591	82	2	--	--	--	--	--
	\$45,757	\$44,144	\$57,129	\$55,962	--	--	--	--	--
30 - 34	855	529	250	75	1	--	--	--	--
	\$51,134	\$45,889	\$59,700	\$59,638	\$46,301	--	--	--	--
35 - 39	948	441	260	198	48	1	--	--	--
	\$56,558	\$49,294	\$60,913	\$64,222	\$67,907	\$65,832	--	--	--
40 - 44	885	303	184	203	157	38	--	--	--
	\$60,989	\$49,869	\$62,908	\$67,401	\$70,295	\$67,663	--	--	--
45 - 49	1,110	304	186	209	189	148	71	3	--
	\$62,791	\$51,022	\$59,824	\$65,653	\$70,218	\$73,675	\$69,807	\$68,898	--
50 - 54	1,098	261	150	182	173	131	122	73	6
	\$63,500	\$49,052	\$60,370	\$64,197	\$68,826	\$71,378	\$75,315	\$73,362	\$63,365
55 - 59	1,093	219	153	186	173	109	108	88	57
	\$65,447	\$52,563	\$61,744	\$65,027	\$65,968	\$71,842	\$77,963	\$76,448	\$71,747
60 - 64	809	122	114	121	138	81	87	55	91
	\$66,526	\$52,960	\$63,568	\$63,362	\$69,108	\$67,675	\$73,184	\$75,826	\$75,703
65 & over	330	46	41	54	49	26	26	26	62
	\$69,817	\$61,512	\$58,494	\$65,106	\$63,946	\$69,769	\$78,712	\$78,290	\$84,949
Total	8,023	1,422	1,230	928	534	414	245	216	8,023
	\$59,483	\$60,756	\$64,769	\$68,538	\$71,195	\$74,827	\$75,492	\$76,970	\$59,483

**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	1	\$35,903	65	\$415,728
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	2	20,301	0	0
39	0	0	0	0	1	7,335
40	0	0	0	0	0	0
41	0	0	2	62,587	1	5,399
42	1	20,383	2	23,978	0	0
43	0	0	0	0	1	9,649
44	0	0	1	8,301	0	0
45	1	10,109	2	36,997	1	8,090
46	2	56,619	3	68,073	3	31,895
47	2	60,264	3	75,375	1	22,715
48	3	73,184	5	66,449	2	35,513
49	5	167,566	3	42,829	4	36,861
50	15	782,076	10	226,497	1	7,526
51	19	872,758	3	77,895	2	27,109
52	29	1,308,218	6	188,412	0	0
53	29	1,073,261	10	178,628	3	43,098
54	36	1,393,726	9	152,200	5	87,209
55	49	1,710,351	11	180,795	1	11,161
56	66	1,876,449	17	264,668	6	59,653
57	59	1,631,664	16	236,479	2	43,580
58	76	2,315,634	8	137,753	6	63,559
59	87	2,155,505	13	164,221	3	34,089
60	98	2,822,285	18	276,416	15	257,418
61	123	3,648,054	13	187,318	8	122,401
62	208	3,998,355	10	169,890	14	205,551
63	233	5,242,439	19	283,725	17	233,649
64	262	5,247,801	15	136,345	18	286,938
65	275	5,781,836	21	302,654	14	227,478

**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	306	\$5,899,903	26	\$276,165	7	\$97,841
67	313	6,605,851	17	234,940	17	193,662
68	340	6,870,667	15	194,909	16	222,058
69	318	6,275,304	16	216,378	11	140,414
70	344	6,574,102	12	117,614	19	289,251
71	335	6,996,599	10	219,380	21	256,489
72	215	4,443,420	10	122,549	16	223,272
73	219	4,013,806	7	85,904	22	276,990
74	195	3,579,842	11	157,386	25	359,016
75	217	4,261,422	6	67,887	25	356,973
76	171	3,303,633	7	62,237	25	335,376
77	136	2,149,353	8	136,603	22	298,989
78	138	2,219,664	8	113,450	20	252,602
79	111	1,683,145	3	17,337	22	271,807
80	93	1,456,312	8	102,290	12	148,802
81	88	1,509,039	6	48,689	16	178,690
82	109	1,809,137	3	21,754	28	416,480
83	80	1,404,269	4	42,614	25	317,194
84	74	1,090,599	1	8,601	18	217,133
85	75	1,017,077	2	12,194	12	104,317
86	52	700,782	1	5,393	15	164,168
87	64	867,478	1	4,802	16	176,319
88	50	697,397	1	6,380	16	196,538
89	40	481,367	0	0	10	119,807
90	26	446,654	2	17,320	16	160,456
91	23	363,770	1	7,881	4	29,037
92	25	311,736	0	0	6	37,164
93	21	185,602	0	0	4	35,883
94	7	100,780	0	0	4	22,482
≥ 95	30	299,007	0	0	8	119,002
Total	5,893	\$119,866,260	409	\$5,905,347	672	\$8,301,816

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

**General Employees – Group A**

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	0	0	0	0	0	0
53	0	0	0	0	0	0
54	0	0	0	0	0	0
55	0	0	0	0	0	0
56	1	8,661	0	0	0	0
57	0	0	0	0	0	0
58	0	0	0	0	0	0
59	0	0	0	0	0	0
60	2	83,432	0	0	1	7,010
61	0	0	0	0	0	0
62	0	0	0	0	0	0
63	2	55,007	1	5,572	0	0
64	0	0	1	1,835	0	0
65	2	20,926	1	16,929	1	9,226

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

**General Employees – Group A (Continued)**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	5	\$109,134	1	\$7,957	0	\$0
67	3	76,815	0	0	0	0
68	3	78,480	0	0	0	0
69	3	81,124	1	21,192	1	12,462
70	5	127,415	1	7,848	1	23,412
71	4	106,945	0	0	1	38,652
72	7	200,951	0	0	0	0
73	0	0	0	0	2	18,903
74	3	90,842	0	0	2	19,834
75	0	0	0	0	1	15,119
76	6	192,783	0	0	2	25,173
77	4	98,130	0	0	3	38,744
78	2	45,165	0	0	0	0
79	6	177,812	0	0	0	0
80	4	97,875	1	12,139	0	0
81	6	123,268	0	0	0	0
82	3	79,259	0	0	1	20,635
83	8	236,605	0	0	0	0
84	4	94,576	0	0	0	0
85	3	83,212	0	0	0	0
86	3	69,793	0	0	2	21,536
87	4	109,011	0	0	3	37,011
88	5	92,534	0	0	1	4,166
89	2	42,364	0	0	1	13,161
90	2	55,338	1	12,328	3	31,404
91	1	7,416	1	7,881	1	8,768
92	3	46,966	0	0	5	33,373
93	1	11,749	0	0	0	0
94	1	18,437	0	0	1	3,409
≥ 95	4	42,558	0	0	4	24,701
<b>Total</b>	<b>112</b>	<b>\$2,764,579</b>	<b>9</b>	<b>\$93,681</b>	<b>37</b>	<b>\$406,700</b>

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

### State Police and Motor Vehicle Inspectors – Group B

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	0	0	0	0	0	0
53	0	0	0	0	1	20,229
54	0	0	0	0	0	0
55	0	0	0	0	0	0
56	0	0	0	0	0	0
57	0	0	0	0	0	0
58	0	0	0	0	0	0
59	0	0	0	0	0	0
60	1	11,426	0	0	0	0
61	0	0	0	0	0	0
62	1	9,042	0	0	0	0
63	0	0	0	0	0	0
64	1	9,816	0	0	0	0
65	0	0	0	0	0	0

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

### State Police and Motor Vehicle Inspectors – Group B (Continued)

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	0	\$0	0	\$0	0	\$0
67	1	4,996	0	0	0	0
68	0	0	0	0	0	0
69	0	0	1	21,033	0	0
70	0	0	0	0	1	13,222
71	1	38,461	0	0	0	0
72	2	66,530	0	0	0	0
73	0	0	0	0	1	7,215
74	0	0	1	21,955	0	0
75	1	9,061	0	0	1	17,367
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
<b>Total</b>	<b>8</b>	<b>\$149,332</b>	<b>2</b>	<b>\$42,988</b>	<b>4</b>	<b>\$58,034</b>

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

**Law Enforcement Personnel – Group C**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤ 35	0	\$0	1	\$35,903	25	\$209,146
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	1	51,472	0	0
42	1	20,383	0	0	0	0
43	0	0	0	0	0	0
44	0	0	0	0	0	0
45	0	0	1	31,404	0	0
46	0	0	2	58,023	1	12,357
47	0	0	1	47,875	0	0
48	1	17,986	0	0	0	0
49	0	0	0	0	1	13,013
50	12	709,138	2	96,306	0	0
51	9	588,101	1	45,600	0	0
52	14	806,100	3	156,691	0	0
53	14	648,335	1	49,733	0	0
54	10	548,538	1	16,289	1	23,860
55	12	739,763	1	26,433	0	0
56	13	473,844	0	0	0	0
57	7	350,545	2	79,703	0	0
58	19	933,704	0	0	0	0
59	14	596,643	0	0	0	0
60	15	915,469	1	36,882	1	20,719
61	19	1,113,097	0	0	1	28,498
62	15	616,107	0	0	1	36,352
63	17	821,155	0	0	1	23,004
64	7	294,670	0	0	1	31,562
65	13	617,078	2	74,821	2	43,552

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

**Law Enforcement Personnel – Group C (Continued)**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	9	\$363,764	0	\$0	1	\$11,934
67	5	248,420	0	0	1	30,795
68	13	553,779	1	35,667	1	16,489
69	4	145,136	1	31,347	1	24,588
70	9	346,207	0	0	2	68,565
71	12	558,728	3	120,843	2	44,833
72	10	435,595	1	43,444	1	31,599
73	1	27,823	1	34,952	0	0
74	5	192,852	1	33,513	3	87,855
75	10	473,124	0	0	2	64,767
76	6	284,401	0	0	1	28,792
77	5	192,030	0	0	3	84,147
78	4	178,478	1	30,303	2	59,033
79	2	94,107	0	0	2	49,661
80	2	89,964	1	29,015	2	36,984
81	3	151,421	0	0	2	51,970
82	2	75,488	0	0	3	111,480
83	3	143,495	0	0	3	88,038
84	0	0	0	0	2	63,875
85	1	49,206	0	0	2	57,778
86	2	91,768	0	0	1	31,015
87	4	142,319	0	0	1	31,575
88	2	91,564	0	0	4	84,971
89	3	101,762	0	0	0	0
90	0	0	0	0	1	27,511
91	1	43,547	0	0	0	0
92	0	0	0	0	0	0
93	0	0	0	0	1	16,442
94	0	0	0	0	0	0
≥ 95	0	0	0	0	0	0
<b>Total</b>	<b>330</b>	<b>\$15,885,633</b>	<b>30</b>	<b>\$1,166,219</b>	<b>79</b>	<b>\$1,646,758</b>

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

**Judges – 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	0	0	0	0	0	0
53	0	0	0	0	0	0
54	0	0	0	0	1	11,374
55	0	0	0	0	0	0
56	0	0	0	0	0	0
57	0	0	0	0	0	0
58	1	88,543	0	0	0	0
59	0	0	0	0	0	0
60	1	26,299	0	0	0	0
61	0	0	0	0	0	0
62	0	0	0	0	0	0
63	4	280,423	0	0	0	0
64	2	157,545	0	0	0	0
65	4	267,259	0	0	0	0

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

Judges – Group D (Continued)

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	1	\$67,165	0	\$0	0	\$0
67	3	255,455	0	0	0	0
68	3	257,471	0	0	0	0
69	5	332,116	0	0	0	0
70	2	203,739	0	0	0	0
71	2	188,501	0	0	0	0
72	2	45,332	0	0	1	27,084
73	1	17,032	0	0	1	20,246
74	2	155,489	0	0	0	0
75	5	344,764	0	0	0	0
76	3	258,281	0	0	0	0
77	0	0	0	0	0	0
78	1	76,786	0	0	0	0
79	1	36,020	0	0	0	0
80	1	82,201	0	0	0	0
81	3	175,426	0	0	0	0
82	2	151,553	0	0	1	33,794
83	1	101,599	0	0	1	65,187
84	0	0	0	0	0	0
85	1	98,260	0	0	0	0
86	2	66,422	0	0	0	0
87	0	0	0	0	0	0
88	1	40,344	0	0	1	29,346
89	0	0	0	0	1	67,972
90	2	140,475	0	0	0	0
91	1	71,153	0	0	0	0
92	0	0	0	0	0	0
93	1	17,332	0	0	0	0
94	1	10,212	0	0	0	0
≥ 95	1	58,770	0	0	2	76,242
Total	60	\$4,071,968	0	\$0	9	\$331,245

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

**General Employees – Groups E/F**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤ 35	0	\$0	0	\$0	40	\$206,583
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	2	20,301	0	0
39	0	0	0	0	1	7,335
40	0	0	0	0	0	0
41	0	0	1	11,115	1	5,399
42	0	0	2	23,978	0	0
43	0	0	0	0	1	9,649
44	0	0	1	8,301	0	0
45	1	10,109	1	5,593	1	8,090
46	2	56,619	1	10,049	2	19,538
47	2	60,264	2	27,501	1	22,715
48	2	55,198	5	66,449	2	35,513
49	5	167,566	3	42,829	3	23,848
50	3	72,938	8	130,191	1	7,526
51	10	284,657	2	32,296	2	27,109
52	15	502,118	3	31,721	0	0
53	15	424,927	9	128,895	2	22,869
54	26	845,188	8	135,911	3	51,974
55	37	970,588	10	154,362	1	11,161
56	52	1,393,945	17	264,668	6	59,653
57	52	1,281,120	14	156,776	2	43,580
58	56	1,293,387	8	137,753	6	63,559
59	73	1,558,861	13	164,221	3	34,089
60	79	1,785,658	17	239,533	13	229,689
61	104	2,534,957	13	187,318	7	93,903
62	192	3,373,207	10	169,890	13	169,199
63	210	4,085,854	18	278,152	16	210,645
64	252	4,785,769	14	134,510	17	255,376
65	256	4,876,573	18	210,904	11	174,700

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

**General Employees – Groups E/F (Continued)**

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
66	291	\$5,359,841	25	\$268,209	6	\$85,908
67	301	6,020,166	17	234,940	16	162,867
68	321	5,980,938	14	159,242	15	205,569
69	306	5,716,928	13	142,806	9	103,364
70	328	5,896,742	11	109,766	15	184,051
71	316	6,103,965	7	98,537	18	173,004
72	194	3,695,011	9	79,105	14	164,590
73	217	3,968,951	6	50,952	18	230,626
74	185	3,140,659	9	101,918	20	251,328
75	201	3,434,472	6	67,887	21	259,719
76	156	2,568,168	7	62,237	22	281,412
77	127	1,859,194	8	136,603	16	176,098
78	131	1,919,235	7	83,148	18	193,568
79	102	1,375,205	3	17,337	20	222,146
80	86	1,186,272	6	61,136	10	111,817
81	76	1,058,924	6	48,689	14	126,720
82	102	1,502,838	3	21,754	23	250,571
83	68	922,569	4	42,614	21	163,970
84	70	996,023	1	8,601	16	153,259
85	70	786,399	2	12,194	10	46,539
86	45	472,798	1	5,393	12	111,617
87	56	616,148	1	4,802	12	107,734
88	42	472,955	1	6,380	10	78,056
89	35	337,242	0	0	8	38,674
90	22	250,842	1	4,992	12	101,541
91	20	241,655	0	0	3	20,270
92	22	264,771	0	0	1	3,791
93	19	156,520	0	0	3	19,442
94	5	72,131	0	0	3	19,073
≥ 95	25	197,680	0	0	2	18,058
Total	5,383	\$96,994,746	368	\$4,602,459	543	\$5,859,080

## 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	1	4,166	4,166
1972	0	0	0
1973	1	12,328	12,328
1974	0	0	0
1975	1	7,334	7,334
1976	0	0	0
1977	1	8,768	8,768
1978	2	20,606	10,303
1979	3	45,372	15,124
1980	2	31,135	15,567
1981	6	50,326	8,388
1982	1	8,278	8,278
1983	11	115,378	10,489
1984	10	111,495	11,150
1985	10	150,447	15,045
1986	20	273,812	13,691
1987	21	282,640	13,459
1988	34	446,801	13,141
1989	35	577,671	16,505
1990	41	656,769	16,019
1991	67	828,048	12,359
1992	74	1,252,743	16,929
1993	52	538,757	10,361
1994	85	1,258,213	14,803
1995	56	821,176	14,664
1996	88	1,135,367	12,902
1997	318	5,221,655	16,420
1998	88	1,583,506	17,994
1999	88	1,435,456	16,312
2000	116	1,933,853	16,671

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	154	\$2,335,586	\$15,166
2002	164	2,961,038	18,055
2003	182	3,551,527	19,514
2004	245	4,793,324	19,565
2005	245	4,330,560	17,676
2006	244	4,844,989	19,857
2007	279	5,385,842	19,304
2008	294	6,001,240	20,412
2009	489	10,265,999	20,994
2010	358	7,345,292	20,518
2011	338	6,673,505	19,744
2012	348	7,044,069	20,242
2013	326	6,424,746	19,708
2014	361	7,125,118	19,737
2015	513	10,365,386	20,205
2016	391	8,533,597	21,825
2017	396	8,915,587	22,514
2018	267	6,005,306	22,492
Total	6,974	\$134,073,423	\$19,225