

**Vermont State Employees'
Retirement System**
**Actuarial Valuation and
Review as of June 30, 2019**

The logo for Segal Consulting is a large, dark blue, stylized shape resembling a compass needle or a stylized 'S' pointing downwards. It is positioned on the right side of the page. The text 'Segal Consulting' is written in white, sans-serif font, with a white star icon to the left of the word 'Segal'.

 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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November 1, 2019

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, 2019, 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, 2021.

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

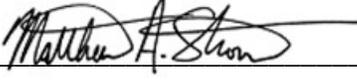

Matthew A. Strom, FSA, MAAA, EA
Senior Vice President and Actuary

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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, 2019, 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, 2019 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, 2019, provided by the Office of the State Treasurer;
- The unaudited assets of the Plan as of June 30, 2019, 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 was 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, 2019, were \$66.6 million, or 105.8% of the actuarially determined contribution of \$63.0 million. In the prior fiscal year, actual employer contributions were \$64.6 million, or 124.0% of the prior year's actuarially determined contribution.
3. The actuarially determined contribution for the fiscal year ending June 30, 2020, is \$78.9 million as determined with the June 30, 2018, 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 70.7%. 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 68.7%, compared to 69.2% 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, 2019, actuarial valuation are used to determine the actuarially determined contribution for the fiscal year ending June 30, 2021, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2022. The actuarially determined contribution for fiscal 2021 is \$83.9 million, an increase of \$5.0 million from fiscal 2020. The estimated fiscal 2022 actuarially determined contribution is \$86.5 million. 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, 2019, 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 \$815.5 million, which is an increase of \$35.7 million since the prior valuation.
7. The rate of return on the market value of assets was 6.1% for the July 1, 2018 to June 30, 2019 plan year. The return on the actuarial value of assets was 6.8% 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 of 7.5%.

8. The actuarial value of assets is 102.9% 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 \$55.0 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 14.78% to about 15.56% of payroll.
9. The actuarial loss from investment experience is \$13.8 million.
10. The net experience loss from sources other than investment experience was approximately, \$19.3 million, or 0.7% of the actuarial accrued liability. Additional detail regarding this loss is shown in *Section 2, Subsection 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, 2019, and June 30, 2020, 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, 2019, 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.
13. Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. We have included a discussion of various risks that may affect the System in *Section 2, Subsection L*.

Summary of Key Valuation Results

		2019	2018
Actuarially determined employer contributions:	• Actuarially determined employer contributions for fiscal 2021 (and 2020)	\$83,876,570	\$78,943,914
	• Estimated actuarially determined contributions for fiscal 2022 (and 2021)	86,484,565	81,400,167
Actuarial accrued liability for plan year beginning July 1:	• Retired members and beneficiaries	\$1,702,648,997	\$1,586,816,488
	• Deferred members as reported by the System	47,020,528	45,291,375
	• Active members	984,786,721	989,156,560
	• Inactive members as reported by the System	45,509,277	40,344,434
	• Total	2,779,965,523	2,661,608,857
	• Employer normal cost for plan year beginning July 1	17,719,313	16,992,303
Assets for plan year beginning July 1:	• Market value of assets (MVA)	\$1,909,469,823	\$1,841,500,283
	• Actuarial value of assets (AVA)	1,964,500,825	1,881,804,847
	• Actuarial value of assets as a percentage of market value of assets	102.88%	102.19%
Funded status for plan year beginning July 1:	• Unfunded actuarial accrued liability based on MVA	\$870,495,700	\$820,108,574
	• Funded percentage on MVA basis	68.69%	69.19%
	• Unfunded actuarial accrued liability based on AVA	\$815,464,698	\$779,804,010
	• Funded percentage on AVA basis	70.67%	70.70%
	• Remaining amortization period	19	20
Key assumptions:	• Interest rate	7.50%	7.50%
	• Inflation rate	2.50%	2.50%
Demographic data for plan year beginning July 1:	• Number of retired members and beneficiaries	7,268	6,974
	• Number deferred members as reported by the System	747	753
	• Number of inactive members as reported by the System	1,443	1,267
	• Number of active members	8,443	8,530
	• Total payroll	\$527,571,033	\$521,670,606
	• Average payroll	62,486	61,157
	• Total monthly benefits for all retired members and beneficiaries	12,050,134	11,172,785
	• Average monthly benefit for all retired members and beneficiaries	1,658	1,602

Important Information About Actuarial Valuations

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

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

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Membership data	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan 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: 2010 – 2019

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
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
2019	8,443	747	7,268	8,015	0.95

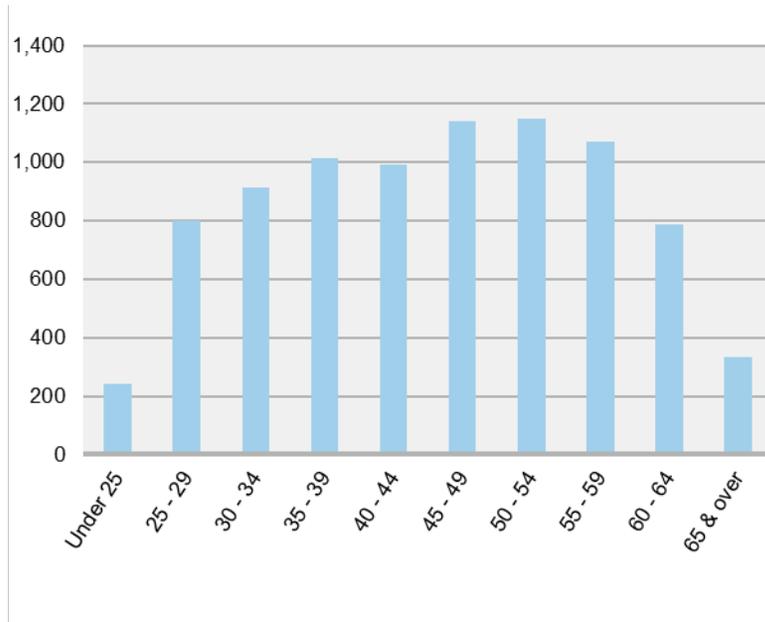
*Excludes inactive members as reported by the System.

Active Members

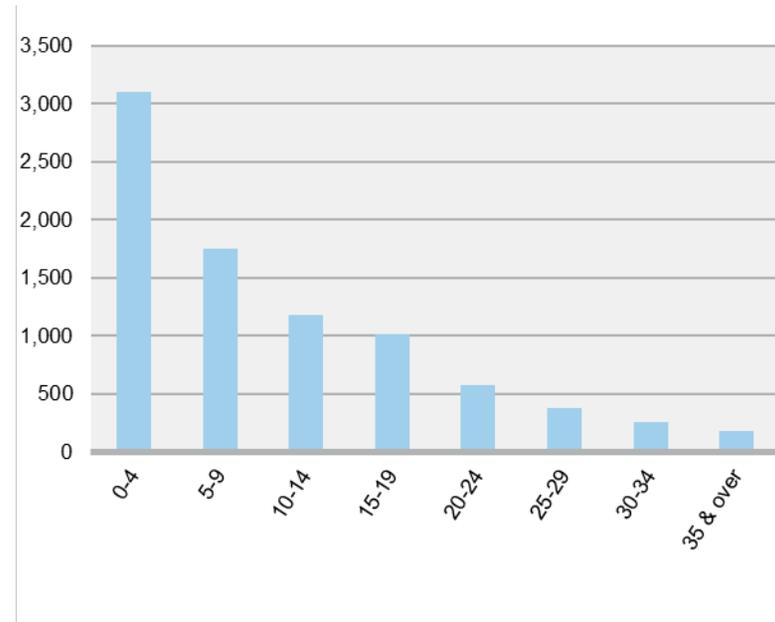
Plan costs are affected by the age, years of creditable service and payroll of active members. In this year's valuation, there were 8,443 active members with an average age of 45.7, average years of creditable service of 10.8 years, and average payroll of \$62,486. The 8,530 active members in the prior valuation had an average age of 45.9, average service of 11.0 years and average payroll of \$61,157.

Distribution of Active Members as of July 1, 2019

BY AGE



BY YEARS OF CREDITABLE SERVICE



Inactive and Deferred Members

In this year's valuation, there were 1,443 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 747 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.

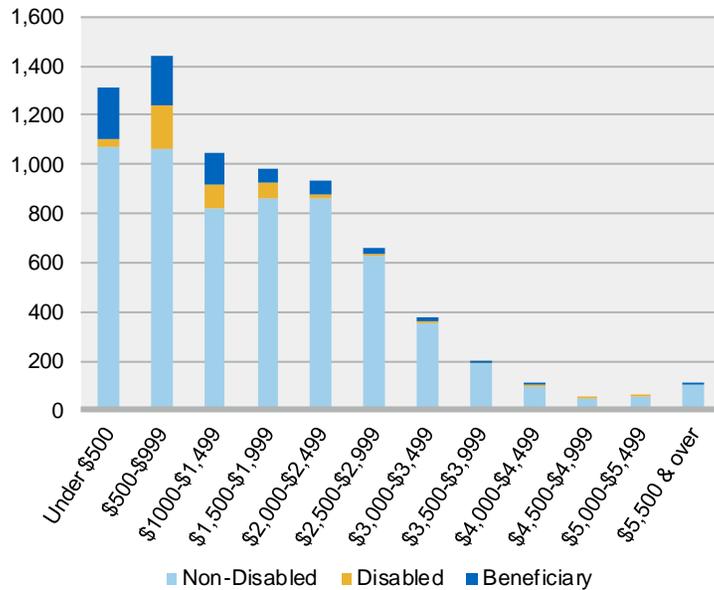
Retired Members and Beneficiaries

As of June 30, 2019, 6,567 retired members (including disability retirees) and 701 beneficiaries were receiving total monthly benefits of \$12,050,134. For comparison, in the previous valuation, there were 6,302 retired members and 672 beneficiaries receiving monthly benefits of \$11,172,785.

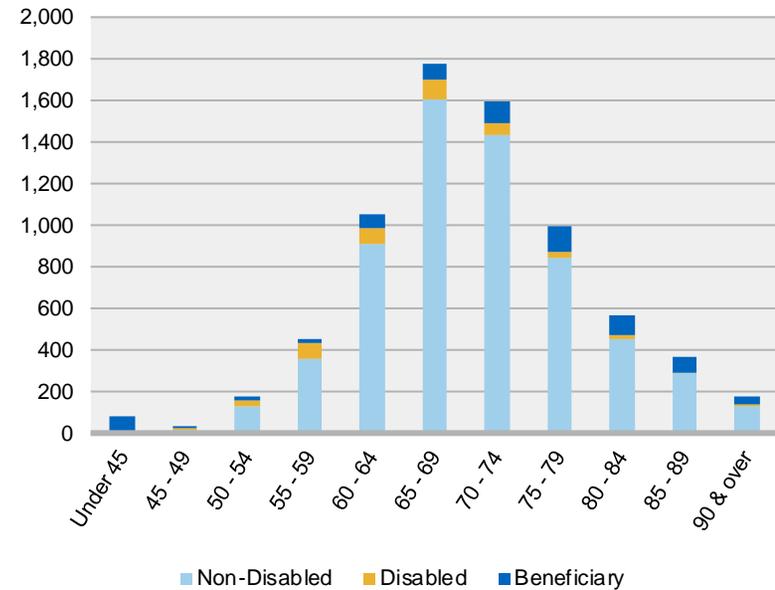
As of June 30, 2019, the average monthly benefit for retired members and beneficiaries is \$1,658, compared to \$1,602 in the previous valuation. The average age for retired members and beneficiaries is 70.5 in the current valuation, compared with 70.3 in the prior valuation.

Distribution of Pensioners as of July 1, 2019

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: 2010 – 2019

As of July 1	Active Members			Retired Members*		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
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
2019	8,443	45.7	10.8	6,567	70.6	1,718

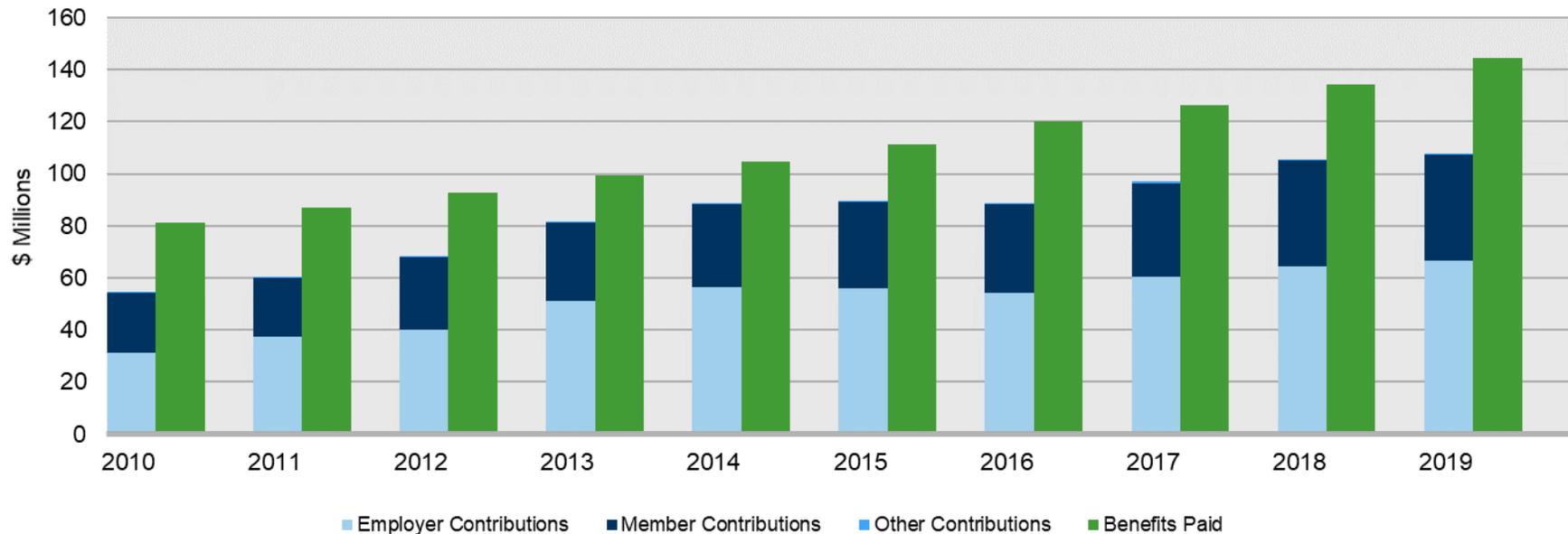
* Not including beneficiaries.

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, 2010 – 2019



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.

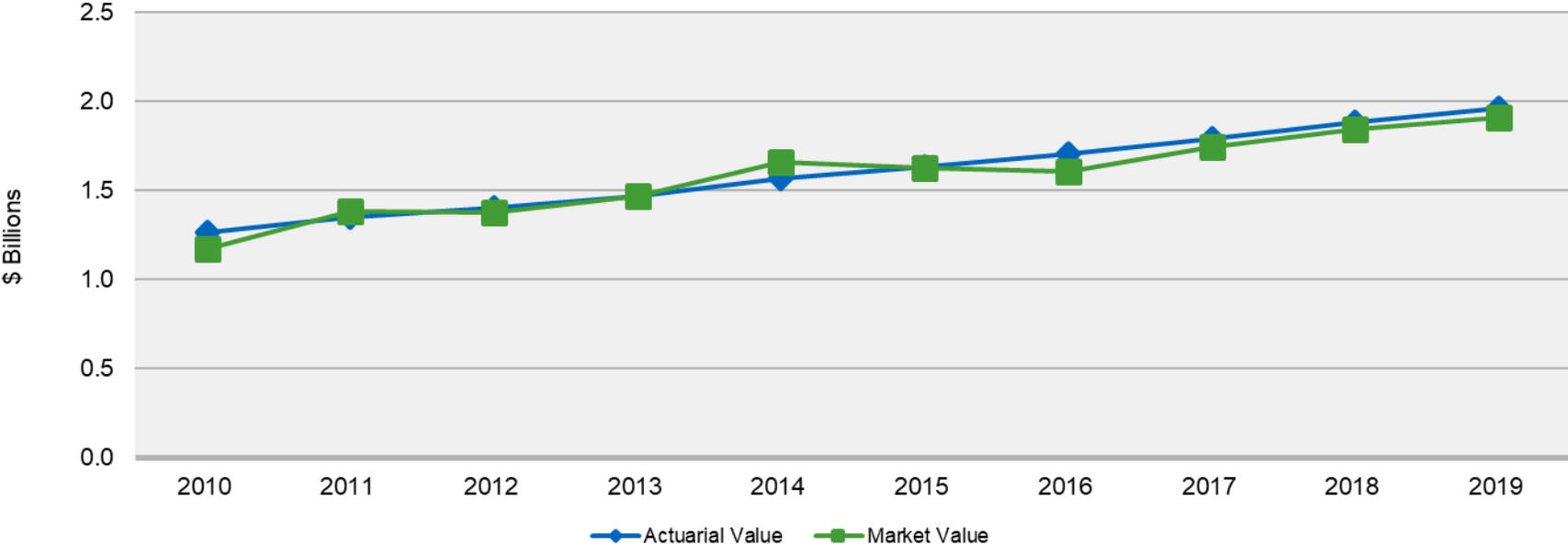
DETERMINATION OF ACTUARIAL VALUE OF ASSETS FOR YEAR ENDED JUNE 30, 2019

1	Actuarial value of assets, June 30, 2018	\$1,881,804,847
2	Net new money, including expected investment income (7.50%)	96,453,729
3	Preliminary asset value: 1 + 2	1,978,258,576
4	Smoothing adjustment	
	(a) Market value, June 30, 2019	\$1,909,469,823
	(b) Preliminary asset value	1,978,258,576
	(c) Unrecognized appreciation	-68,788,753
	(d) Adjustment	x 20%
		-13,757,751
5	Actuarial value of assets, June 30, 2019: 3 + 4d	\$1,964,500,825

The assets for valuation purposes are 102.88% 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, 2010 – 2019



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 \$33,021,221, which includes \$13,757,751 from investment losses and \$19,263,470 in losses from all other sources. The net experience variation from individual sources other than investments was 0.7% 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, 2019

1	Net loss from investments*	-\$13,757,751
2	Net loss from other experience	<u>-19,263,470</u>
3	Net experience loss: 1 + 2	-\$33,021,221

* 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 6.10% for the year ended June 30, 2019.

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 2019 plan year was 6.76%. 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, 2019 with regard to its investments.

INVESTMENT EXPERIENCE

		Year Ended June 30, 2019	
		Market Value	Actuarial Value
1	Investment income	\$111,036,177	\$125,762,614
2	Average value of assets	1,819,966,965	1,860,271,529
3	Rate of return: $1 \div 2$	6.10%	6.76%
4	Assumed rate of return	7.50%	7.50%
5	Expected investment income: 2×4	\$136,497,522	\$139,520,365
6	Actuarial gain/(loss): $1 - 5$	<u>-\$25,461,345</u>	<u>-\$13,757,751</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.

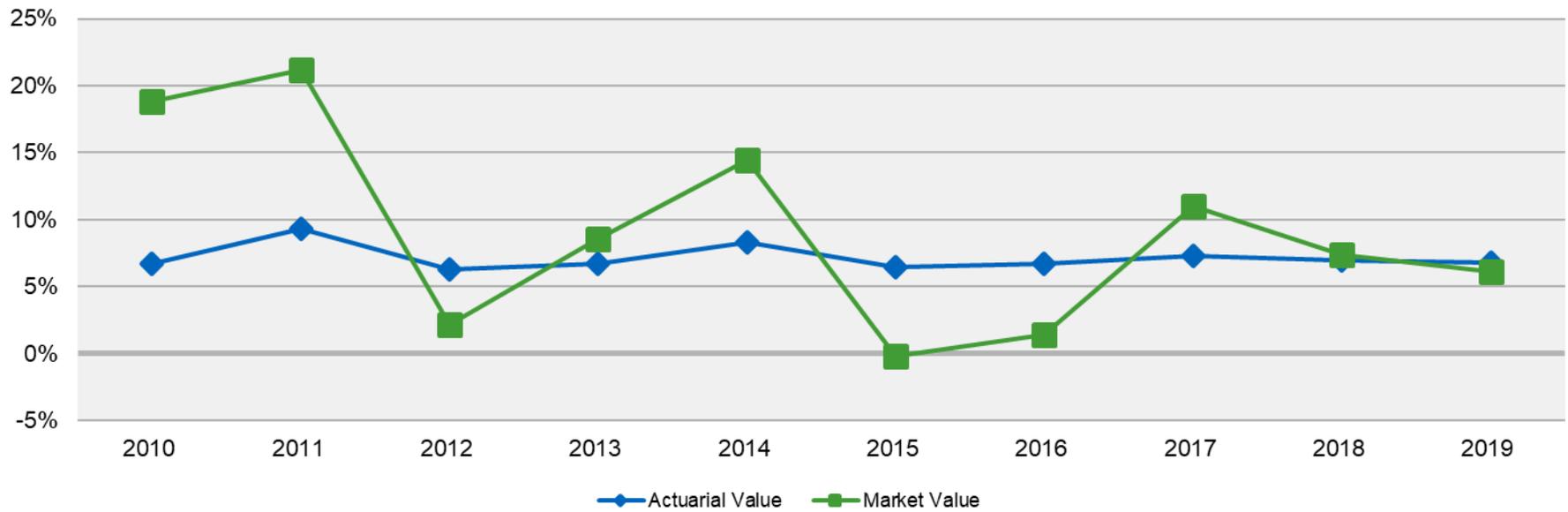
INVESTMENT RETURN – ACTUARIAL VALUE VS. MARKET VALUE: 2000 – 2019

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		
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		
2009	-130,060,430	-9.55	-238,392,427	-18.80	2019	125,762,614	6.76	111,036,177	6.10		
							Most recent five-year average return		6.84%		5.19%
							Most recent ten-year average return		7.11%		8.23%
							Most recent 15-year average return		6.24%		6.37%
							Most recent 20-year average return		6.64%		5.93%

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, 2010 – 2019



Administrative Expenses

Administrative expenses for the System are paid by the State, therefore there is no provision for administrative expenses in the determination of the actuarially determined contribution.

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, 2019, amounted to \$19,263,470, which is 0.7% of the actuarial accrued liability.

EXPERIENCE GAIN/(LOSS) DUE TO CHANGES IN DEMOGRAPHICS FOR YEAR ENDED JUNE 30, 2019

Net turnover	-\$1,588,998
Retirement	-13,424,864
Mortality	-1,885,105
Disability retirements	291,792
Salary increase for continuing actives	344,400
COLA experience	11,993,826
Miscellaneous	<u>-14,994,521</u>
Total	<u>-\$19,263,470</u>

D. Changes in the Actuarial Accrued Liability

The actuarial accrued liability as of June 30, 2019 is \$2,779,965,523, an increase of \$118,356,666, or 4.4%, from the actuarial accrued liability as of the prior valuation date. The liability is expected to grow each year with normal cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (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, 2019

1	Unfunded actuarial accrued liability at beginning of year	\$779,804,010
2	Normal cost at beginning of year	52,027,002
3	Total contributions	-107,734,805
4	Interest	
	• For whole year on 1 + 2	\$62,387,326
	• For half year on 3	<u>-4,040,056</u>
	Total interest	<u>58,347,270</u>
5	Expected unfunded actuarial accrued liability	\$782,443,477
6	Changes due to:	
	• (Gain)/loss	\$33,021,221
	• Assumptions	0
	• Funding method	0
	• Plan provisions	<u>0</u>
	Total changes	<u>33,021,221</u>
7	Unfunded actuarial accrued liability at end of year	<u>\$815,464,698</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, 2019, there are 19 years remaining on this schedule.

The actuarially determined contribution for the fiscal year ending June 30, 2020, is \$78,943,914 as determined with the June 30, 2018, actuarial valuation. The results of this June 30, 2019, actuarial valuation are used to determine the actuarially determined contribution for the fiscal year ending June 30, 2021, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2022, as shown in *Subsection H*.

The preliminary contribution requirement as of July 1, 2019, 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			
		2019		2018	
		Amount	% of Payroll	Amount	% of Payroll
1	Total normal cost, adjusted for timing*	\$55,108,227	10.01%	\$53,942,744	9.91%
2	Expected employee contributions	<u>-37,388,914</u>	<u>-6.79%</u>	<u>-36,950,441</u>	<u>-6.79%</u>
3	Employer normal cost: 1 + 2	\$17,719,313	3.22%	\$16,992,203	3.12%
4	Actuarial accrued liability	2,779,965,523		2,661,608,857	
5	Actuarial value of assets	1,964,500,825		1,881,804,847	
6	Unfunded actuarial accrued liability: 4 - 5	815,464,698		779,804,010	
7	Payment on unfunded actuarial accrued liability, adjusted for timing*	63,628,234	11.56%	50,090,049	9.20%
8	Preliminary contribution requirement: 3 + 7	<u>\$81,347,547</u>	<u>14.78%</u>	<u>\$67,082,352</u>	<u>12.32%</u>
9	Projected payroll	\$550,510,718		\$544,379,167	

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

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, 2018 TO JULY 1, 2019

	Amount	% of Payroll
Preliminary contribution requirement as of July 1, 2018	\$67,082,352	12.32%
Effect of:		
• Plan amendment(s)	0	0.00%
• Change in asset method	0	0.00%
• Expected change in amortization payment due to payroll growth	2,504,503	0.46%
• Change in amortization method	9,086,699	1.67%
• Change in actuarial assumptions	0	0.00%
• Contributions (more)/less than actuarially determined contribution	-256,891	-0.05%
• Investment (gain)/loss	920,173	0.17%
• Other gains and losses on accrued liability	1,288,418	0.24%
• Net effect of other changes, including composition and number of members, payroll	<u>722,293</u>	-0.03%
Total change	\$14,265,195	2.46%
Preliminary contribution requirement as of July 1, 2019	\$81,347,547	14.78%

G. Amortization Schedule for Unfunded Actuarial Accrued Liability

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

UNFUNDED LIABILITY AMORTIZATION SCHEDULE

As of June 30	Balance	Amortization Payment (Year Following)	Funded Percentage
2019	\$815,464,698	\$63,628,234*	70.67%
2020	810,653,393	65,537,081	71.80%
2021	803,502,106	67,503,194	73.01%
2022	793,775,963	69,528,289	74.24%
2023	781,220,695	71,614,138	75.49%
2024	765,561,128	73,762,562	76.76%
2025	746,499,561	75,975,439	78.07%
2026	723,714,016	78,254,702	79.41%
2027	696,856,365	80,602,343	80.80%
2028	665,550,304	83,020,414	82.23%
2029	629,389,180	85,511,026	83.72%
2030	587,933,650	88,076,357	85.26%
2031	540,709,163	90,718,648	86.87%
2032	487,203,254	93,440,207	88.54%
2033	426,862,630	96,243,413	90.27%
2034	359,090,033	99,130,716	92.08%
2035	283,240,872	102,104,637	93.96%
2036	198,619,596	105,167,776	95.90%
2037	104,475,795	108,322,809	97.92%
2038	0	0	100.00%

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

H. Actuarially Determined Contribution for Following Two Fiscal Years

On the basis of the June 30, 2019, actuarial valuation, the employer normal cost rate is 3.22%. This rate is applied to the projected payrolls for fiscal 2021 and fiscal 2022 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, 2021, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2022, as shown below. The final actuarially determined contribution for fiscal 2022 will be determined with the next valuation.

ACTUARIALLY DETERMINED CONTRIBUTION: 2021 – 2022

Fiscal Year Ended June 30	Projected Payroll*	Employer Normal Cost Rate	Projected Contributions		
			Employer Normal Cost	Unfunded Liability	Total
2021	\$569,778,593	3.22%	\$18,339,489	\$65,537,081	\$83,876,570
2022	589,720,844	3.22%	18,981,371	67,503,194	86,484,565

* 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: 2011 – 2020

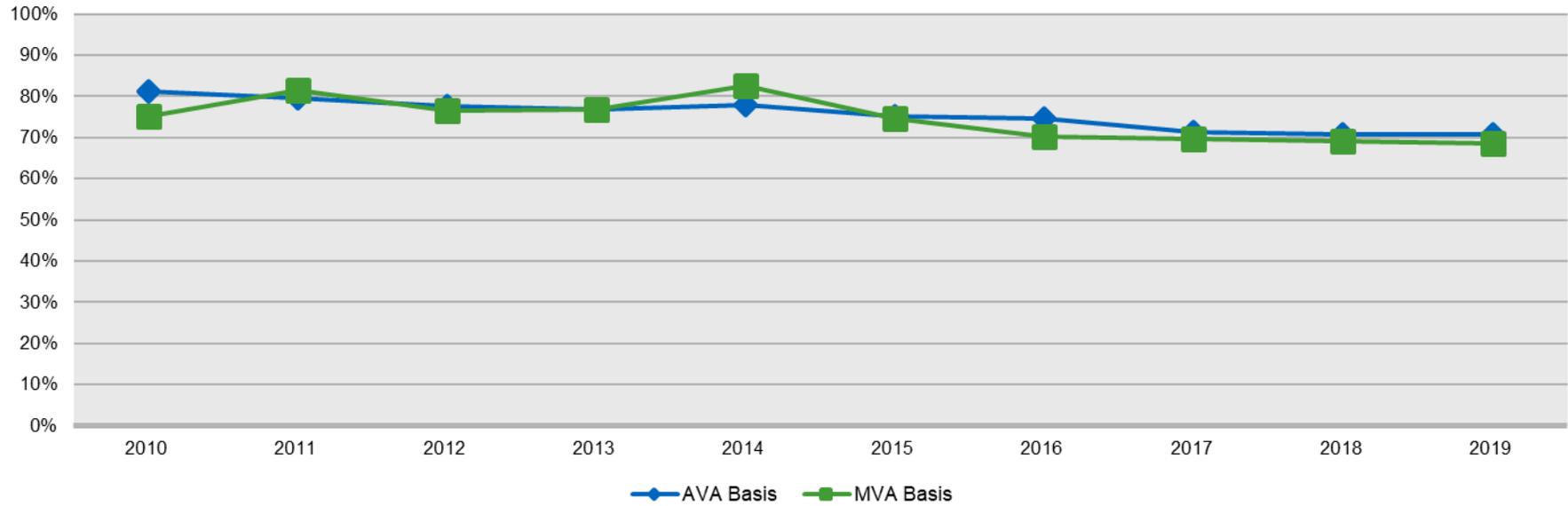
Fiscal Year Ended June 30	Actuarially Determined Contribution		Actual Employer Contribution		Percent Contributed
	Amount*	Percentage of Payroll**	Amount	Percentage of Payroll**	
2011	\$41,581,656	9.84%	\$37,572,599	8.89%	90.36%
2012	36,587,864	8.89%	40,302,433	9.79%	110.15%
2013	37,081,933	8.91%	51,370,307	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%	66,617,894	12.24%	105.77%
2020	78,943,914	14.01%	--	--	--

* 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 1st 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, 2019	June 30, 2018
Liabilities		
• Present value of benefits for retired members and beneficiaries	\$1,702,648,997	\$1,586,816,488
• Present value of benefits for inactive former members	92,529,805	85,635,809
• Present value of benefits for active members	<u>1,426,520,699</u>	<u>1,416,364,946</u>
Total liabilities	\$3,221,699,501	\$3,088,817,243
Assets		
• Total valuation value of assets	\$1,964,500,825	\$1,881,804,847
• Present value of future contributions by members	335,499,078	327,125,611
• Present value of future employer contributions for:		
» Entry age cost	106,234,900	100,082,775
» Unfunded actuarial accrued liability	<u>815,464,698</u>	<u>779,804,010</u>
Total of current and future assets	<u>\$3,221,699,501</u>	<u>\$3,088,817,243</u>

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.

In 2019, the Board engaged Segal to perform a detailed analysis of the potential range of the impact of risks relative to the Plan's future financial condition. This study included an overview of risks that affect the System and stakeholders, as well as various stochastic and deterministic modeling scenarios, primarily focusing on investment returns.

Below is 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 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 \$190.9 million in the asset value. A 10% increase in assets would cause the unfunded liability (market value basis) to decrease from \$870.5 million to \$679.6 million. Likewise, a 10% decrease in the asset value would cause the unfunded liability to increase from \$870.5 million to \$1.061 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 0.27% 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 \$83.4 million. The unfunded accrued liability (market value of assets basis) would increase from \$870.5 million to \$953.9 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 \$18.6 million to a gain of \$29.6 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 0.77 to a high of 0.95. Currently the Plan has a non-active to active member ratio of 0.95.
- As of July 1, 2019, the retired life actuarial accrued liability represents 61% 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 \$36.6 million more than contributions received, or 1.9% 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
	2019	2018	
Active members in valuation:			
• Number	8,443	8,530	-1.0%
• Average age	45.7	45.9	-0.2
• Average years of creditable service	10.8	11.0	-0.2
• Total payroll	\$527,571,033	\$521,670,606	1.1%
• Average payroll	62,486	61,157	2.2%
• Total active vested members	5,340	5,370	-0.6%
Inactive members:			
• Number of deferreds as reported by the System	747	753	-0.8%
• Number of inactives as reported by the System	1,443	1,267	13.9%
Retired members:			
• Number in pay status	6,157	5,893	4.5%
• Average age	70.9	71.0	-0.1
• Average monthly benefit	\$1,750	\$1,695	3.2%
Disability retirees:			
• Number in pay status	410	409	0.2%
• Average age	65.0	64.8	0.2
• Average monthly benefit	\$1,243	\$1,203	3.3%
Beneficiaries:			
• Number in pay status	701	672	4.3%
• Average age	69.7	69.3	0.4
• Average monthly benefit	\$1,093	\$1,029	6.2%

EXHIBIT B – RECONCILIATION OF MEMBERSHIP DATA

	Active Members	Deferreds	Inactives	Disability Retirees	Retired Members	Beneficiaries	Total
Number as of July 1, 2018	8,530	753	1,267	409	5,893	672	17,524
• New members	756	N/A	201	4	23	6	990
• Inactives as reported by the System	-369	N/A	369	N/A	N/A	N/A	0
• Deferreds as reported by the System	0	81	-81	N/A	N/A	N/A	0
• Retirements	-340	-69	-7	0	416	N/A	0
• New disabilities	-14	0	-1	16	-1	N/A	0
• Return to work from disability	0	N/A	N/A	0	N/A	N/A	0
• Died with beneficiary	-10	0	0	-4	-47	61	0
• Died without beneficiary	-3	-2	-1	-14	-113	-34	-167
• Lump sum cash-outs	-156	-9	-267	-1	-7	0	-440
• Rehire	49	-5	-37	N/A	-7	N/A	0
• Certain period expired	N/A	N/A	0	0	0	-5	-5
• Data adjustments	0	-2	0	0	0	1	-1
Number as of July 1, 2019	8,443	747	1,443	410	6,157	701	17,901

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

	Year Ended June 30, 2019	Year Ended June 30, 2018
Net assets at market value at the beginning of the year	\$1,841,500,283	\$1,748,442,294
Contribution income:		
• Employer contributions	\$66,617,894	\$64,564,323
• Member contributions	40,818,039	40,423,239
• Less administrative expenses	<u>-2,246,008</u>	<u>-2,026,240</u>
<i>Net contribution income</i>	<i>\$105,189,925</i>	<i>\$102,961,322</i>
Net other income	\$298,872	\$554,842
Investment income:		
• Interest, dividends and other income	\$24,531,137	\$23,473,589
• Asset appreciation	86,505,040	104,715,339
• Less investment fees	<u>-4,258,715</u>	<u>-4,556,759</u>
<i>Net investment income</i>	<i>\$106,777,462</i>	<i>\$123,632,169</i>
Total income available for benefits	\$212,266,259	\$227,148,333
Less benefit payments:		
• Benefits	-\$139,182,095	-\$129,699,506
• Refunds of contributions	-4,160,675	-3,172,033
• Death claims	-438,683	-693,500
• Transfers to other pension trust funds	<u>-515,266</u>	<u>-525,305</u>
<i>Net benefit payments</i>	<i>-\$144,296,719</i>	<i>-\$134,090,344</i>
Change in reserve for future benefits	\$67,969,540	\$93,057,989
Net assets at market value at the end of the year	\$1,909,469,823	\$1,841,500,283

EXHIBIT D – SUMMARY STATEMENT OF PLAN ASSETS

	June 30 , 2019	June 30, 2018
Cash equivalents	\$15,874,524	\$11,677,231
Total accounts receivable	142,449,904	71,880,568
Prepaid expenses	54,966	42,957
Capital assets, net of depreciation	1,253,633	1,539,288
Investments:		
• Fixed Income	\$149,500,856	\$250,284,237
• Equities	144,778,289	275,418,951
• Mutual and commingled funds	1,427,977,444	1,143,801,623
• Real estate and venture capital	<u>170,054,992</u>	<u>171,489,045</u>
Total investments at market value	\$1,892,311,581	\$1,840,993,856
Total assets	\$2,051,944,608	\$1,926,133,900
Total liabilities	-\$142,474,785	-\$84,633,617
Net assets at market value	\$1,909,469,823	\$1,841,500,283
Net assets at actuarial value	\$1,964,500,825	\$1,881,804,847

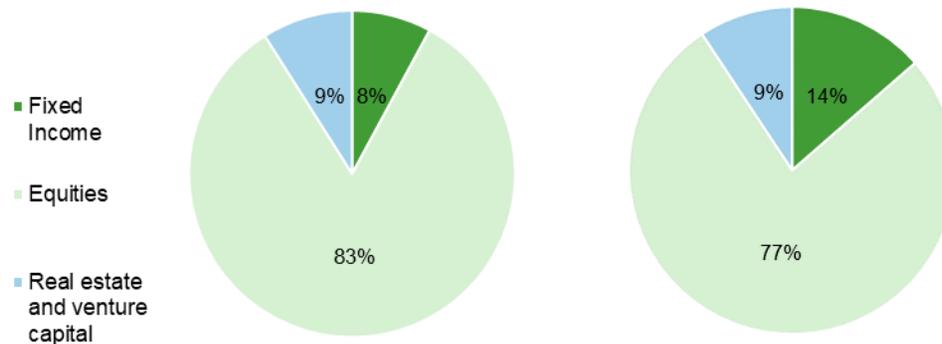


EXHIBIT E – DEVELOPMENT OF THE FUND THROUGH JUNE 30, 2019

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
2009							\$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	123,632,169	-2,026,240	-134,090,344	1,841,500,283	1,881,804,847	102.19%
2019	66,617,894	40,818,039	298,872	106,777,462	-2,246,008	-144,296,719	1,909,469,823	1,964,500,825	102.88%

* 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:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners:	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.
Actuarial Cost Method:	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.
Actuarial Gain or Loss:	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.
Actuarially Equivalent:	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	<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>

Actuarial Present Value of Future Plan Benefits:	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.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for 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).
Actuarial Value of Assets (AVA):	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.
Actuarially Determined:	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.
Actuarially Determined Contribution (ADC):	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.
Amortization Method:	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.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Assumptions or Actuarial Assumptions:	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>
Closed Amortization Period:	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.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	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.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	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.
Funded Percentage:	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.
GASB 67 and GASB 68:	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.
Investment Return:	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.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal Cost:	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.
Open Amortization Period:	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.
Plan Fiduciary Net Position:	Market value of assets.
Total Pension Liability (TPL):	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.
Unfunded Actuarial Accrued Liability (UAAL):	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.
Valuation Date or Actuarial Valuation Date:	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

Rationale for Assumptions:	The information and analysis used in selecting each assumption (except for economic assumptions and mortality tables) that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study dated 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 June 30, 2020 valuation.																					
Inflation:	2.50%.																					
Investment Return:	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.																					
Salary Increases:	<table border="1"> <thead> <tr> <th data-bbox="632 904 884 1013">Age</th> <th data-bbox="890 904 1089 1013">Annual Rate of Salary Increase (%)</th> </tr> </thead> <tbody> <tr> <td data-bbox="632 1018 884 1058">20</td> <td data-bbox="890 1018 1089 1058">7.04%</td> </tr> <tr> <td data-bbox="632 1063 884 1104">25</td> <td data-bbox="890 1063 1089 1104">6.21%</td> </tr> <tr> <td data-bbox="632 1109 884 1149">30</td> <td data-bbox="890 1109 1089 1149">5.66%</td> </tr> <tr> <td data-bbox="632 1154 884 1195">35</td> <td data-bbox="890 1154 1089 1195">5.26%</td> </tr> <tr> <td data-bbox="632 1200 884 1240">40</td> <td data-bbox="890 1200 1089 1240">4.92%</td> </tr> <tr> <td data-bbox="632 1245 884 1286">45</td> <td data-bbox="890 1245 1089 1286">4.36%</td> </tr> <tr> <td data-bbox="632 1291 884 1331">50</td> <td data-bbox="890 1291 1089 1331">3.70%</td> </tr> <tr> <td data-bbox="632 1336 884 1377">55</td> <td data-bbox="890 1336 1089 1377">3.50%</td> </tr> <tr> <td data-bbox="632 1382 884 1422">60</td> <td data-bbox="890 1382 1089 1422">3.50%</td> </tr> </tbody> </table>	Age	Annual Rate of Salary Increase (%)	20	7.04%	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 (%)																					
20	7.04%																					
25	6.21%																					
30	5.66%																					
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 E and F members (beginning at age 62 for deferred retirements) who retired before July 1, 2008. For Group F members retiring after July 1, 2008, assumed to occur at the rate of 2.55% per annum. The January 1, 2020 COLA is assumed to be 1.00% for those in group E and F who retired before July 1, 2008, and 1.60% 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 projection 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.

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 ¹			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	0.11	0.55
55	1.83	4.32	8.64	0.18	0.91
60	3.90	4.32	8.64	0.28	1.46

¹ 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 ²				
	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

² 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.

Age of Spouse:	Females three years younger than males.
Benefit Elections:	<ul style="list-style-type: none"> • Non-Group C All members are assumed to elect the single life annuity option. • Group C Single members are assumed to elect single life annuity. Married members are assumed to elect the 70% joint & survivor option
Actuarial Value of Assets:	The amount of the assets for valuation purposes equals the preliminary asset value plus 20% of the difference between market and preliminary asset values. The preliminary asset value is equal to the previous year's asset value (for valuation purposes) adjusted for contributions less benefit payments and expenses plus expected investment income. If necessary, a further adjustment is made to ensure that the valuation assets are within 20% of the market value.
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is the age at date of employment or, if date is unknown, current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary, with Normal Cost determined using the plan of benefits applicable to each member.
Changes in Actuarial Assumptions:	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.

Effective Date:	July 1, 1972 (for consolidated system).	
Creditable Service:	Service as a member plus purchased service.	
Average Final Compensation (AFC):	<ul style="list-style-type: none"> • Groups A/F • Group C • Group D 	<ul style="list-style-type: none"> Average annual compensation during highest 3 consecutive years. Average annual compensation during highest 2 consecutive years. Annual compensation at retirement.
Normal Retirement – Eligibility:	<ul style="list-style-type: none"> • Group A • Group C • Group D • Group F 	<ul style="list-style-type: none"> Earlier of age 65 with 5 years of service for members hired after July 1, 2004, and age 62 with 20 years of service. Age 55. Age 62 with 5 years of service. 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.
Normal Retirement – Amount:	<ul style="list-style-type: none"> • Group A • Group C • Group D • Group F 	<ul style="list-style-type: none"> 1.67% of AFC times service. 2.50% of AFC times service up to 20 years. 3.33% of AFC times service up to 30 years. 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.
Early Retirement – Eligibility:	<ul style="list-style-type: none"> • Groups A/D • Group C • Group F 	<ul style="list-style-type: none"> Age 55 with 5 years of service or 30 years of service. Age 50 with 20 years of service. Age 55 with 5 years of service.
Early Retirement – Amount:	<ul style="list-style-type: none"> • Group A • Group C • Group D • Group F 	<ul style="list-style-type: none"> Actuarial equivalent of normal retirement allowance. For members with 30 years of service, there is no reduction. Same as normal retirement allowance. Normal allowance reduced by 3% for each year commencement precedes age 62. 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

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

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

Post-Retirement Adjustments:	<ul style="list-style-type: none"> • 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%. • 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.
Optional Benefit and Death after Retirement:	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.
Refund of Contributions:	Upon termination, if the member so elects, or if no other benefit is payable, the member's accumulated contributions with interest are refunded.
Member Contribution Rates:	<ul style="list-style-type: none"> • Groups A/D/F 6.65%. • Group C 8.53%.
Changes in Plan Provisions:	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, 2019
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	243	241	2	--	--	--	--	--	--
	\$36,250	\$36,111	\$52,989	--	--	--	--	--	--
25 - 29	800	689	109	2	--	--	--	--	--
	\$48,382	\$46,272	\$61,315	\$70,296	--	--	--	--	--
30 - 34	913	509	338	66	--	--	--	--	--
	\$55,883	\$48,969	\$64,882	\$63,114	--	--	--	--	--
35 - 39	1,015	443	303	216	52	1	--	--	--
	\$60,081	\$50,892	\$64,468	\$70,967	\$67,617	\$58,049	--	--	--
40 - 44	990	305	238	202	205	40	--	--	--
	\$64,837	\$49,612	\$64,624	\$70,409	\$79,298	\$79,937	--	--	--
45 - 49	1,141	298	200	200	208	160	68	7	--
	\$67,545	\$50,102	\$64,349	\$71,180	\$77,646	\$81,717	\$77,984	\$72,054	--
50 - 54	1,150	252	190	166	189	147	128	76	2
	\$66,907	\$51,374	\$64,993	\$67,176	\$71,779	\$74,760	\$79,404	\$74,488	\$58,165
55 - 59	1,070	200	182	156	179	112	92	97	52
	\$66,637	\$50,747	\$63,143	\$66,555	\$67,840	\$75,582	\$78,665	\$77,728	\$74,852
60 - 64	788	123	124	121	139	80	67	58	76
	\$68,553	\$58,266	\$68,197	\$64,813	\$70,069	\$69,347	\$73,630	\$76,754	\$77,399
65 & over	333	42	65	50	49	33	23	15	56
	\$73,669	\$63,763	\$63,362	\$75,216	\$74,751	\$70,810	\$78,005	\$94,343	\$85,099
Total	8,443	3,102	1,751	1,179	1,021	573	378	253	186
	\$62,486	\$48,697	\$64,488	\$68,898	\$73,491	\$76,212	\$77,860	\$77,359	\$78,798

**TABLE 1B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019
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	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
55 - 59	1	--	--	--	--	--	--	--	--	1
	\$80,959	--	--	--	--	--	--	--	--	\$80,959
60 - 64	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
65 & over	1	--	--	--	--	--	--	--	--	1
	\$58,717	--	--	--	--	--	--	--	--	\$58,717
Total	2	--	2							
	\$69,838	--	--	--	--	--	--	--	--	\$69,838

**TABLE 1C – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019
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	28	28	--	--	--	--	--	--	--
	\$52,543	\$52,543	--	--	--	--	--	--	--
25 - 29	73	59	14	--	--	--	--	--	--
	\$71,701	\$68,170	\$86,583	--	--	--	--	--	--
30 - 34	78	22	49	7	--	--	--	--	--
	\$79,151	\$67,327	\$83,359	\$86,860	--	--	--	--	--
35 - 39	69	6	22	38	3	--	--	--	--
	\$86,997	\$63,234	\$82,191	\$93,794	\$83,673	--	--	--	--
40 - 44	77	5	8	22	34	8	--	--	--
	\$97,776	\$46,843	\$84,759	\$89,379	\$108,352	\$120,768	--	--	--
45 - 49	92	5	4	15	33	29	5	1	--
	\$99,762	\$47,747	\$73,997	\$88,083	\$109,861	\$103,992	\$112,993	\$115,969	--
50 - 54	41	1	4	5	17	7	7	--	--
	\$96,549	\$80,122	\$68,842	\$82,492	\$100,886	\$101,689	\$109,097	--	--
55 - 59	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
60 - 64	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
65 & over	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
Total	458	126	101	87	87	44	12	1	--
	\$86,348	\$62,753	\$82,716	\$90,485	\$106,615	\$106,676	\$110,720	\$115,969	--

**TABLE 1D – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019
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	2	1	1	--	--	--	--	--	--	--
	\$73,060	\$17,829	\$128,291	--	--	--	--	--	--	--
45 - 49	3	3	--	--	--	--	--	--	--	--
	42,988	42,988	--	--	--	--	--	--	--	--
50 - 54	10	3	5	1	--	1	--	--	--	--
	\$141,563	\$109,294	\$155,850	\$154,248	--	\$154,248	--	--	--	--
55 - 59	8	2	2	2	1	--	1	--	--	--
	\$126,805	\$96,373	\$154,248	\$98,345	\$162,258	--	\$154,248	--	--	--
60 - 64	12	3	2	3	2	2	--	--	--	--
	\$154,915	\$154,248	\$154,248	\$154,248	\$158,253	\$154,248	--	--	--	--
65 & over	16	2	5	5	1	--	1	1	1	1
	\$117,778	\$102,625	\$97,092	\$110,595	\$170,016	--	\$154,248	\$154,248	\$162,258	\$162,258
Total	51	14	15	11	4	3	2	1	1	1
	\$126,443	\$95,387	\$134,000	\$124,242	\$162,195	\$154,248	\$154,248	\$154,248	\$162,258	\$162,258

**TABLE 1E – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019
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	215	213	2	--	--	--	--	--	--
	\$34,129	\$33,951	\$52,989	--	--	--	--	--	--
25 - 29	727	630	95	2	--	--	--	--	--
	\$46,040	\$44,221	\$57,591	\$70,296	--	--	--	--	--
30 - 34	835	487	289	59	--	--	--	--	--
	\$53,709	\$48,140	\$61,750	\$60,296	--	--	--	--	--
35 - 39	946	437	281	178	49	1	--	--	--
	\$58,117	\$50,722	\$63,080	\$66,094	\$66,634	\$58,049	--	--	--
40 - 44	911	299	229	180	171	32	--	--	--
	\$62,035	\$49,765	\$63,643	\$68,091	\$73,521	\$69,729	--	--	--
45 - 49	1,046	290	196	185	175	131	63	6	--
	\$64,782	\$50,216	\$64,152	\$69,810	\$71,571	\$76,786	\$75,205	\$64,735	--
50 - 54	1,099	248	181	160	172	139	121	76	2
	\$65,122	\$50,558	\$62,398	\$66,154	\$68,902	\$72,832	\$77,686	\$74,488	\$58,165
55 - 59	1,061	198	180	154	178	112	91	97	51
	\$66,170	\$50,286	\$62,131	\$66,142	\$67,310	\$75,582	\$77,834	\$77,728	\$74,733
60 - 64	776	120	122	118	137	78	67	58	76
	\$67,218	\$55,867	\$66,786	\$62,539	\$68,782	\$67,170	\$73,630	\$76,754	\$77,399
65 & over	316	40	60	45	48	33	22	14	54
	\$71,483	\$61,820	\$60,551	\$71,285	\$72,767	\$70,810	\$74,540	\$90,064	\$84,159
Total	7,932	2,962	1,635	1,081	930	526	364	251	183
	\$60,695	\$47,878	\$62,725	\$66,597	\$70,011	\$73,219	\$76,357	\$76,899	\$78,440

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

All Employee Groups

Age	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
≤ 35	0	\$0	0	\$0	66	\$444,084
36	0	0	1	36,837	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	1	9,280	0	0
40	0	0	0	0	2	9,335
41	0	0	0	0	0	0
42	0	0	2	57,550	0	0
43	1	20,383	4	55,617	0	0
44	0	0	0	0	1	9,649
45	0	0	1	8,409	1	11,140
46	1	10,372	2	37,886	1	8,300
47	4	106,407	4	125,499	3	32,578
48	3	102,351	3	77,335	2	40,180
49	3	73,972	5	67,985	2	36,138
50	17	828,267	3	43,797	4	37,439
51	21	996,785	11	251,348	2	18,103
52	23	1,097,752	3	79,778	3	39,631
53	33	1,456,101	6	192,929	2	31,044
54	33	1,214,602	10	183,176	3	44,364
55	58	1,877,484	12	219,468	4	77,076
56	57	1,946,439	11	184,570	1	11,161
57	80	2,287,134	18	285,973	8	117,253
58	71	2,017,961	16	241,881	3	66,605
59	95	2,862,453	12	228,101	7	74,178
60	96	2,425,842	12	154,157	4	46,307
61	113	3,260,593	19	300,334	16	274,240
62	218	5,093,573	14	205,334	9	109,927
63	234	4,502,463	10	173,929	15	229,228
64	249	5,719,848	20	238,498	19	301,780
65	299	5,982,673	16	150,989	18	293,340

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	307	\$6,734,299	22	\$325,177	15	\$258,224
67	324	6,555,412	26	281,088	9	152,498
68	328	7,038,212	17	239,740	17	197,462
69	344	7,144,322	15	198,577	18	276,192
70	325	6,663,016	15	208,562	12	154,153
71	342	6,678,236	11	111,562	20	300,743
72	334	7,160,788	10	223,936	23	334,790
73	218	4,573,423	9	117,889	22	312,268
74	216	4,037,294	7	87,476	25	360,061
75	192	3,620,573	8	97,095	27	398,786
76	209	4,189,938	6	68,770	26	377,914
77	169	3,351,836	6	48,870	27	360,493
78	136	2,218,956	8	138,379	24	350,003
79	133	2,183,266	8	115,319	19	255,102
80	103	1,615,136	3	17,563	21	277,118
81	89	1,453,466	7	93,585	13	143,932
82	82	1,457,683	5	43,370	14	226,548
83	101	1,645,404	2	16,160	28	444,676
84	75	1,381,788	3	33,010	23	280,101
85	66	953,607	1	8,712	19	201,434
86	71	989,201	2	12,352	12	128,376
87	49	645,470	0	0	18	232,063
88	58	805,284	1	4,865	15	166,649
89	44	600,597	0	0	13	156,164
90	32	370,963	0	0	11	137,359
91	19	359,881	1	5,057	11	122,434
92	15	253,625	1	8,086	3	20,533
93	24	309,661	0	0	8	49,573
94	19	174,810	0	0	4	36,563
≥ 95	24	243,928	0	0	8	116,928
Total	6,157	\$129,293,532	410	\$6,115,860	701	\$9,192,220

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	1	47,762	0	0	0	0
56	0	0	0	0	0	0
57	1	8,886	0	0	0	0
58	0	0	0	0	0	0
59	0	0	0	0	0	0
60	0	0	0	0	0	0
61	2	85,601	0	0	1	7,192
62	0	0	0	0	0	0
63	0	0	0	0	0	0
64	2	56,437	1	5,717	0	0
65	0	0	1	1,883	0	0

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	3	\$92,216	1	\$17,369	1	\$9,466
67	5	111,971	1	8,164	0	0
68	3	78,812	0	0	0	0
69	3	80,520	0	0	1	44,515
70	3	83,233	1	21,743	1	11,507
71	5	130,728	0	0	1	24,021
72	3	65,210	0	0	1	39,657
73	7	206,175	0	0	0	0
74	0	0	0	0	2	19,395
75	3	93,204	0	0	2	20,349
76	0	0	0	0	1	15,512
77	6	197,795	0	0	2	25,827
78	4	106,837	0	0	4	47,804
79	2	46,339	0	0	0	0
80	6	182,436	0	0	0	0
81	4	100,420	1	12,454	0	0
82	6	126,473	0	0	0	0
83	3	81,319	0	0	1	21,172
84	8	242,757	0	0	0	0
85	4	97,035	0	0	0	0
86	3	85,376	0	0	0	0
87	3	71,608	0	0	2	22,096
88	4	111,845	0	0	2	26,173
89	5	94,940	0	0	1	4,274
90	2	43,465	0	0	1	13,504
91	2	56,776	0	0	1	5,795
92	1	7,609	1	8,086	0	0
93	3	48,187	0	0	5	34,241
94	1	12,055	0	0	0	0
≥ 95	3	32,270	0	0	2	6,115
Total	111	\$2,886,297	7	\$75,416	32	\$398,615

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	0	0
54	0	0	0	0	1	20,755
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	0	0	0	0	0	0
61	1	11,724	0	0	0	0
62	0	0	0	0	0	0
63	1	9,277	0	0	0	0
64	0	0	0	0	0	0
65	1	10,071	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	0	0	0	0	0	0
68	1	5,125	0	0	0	0
69	0	0	0	0	0	0
70	0	0	1	21,580	0	0
71	0	0	0	0	1	13,566
72	1	39,461	0	0	0	0
73	2	68,260	0	0	0	0
74	0	0	0	0	1	13,481
75	0	0	1	22,526	0	0
76	1	9,297	0	0	1	17,819
77	0	0	0	0	0	0
78	0	0	0	0	0	0
79	0	0	0	0	0	0
80	0	0	0	0	0	0
81	0	0	0	0	0	0
82	0	0	0	0	0	0
83	0	0	0	0	0	0
84	0	0	0	0	0	0
85	0	0	0	0	0	0
86	0	0	0	0	0	0
87	0	0	0	0	0	0
88	0	0	0	0	0	0
89	0	0	0	0	0	0
90	0	0	0	0	0	0
91	0	0	0	0	0	0
92	0	0	0	0	0	0
93	0	0	0	0	0	0
94	0	0	0	0	0	0
≥ 95	0	0	0	0	0	0
Total	8	\$153,215	2	\$44,106	4	\$65,621

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	0	\$0	24	\$217,878
36	0	0	1	36,837	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	1	46,146	0	0
43	1	20,383	1	30,954	0	0
44	0	0	0	0	0	0
45	0	0	0	0	0	0
46	0	0	1	32,221	0	0
47	0	0	3	115,320	1	12,678
48	0	0	1	49,119	0	0
49	1	17,986	0	0	0	0
50	9	584,696	0	0	1	13,351
51	13	805,267	3	111,092	0	0
52	9	603,860	1	46,785	0	0
53	15	857,641	3	160,765	0	0
54	14	664,614	1	51,026	0	0
55	16	701,434	1	16,712	1	24,480
56	14	818,532	1	27,120	0	0
57	14	510,732	0	0	1	31,162
58	7	359,659	2	81,775	0	0
59	19	959,768	0	0	0	0
60	14	611,772	0	0	0	0
61	15	939,271	1	37,574	1	21,258
62	19	939,229	1	11,676	1	29,239
63	14	598,460	0	0	1	37,297
64	17	842,069	0	0	1	23,602
65	7	302,332	0	0	1	32,382

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	14	\$640,382	2	\$76,766	2	\$44,685
67	9	373,763	0	0	1	12,244
68	5	254,878	0	0	1	31,596
69	13	568,095	1	36,594	1	16,918
70	4	149,112	1	32,162	1	25,228
71	9	355,209	0	0	2	70,348
72	12	573,255	3	123,985	2	45,998
73	9	402,609	1	44,573	2	56,490
74	1	28,546	1	35,861	0	0
75	5	197,866	0	0	3	90,139
76	10	485,294	0	0	2	66,451
77	6	291,796	0	0	1	29,540
78	5	197,023	0	0	3	89,434
79	4	183,119	1	31,091	2	60,568
80	2	96,554	0	0	2	50,952
81	2	92,303	1	29,770	1	18,621
82	3	155,358	0	0	1	30,628
83	2	77,451	0	0	3	114,378
84	3	147,226	0	0	2	51,289
85	0	0	0	0	1	32,370
86	1	50,486	0	0	2	59,281
87	1	43,422	0	0	2	65,222
88	4	146,019	0	0	1	32,396
89	2	93,945	0	0	4	87,180
90	2	56,693	0	0	0	0
91	0	0	0	0	1	28,226
92	1	44,679	0	0	0	0
93	0	0	0	0	0	0
94	0	0	0	0	1	16,869
≥ 95	0	0	0	0	0	0
Total	347	\$16,842,789	33	\$1,265,923	77	\$1,670,376

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	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	1	90,845	0	0	0	0
60	0	0	0	0	0	0
61	1	26,983	0	0	0	0
62	0	0	0	0	0	0
63	0	0	0	0	0	0
64	4	287,234	0	0	0	0
65	2	161,479	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	4	\$273,970	0	\$0	0	\$0
67	2	153,918	0	0	0	0
68	4	315,879	0	0	0	0
69	3	263,598	0	0	0	0
70	6	380,123	0	0	0	0
71	2	208,878	0	0	0	0
72	2	192,876	0	0	0	0
73	3	65,362	0	0	0	0
74	1	17,475	0	0	1	20,772
75	3	186,721	0	0	0	0
76	5	353,324	0	0	0	0
77	3	264,932	0	0	0	0
78	0	0	0	0	0	0
79	1	78,783	0	0	0	0
80	1	36,957	0	0	0	0
81	1	84,339	0	0	0	0
82	3	179,972	0	0	1	90,678
83	1	64,816	0	0	1	34,672
84	1	104,241	0	0	1	67,885
85	0	0	0	0	0	0
86	1	100,815	0	0	0	0
87	2	68,149	0	0	0	0
88	0	0	0	0	0	0
89	1	41,186	0	0	1	30,109
90	0	0	0	0	1	69,739
91	2	144,127	0	0	0	0
92	1	73,003	0	0	0	0
93	0	0	0	0	0	0
94	1	17,769	0	0	0	0
≥ 95	2	70,775	0	0	2	78,225
Total	64	\$4,308,528	0	\$0	8	\$392,080

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	42	\$226,206
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	1	9,280	0	0
40	0	0	0	0	2	9,335
41	0	0	0	0	0	0
42	0	0	1	11,404	0	0
43	0	0	3	24,664	0	0
44	0	0	0	0	1	9,649
45	0	0	1	8,409	1	11,140
46	1	10,372	1	5,665	1	8,300
47	4	106,407	1	10,180	2	19,900
48	3	102,351	2	28,216	2	40,180
49	2	55,986	5	67,985	2	36,138
50	8	243,570	3	43,797	3	24,088
51	8	191,518	8	140,256	2	18,103
52	14	493,893	2	32,992	3	39,631
53	18	598,460	3	32,164	2	31,044
54	19	549,988	9	132,150	2	23,609
55	41	1,128,289	11	202,756	3	52,596
56	43	1,127,907	10	157,450	1	11,161
57	65	1,767,516	18	285,973	7	86,091
58	64	1,658,302	14	160,106	3	66,605
59	75	1,811,840	12	228,101	7	74,178
60	82	1,814,070	12	154,157	4	46,307
61	94	2,197,014	18	262,760	14	245,790
62	199	4,154,344	13	193,659	8	80,688
63	219	3,894,726	10	173,929	14	191,931
64	226	4,534,108	19	232,781	18	278,177
65	289	5,508,791	15	149,107	17	260,958

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	286	\$5,727,730	19	\$231,041	12	\$204,074
67	308	5,915,760	25	272,924	8	140,254
68	315	6,383,517	17	239,740	16	165,867
69	325	6,232,109	14	161,983	16	214,759
70	312	6,050,547	12	133,077	10	117,418
71	326	5,983,422	11	111,562	16	192,808
72	316	6,289,985	7	99,951	20	249,135
73	197	3,831,016	8	73,316	20	255,778
74	214	3,991,273	6	51,615	21	306,413
75	181	3,142,782	7	74,569	22	288,298
76	193	3,342,024	6	68,770	22	278,131
77	154	2,597,314	6	48,870	24	305,125
78	127	1,915,096	8	138,379	17	212,766
79	126	1,875,026	7	84,229	17	194,534
80	94	1,299,190	3	17,563	19	226,166
81	82	1,176,404	5	51,361	12	125,312
82	70	995,881	5	43,370	12	105,242
83	95	1,421,818	2	16,160	23	274,454
84	63	887,565	3	33,010	20	160,927
85	62	856,572	1	8,712	18	169,064
86	66	752,525	2	12,352	10	69,095
87	43	462,291	0	0	14	144,746
88	50	547,419	1	4,865	12	108,080
89	36	370,527	0	0	7	34,601
90	28	270,805	0	0	9	54,117
91	15	158,978	1	5,057	9	88,413
92	12	128,334	0	0	3	20,533
93	21	261,474	0	0	3	15,332
94	17	144,986	0	0	3	19,694
≥ 95	19	140,883	0	0	4	32,588
Total	5,627	\$105,102,704	368	\$4,730,415	580	\$6,665,529

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	1	\$4,274	\$4,274
1971	0	0	0
1972	0	0	0
1973	0	0	0
1974	1	7,525	7,525
1975	0	0	0
1976	0	0	0
1977	1	12,454	12,454
1978	2	27,227	13,613
1979	1	6,013	6,013
1980	6	51,634	8,606
1981	0	0	0
1982	8	98,302	12,288
1983	9	110,647	12,294
1984	9	106,153	11,795
1985	13	210,992	16,230
1986	19	232,125	12,217
1987	31	417,249	13,460
1988	30	532,767	17,759
1989	34	579,303	17,038
1990	59	740,208	12,546
1991	68	1,170,946	17,220
1992	45	467,366	10,386
1993	81	1,222,533	15,093
1994	51	802,758	15,740
1995	86	1,127,166	13,107
1996	296	4,948,876	16,719
1997	85	1,569,050	18,459
1998	82	1,360,444	16,591
1999	108	1,899,831	17,591
2000	137	2,293,782	16,743

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	146	\$2,261,936	\$15,493
2002	156	2,870,882	18,403
2003	173	3,471,799	20,068
2004	236	4,691,455	19,879
2005	240	4,306,113	17,942
2006	239	4,779,769	19,999
2007	276	5,340,691	19,350
2008	288	6,042,206	20,980
2009	476	10,271,269	21,578
2010	351	7,388,388	21,050
2011	332	6,729,244	20,269
2012	344	7,123,241	20,707
2013	325	6,489,186	19,967
2014	355	7,181,179	20,229
2015	506	10,407,278	20,568
2016	390	8,655,921	22,195
2017	397	9,172,429	23,104
2018	441	9,733,073	22,070
2019	334	7,685,926	23,012
Total	7,268	\$144,601,613	\$19,896