

Vermont State Teachers' Retirement System

Actuarial Valuation and Review

As of June 30, 2020



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

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Segal



101 North Wacker Drive, Suite 500
Chicago, IL 60606-1724
segalco.com
T 312.984.8500

October 28, 2020

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

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2020, of the Vermont State Teachers' 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, 2022.

This report was prepared in accordance with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board, 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. We have not subjected this data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data.

Actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the System's actuary. In September 2020, the Board adopted new assumptions, effective for the June 30, 2020 valuation. In our opinion, the actuarial assumptions as approved by the Board are reasonable, taking into account the experience of the System and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience of the System.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates, and funding periods.

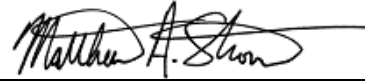
The actuarial calculations were directed under the supervision of Kathleen A. Riley, FSA, MAAA, EA and Matthew A. Strom, FSA, MAAA, EA. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. 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



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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Actuarial Valuation Summary

Purpose and basis

This report was prepared by Segal to present a valuation of the System as of June 30, 2020, pursuant to section 1942, subsection (n), of Title 16, Chapter 55, Vermont Statutes Annotated, relating to the Vermont State Teachers' 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 System assets to cover the estimated cost of settling the System'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, 2020 for the System is provided in separate reports.

The contribution requirements presented in this report are based on:

- The benefit provisions of the System, as administered by the Board;
- The characteristics of covered active members, inactive members, and retired members and beneficiaries as of June 30, 2020, provided by the Office of the State Treasurer;
- The unaudited assets of the System as of June 30, 2020, 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.

Section 1: Actuarial Valuation Summary

Valuation highlights

1. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2020. Due to the COVID-19 pandemic, market conditions have changed significantly since the valuation date. The System's actuarial status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. While it is impossible to determine how the market will perform over the next several months, and how that will affect the results of next year's valuation, Segal is available to prepare projections of potential outcomes upon request.
2. 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 1944, subsection (c)(4), of Title 16, Chapter 55, 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.
3. Actual employer contributions made during the fiscal year ending June 30, 2020, were \$126.9 million, or 100.6% of the actuarially determined contribution of \$126.2 million. In the prior fiscal year, actual employer contributions were \$119.2 million (including a one-time contribution of \$10.0 million paid during the fiscal year), or 112.8% of the prior year's actuarially determined contribution.
4. The actuarially determined contribution for the fiscal year ending June 30, 2021, is \$132.1 million as determined with the June 30, 2019, actuarial valuation.
5. The funded percentage (the ratio of the actuarial value of assets to actuarial accrued liability) is 51.3%, compared to the prior year's funded percentage of 55.7%. 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 49.2%, compared to 54.3% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of System assets to cover the estimated cost of settling the System's benefit obligation or the need for or the amount of future contributions.
6. The results of this June 30, 2020, actuarial valuation are used to determine the actuarially determined contribution for the fiscal year ending June 30, 2022, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2023. The actuarially determined contribution for fiscal 2022 is \$196.2 million, an increase of \$64.1 million from fiscal year 2021. Last year's estimate of the actuarially determined contribution for fiscal 2022 is \$60.1 million less than this year's actual amount. This is due to larger amortization of unfunded actuarial liability than expected driven by demographic losses, investment losses

Section 1: Actuarial Valuation Summary

on an actuarial basis, and the change in actuarial assumptions, as well as larger than expected normal cost driven primarily by the change in actuarial assumptions. The estimated fiscal 2023 actuarially determined contribution is \$202.1 million. The actuarially determined contribution is equal to the System's employer normal cost, plus the amount necessary to amortize the unfunded actuarial accrued liability as of June 30, 2020, 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.

7. The unfunded actuarial accrued liability is \$1.933 billion, which is an increase of \$378.8 million since the prior valuation.
8. The rate of return on the market value of assets was 4.6% for the July 1, 2019, to June 30, 2020, plan year. The return on the actuarial value of assets was 6.4% for the same period due to the recognition of prior year's investment gains and losses. This resulted in an actuarial loss when measured against the assumed rate of return of 7.5%. We advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments.
9. The actuarial value of assets is 104.3% 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 System is likely to increase unless the net loss is offset by future experience. The recognition of the deferred market losses of \$84.2 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 preliminary actuarially determined contribution rate (as shown on page 29, prior to application of the updated funding policy) would increase from 27.82% to 28.78% of payroll.
10. The actuarial loss from investment experience is \$21.3 million.
11. The net experience loss from sources other than investment experience was approximately \$37.1 million, or 1.0% of the actuarial accrued liability. Additional detail regarding this loss is shown in *Section 2, Actuarial experience*.
12. Changes in actuarial assumptions, which include lowering the investment return assumption from 7.5% to 7.0%, were approved by the Board on September 24, 2020. The assumptions adopted are outlined in detail in *Section 4, Exhibit 1*. As a result of these assumption changes, the total normal cost increased by \$30.3 million and the actuarial accrued liability increased by \$334.3 million. The total impact was an increase to the actuarially determined contribution of \$51.7 million, or 7.62% of payroll.
13. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the System'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, 2020, and June 30, 2021, 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.
14. This actuarial report as of June 30, 2020, 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 System.

Section 1: Actuarial Valuation Summary

15. 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, Risk*.

Section 1: Actuarial Valuation Summary

Summary of key valuation results

		2020	2019
Actuarially determined employer contributions:	<ul style="list-style-type: none"> Actuarially determined employer contributions for fiscal 2022 (and 2021) Actuarially determined contributions for fiscal 2023 (and 2022) 	\$196,206,504 202,092,699	\$132,141,701 136,105,952
Actuarial accrued liability for plan year beginning July 1:	<ul style="list-style-type: none"> Retired members and beneficiaries Deferred members as reported by the System Inactive members as reported by the System Active members Total Employer normal cost for plan year beginning July 1 	\$2,411,640,367 49,920,984 70,592,415 1,436,849,211 3,969,002,977 37,768,479	\$2,150,999,165 37,952,133 125,528,716 1,190,839,253 3,505,319,267 7,003,176
Assets for plan year beginning July 1:	<ul style="list-style-type: none"> Market value of assets (MVA) Actuarial value of assets (AVA) Actuarial value of assets as a percentage of market value of assets 	\$1,951,489,882 2,035,713,611 104.32%	\$1,904,488,565 1,950,859,980 102.43%
Funded status for plan year beginning July 1:	<ul style="list-style-type: none"> Unfunded/(overfunded) actuarial accrued liability based on MVA Funded percentage on MVA basis Unfunded actuarial accrued liability based on AVA Funded percentage on AVA basis Remaining amortization period 	\$2,017,513,095 49.17% \$1,933,289,366 51.29% 18	\$1,600,830,702 54.33% \$1,554,459,287 55.65% 19
Key assumptions:	<ul style="list-style-type: none"> Investment Return Inflation rate 	7.00% 2.30%	7.50% 2.50%
Demographic data for plan year beginning July 1:	<ul style="list-style-type: none"> Number of retired members and beneficiaries Number of deferred members as reported by the System Number of inactive members as reported by the System Number of active members Total payroll Average payroll Total monthly benefits for all retired members and beneficiaries Average monthly benefit for all retired members and beneficiaries 	9,843 887 2,710 9,996 \$645,902,984 64,616 17,690,605 1,797	9,514 819 2,756 9,862 \$624,908,253 63,365 16,557,992 1,740

Section 1: Actuarial Valuation Summary

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 System will be determined by the actual benefits and expenses paid and the actual investment experience of the System.

In order to prepare a valuation, 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.
Member data	An actuarial valuation for a plan is based on data provided to the actuary by the State. 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.

Section 1: Actuarial Valuation Summary

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

Actuarial Valuation Results

Member data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested 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: 2011 – 2020

Year Ended June 30	Active Members	Deferred Members ¹	Retired Participants and Beneficiaries	Total Non- Actives	Ratio of Non-Actives to Actives
2011	10,123	647	7,005	7,652	0.76
2012	10,262	793	7,376	8,169	0.80
2013	10,101	751	7,743	8,494	0.84
2014	9,952	740	8,086	8,826	0.89
2015	9,585	1,163	8,484	9,647	1.01
2016	9,919	747	8,763	9,510	0.96
2017	10,028	763	9,021	9,784	0.98
2018	9,892	787	9,269	10,056	1.02
2019	9,862	819	9,514	10,333	1.05
2020	9,996	887	9,843	10,730	1.07

¹ Excludes inactive members as reported by the System.

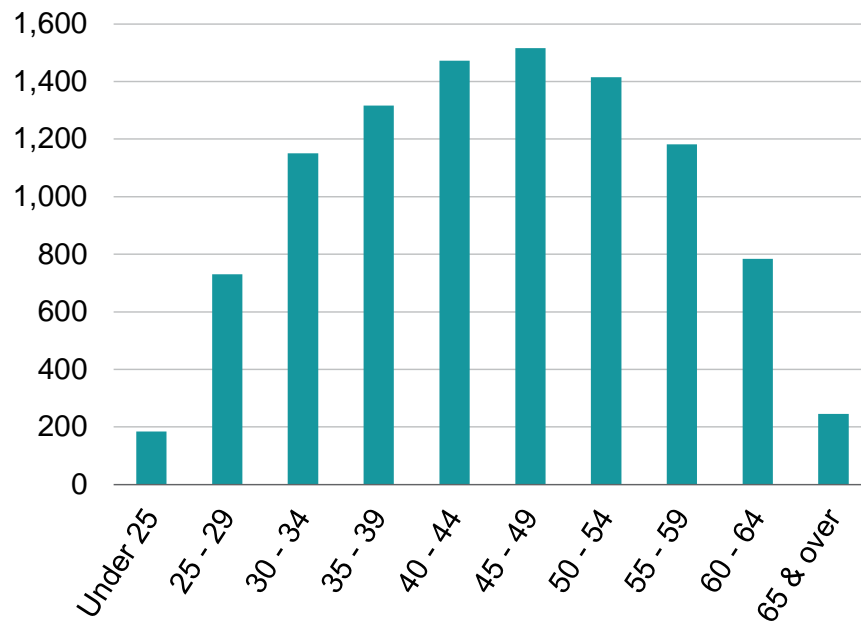
Section 2: Actuarial Valuation Results

Active members

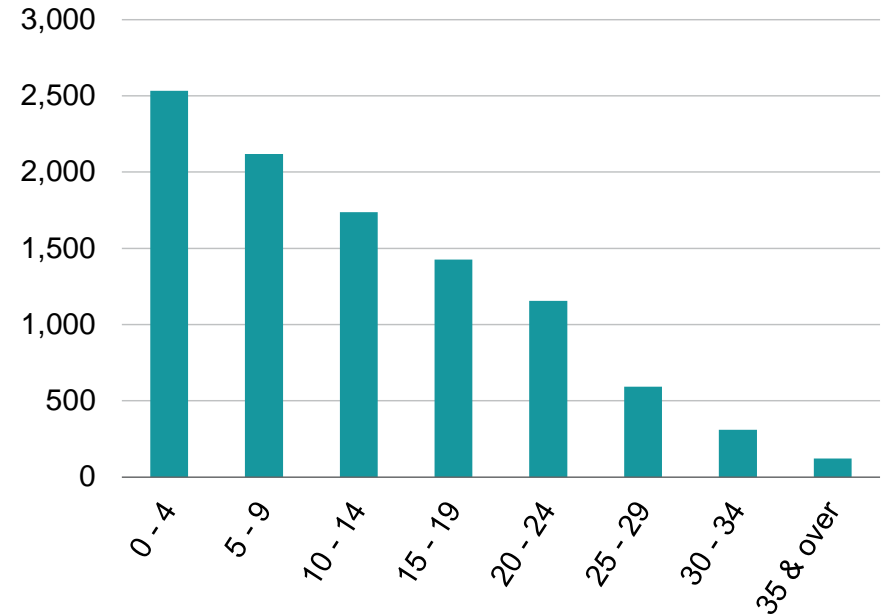
System costs are affected by the age, years of creditable service and payroll of active members. In this year's valuation, there were 9,996 active members with an average age of 45.4, average years of creditable service of 12.4 years, and average payroll of \$64,616. The 9,862 active members in the prior valuation had an average age of 45.7, average service of 12.7 years and average payroll of \$63,365.

Distribution of Active Members as of June 30, 2020

Actives By Age



Actives by Years of Service



Section 2: Actuarial Valuation Results

Inactive and deferred members

In this year's valuation, there were 2,710 inactive members as reported by the System. A member is reported as inactive if they have withdrawn from active employment within the six-year period preceding the valuation date, or if they withdrew prior to the six-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 887 deferred members as reported by the System. A member is reported as deferred if they have withdrawn from active employment prior to the six-year period preceding the valuation date and have a vested right to a deferred or immediate vested benefit.

Section 2: Actuarial Valuation Results

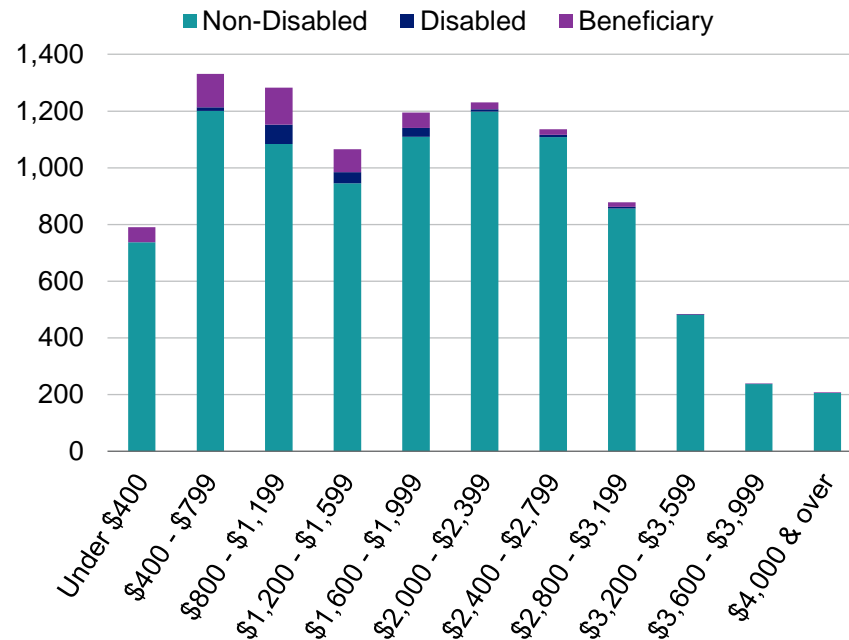
Retired members and beneficiaries

As of June 30, 2020, 9,340 retired members (including disability retirees) and 503 beneficiaries were receiving total monthly benefits of \$17,690,605. For comparison, in the previous valuation, there were 9,040 retired members and 474 beneficiaries receiving monthly benefits of \$16,557,992.

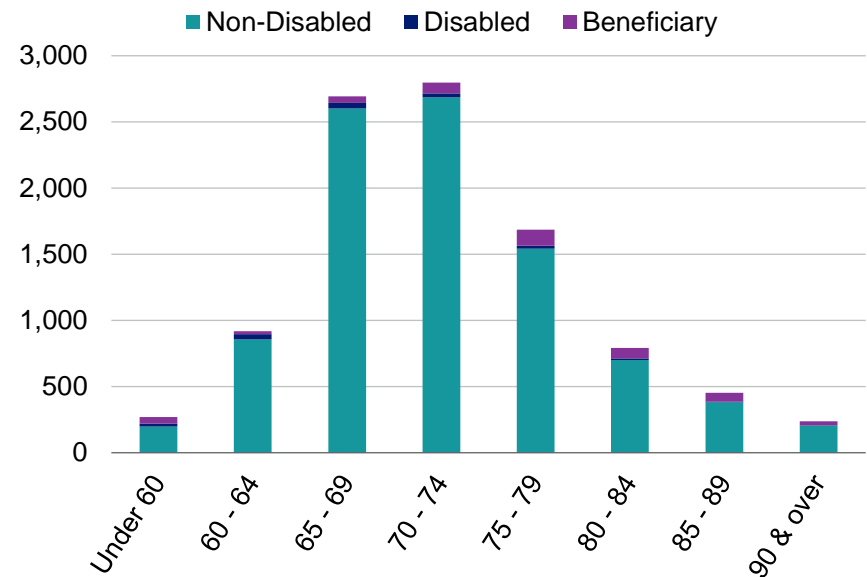
As of June 30, 2020, the average monthly benefit for retired members and beneficiaries is \$1,797, compared to \$1,740 in the previous valuation. The average age for retired members and beneficiaries is 72.5 in the current valuation, compared with 72.2 in the prior valuation.

Distribution of Pensioners as of June 30, 2020

Pensioners By Type and Monthly Amount



Pensioners By Type and Age



Section 2: Actuarial Valuation Results

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.

Member Data Statistics: 2011 – 2020

Year Ended June 30	Active Members			Retired Members*		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2011	10,123	46.9	13.8	6,667	--	\$1,417
2012	10,262	46.9	13.1	7,014	--	1,482
2013	10,101	46.6	13.1	7,356	--	1,514
2014	9,952	46.5	13.2	7,674	69.7	1,547
2015	9,585	46.2	12.9	8,006	70.0	1,614
2016	9,919	45.9	12.7	8,259	70.8	1,641
2017	10,028	45.8	12.6	8,581	71.2	1,683
2018	9,892	45.7	12.6	8,809	71.7	1,726
2019	9,862	45.7	12.7	9,040	72.1	1,771
2020	9,996	45.4	12.4	9,340	72.5	1,830

* Not including beneficiaries

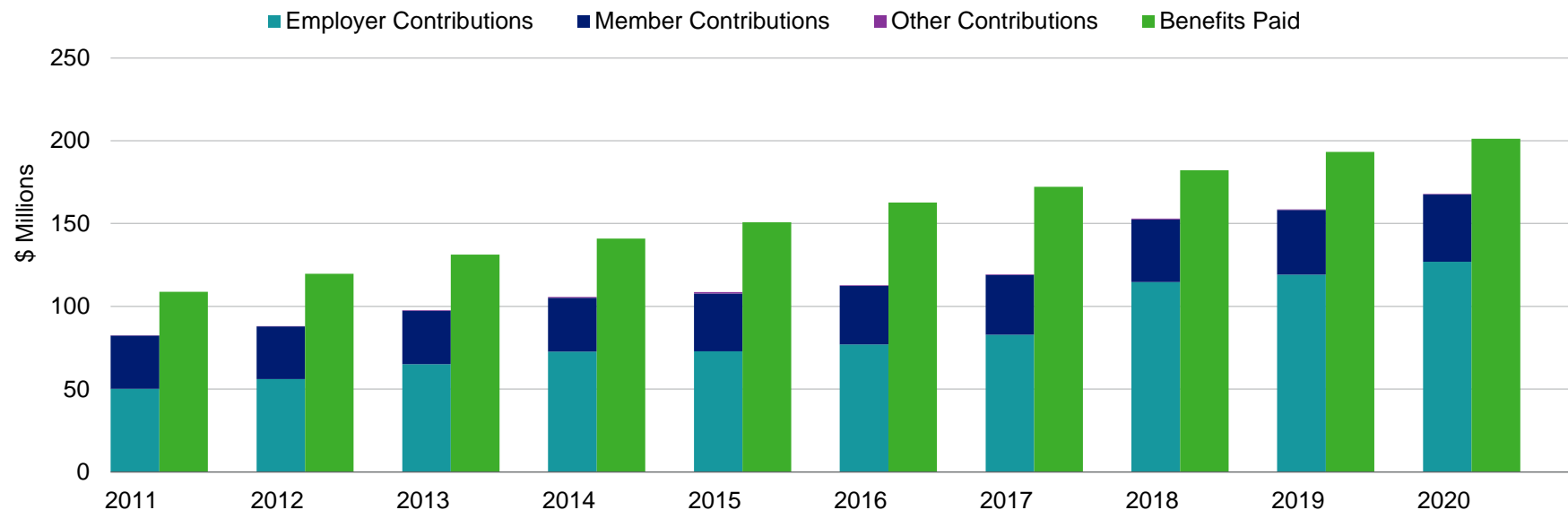
Section 2: Actuarial Valuation Results

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. Benefits have exceeded employer and member contributions for the most recent period shown. Benefits were 1.2 times employer and member contributions.

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, 2011 – 2020



Section 2: Actuarial Valuation Results

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, 2020

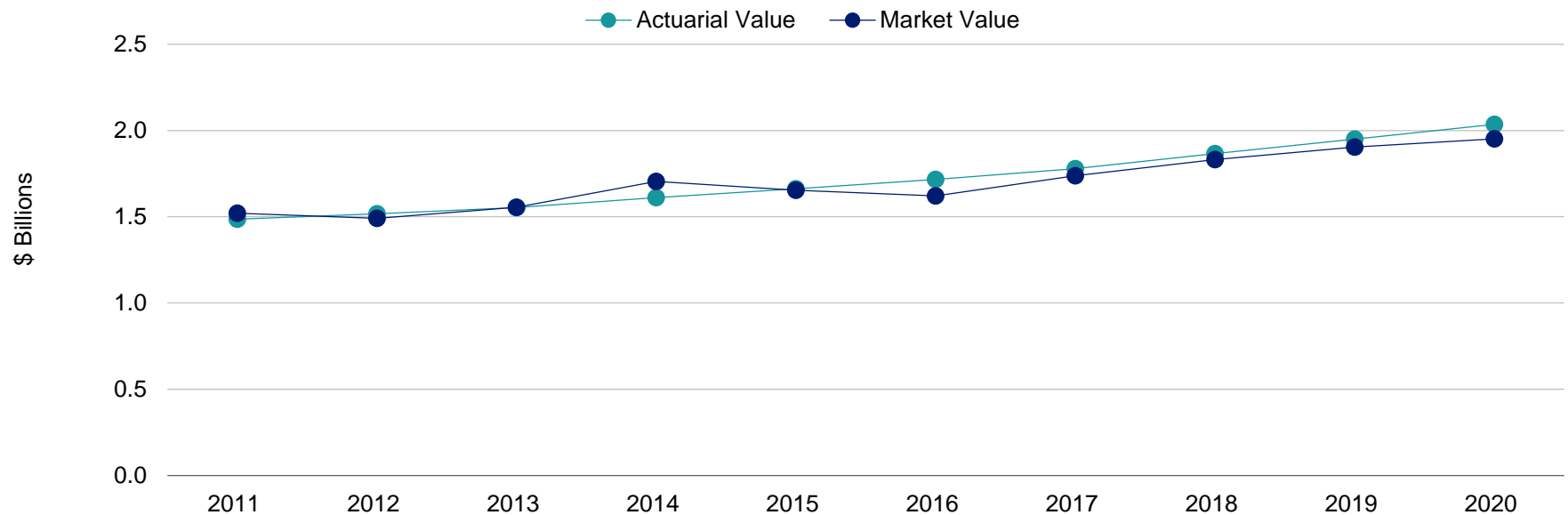
1	Actuarial value of assets, June 30, 2019		\$1,950,859,980
2	Net new money, including expected investment income (7.50%*)		105,909,563
3	Preliminary asset value: 1 + 2		2,056,769,543
4	Smoothing adjustment		
	(a) Market value, June 30, 2020	\$1,951,489,882	
	(b) Preliminary asset value	\$2,056,769,543	
	(c) Unrecognized appreciation	-105,279,661	
	(d) Adjustment	X 20%	-21,055,932
5	Actuarial value of assets, June 30, 2020: 3 + 4d		\$2,035,713,611
6	Actuarial value of assets as a percentage of market value: 5 / 4(a)		104.32%

*The investment return assumption was lowered from 7.50% to 7.00% effective July 1, 2020. However, the return assumption during the year ended June 30, 2020 was 7.50%. As such, the expectation of income is based on the assumptions in place at the beginning of the year (7.50%). If a 7.00% assumption was applied, the resulting unrecognized depreciation would be lowered. This change will be reflected in the next year.

Section 2: Actuarial Valuation Results

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 System'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, 2011 – 2020



Section 2: Actuarial Valuation Results

Actuarial experience

To calculate the actuarially determined contribution (ADC), 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 ADC will decrease relative to the previous year. On the other hand, the ADC 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 years' 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 \$58,418,705, which includes \$21,306,964 from investment losses and \$37,111,741 in losses from all other sources. The net experience variation from individual sources other than investments was 1.0% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended June 30, 2020

1	Net loss from investments*	-\$21,306,964
2	Net loss from other experience	<u>-37,111,741</u>
3	Net experience loss: 1 + 2	-\$58,418,705

* Details on next page

Section 2: Actuarial Valuation Results

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 4.55% for the year ended June 30, 2020.

For valuation purposes, the assumed rate of return on the actuarial value of assets for the year ended June 30, 2020, is 7.50%. The actual rate of return on an actuarial basis for the 2020 plan year was 6.40%. Since the actual return for the year was less than the assumed return, the System experienced an actuarial loss during the year ended June 30, 2020, with regard to its investments.

Investment Experience

		Year Ended June 30, 2020	
		Market Value	Actuarial Value
1	Investment income	\$85,703,874	\$123,556,188
2	Average value of assets	1,885,137,287	1,931,508,701
3	Rate of return: $1 \div 2$	4.55%	6.40%
4	Assumed rate of return*	7.50%	7.50%
5	Expected investment income: 2×4	\$141,385,296	\$144,863,153
6	Actuarial gain/(loss): $1 - 5$	-\$55,681,422	-\$21,306,965

*The investment return assumption was lowered from 7.50% to 7.00% effective July 1, 2020. However, the return assumption during the year ended June 30, 2020 was 7.50%. As such, the expectation of income is based on the assumptions in place at the beginning of the year (7.50%).

Section 2: Actuarial Valuation Results

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 chart below shows the rate of return on an actuarial basis compared to the actual market value investment return for the last 20 years, including averages over select time periods.

Investment Return – Actuarial Value vs. Market Value: 2001 - 2020

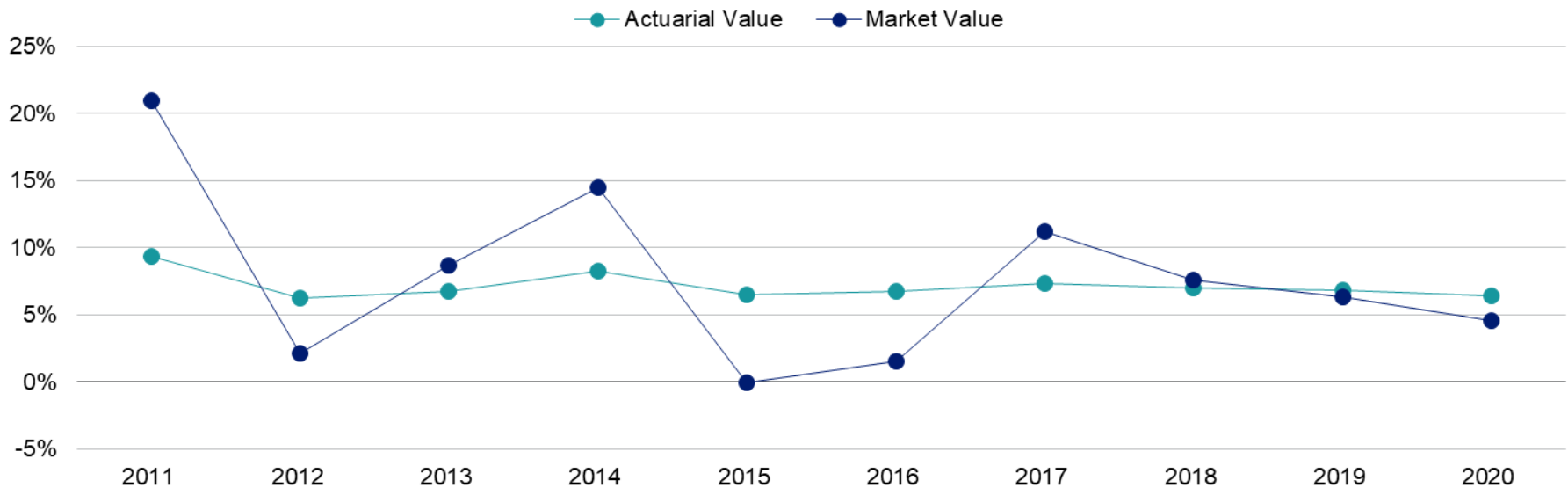
Year Ended June 30	Actuarial Value Investment Return		Market Value Investment Return		Year Ended June 30	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
2001	\$105,052,742	10.25%	-\$26,277,091	-2.23%	2011	\$129,010,590	9.32%	\$268,197,459	20.97%
2002	74,521,272	6.71	-50,765,984	-4.50	2012	91,041,364	6.25	31,182,310	2.09
2003	73,318,724	6.34	57,742,544	5.48	2013	99,823,830	6.72	127,041,593	8.70
2004	92,527,288	7.68	172,235,639	15.86	2014	125,880,755	8.29	219,532,643	14.44
2005	102,130,985	8.05	120,839,819	9.83	2015	103,064,276	6.50	-1,244,071	-0.07
2006	112,662,977	8.44	136,026,631	10.35	2016	110,878,140	6.79	24,710,920	1.52
2007	148,468,597	10.53	250,776,668	17.74	2017	123,782,547	7.34	178,144,379	11.20
2008	105,606,299	6.94	-103,733,250	-6.38	2018	122,579,470	7.02	129,866,264	7.61
2009	-177,198,490	-11.23	-302,070,164	-20.49	2019	126,427,866	6.87	113,804,311	6.30
2010	90,911,582	6.75	214,806,420	19.22	2020	123,556,188	6.40	85,703,874	4.55
						Most recent five-year average return		6.94%	6.24%
						Most recent ten-year average return		7.15%	7.33%
						Most recent 15-year average return		6.15%	5.97%
						Most recent 20-year average return		6.47%	5.74%

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

Section 2: Actuarial Valuation Results

Section 2, *Financial Information* 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, 2011 - 2020



Section 2: Actuarial Valuation Results

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 and service increases (greater or smaller than projected).

The net loss from this other experience for the year ended June 30, 2020, amounted to \$37,111,741, which is 1.0% of the actuarial accrued liability.

Experience Gain/(Loss) Due to Changes In Demographic Experience for Year Ended June 30, 2020

Net turnover	-\$21,770,846
Retirement	-24,972,035
Mortality	-3,335,043
Disability retirements	-53,881
Salary increases and service increases for continuing actives	10,408,437
COLA experience	8,838,015
Miscellaneous	<u>-6,226,388</u>
Total	-\$37,111,741

Section 2: Actuarial Valuation Results

Changes in the actuarial accrued liability

The actuarial accrued liability as of June 30, 2020, is \$3,969,002,977, an increase of \$463,683,710, or 13.2%, 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 and changes in assumptions (as discussed below).

Actuarial assumptions

The assumption changes reflected in this report are:

- The investment return assumption was lowered from 7.50% to 7.00%.
- The inflation assumption was lowered from 2.50% to 2.30%.
- The COLA assumption was lowered from 2.55% to 2.40% for Group A members and from 1.40% to 1.35% for Group C members.
- The mortality assumptions were updated as follows:
 - Pre-Retirement: PubT-2010 Teacher Employee Amount-Weighted Table with generational projection using scale MP-2019.
 - Healthy Post-Retirement - Retirees: PubT-2010 Teacher Healthy Retiree Amount-Weighted Table with generational projection using scale MP-2019.
 - Healthy Post-Retirement - Beneficiaries: 109% of the Pub-2010 Contingent Survivor Amount-Weighted Table with generational projection using scale MP-2019.
 - Disabled Retirees: PubNS-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table with generational projection using scale MP-2019.
- There were minor increases to the merit and seniority (and productivity) portion of individual salary increases for members between age 20-59 and minor decreases for members age 60 and older plus the revised inflation assumption.
- The active retirement assumptions were updated as follows:
 - For Group A and Group C-Grandfathered: One set of age-based rates for members eligible for unreduced benefits and one set of age-based rates for all other members.
 - For Group C-Non-grandfathered: A rate of 30% for members during the first year of unreduced eligibility, one set of age-based rates for members after the first year of unreduced eligibility, and one set of age-based rates for all other members.
- The inactive retirement assumptions were updated as follows:

Section 2: Actuarial Valuation Results

- For Group A and Group C-Grandfathered: Add a rate of 10% from ERA for each year until NRA, then 100% at NRA.
- Group C-Non-grandfathered: A rate of 50% from age 62-69, then 100% at age 70.
- The liability load of accumulated contributions for Inactive Members was removed. Liabilities for Inactive Members are now based on 100% of the accumulated contributions. Inactive members who are vested immediately become Deferred, and the liabilities for all Deferred members are based on the accrued benefit.
- There were major reductions to all rates of termination.
- The disability retirement rates were increased by 5% for females and decreased by 10% for males.
- These changes increased the actuarial accrued liability by \$334.3 million and increased the total normal cost by \$30.3 million.

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*.

Section 2: Actuarial Valuation Results

Development of unfunded actuarial accrued liability

Development of Unfunded Actuarial Accrued Liability for Year Ended June 30, 2020

1	Unfunded actuarial accrued liability at beginning of year		\$1,554,459,287
2	Normal cost at beginning of year		40,751,637
3	Total contributions		-167,948,124
4	Interest		
	• For whole year on 1 + 2	\$119,640,820	
	• For half year on 3	<u>-6,298,055</u>	
	Total interest		<u>113,342,765</u>
5	Expected unfunded actuarial accrued liability		\$1,540,605,565
6	Changes due to:		
	• (Gain)/loss	\$58,418,705	
	• Assumptions	334,265,096	
	• Funding method	0	
	• Plan provisions	<u>0</u>	
	Total changes		<u>392,683,801</u>
7	Unfunded actuarial accrued liability at end of year		\$1,933,289,366

Section 2: Actuarial Valuation Results

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, 2020, there are 18 years remaining on this schedule.

The actuarially determined contribution for the fiscal year ending June 30, 2021, is \$132,141,701 as determined with the June 30, 2019, actuarial valuation. The results of this June 30, 2020, actuarial valuation are used to determine the actuarially determined contribution for the fiscal year ending June 30, 2022, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2023, as shown in *Section 2, Projection of actuarially determined contribution for following two fiscal years*.

The preliminary contribution requirement as of July 1, 2020, 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, and actuarial gains and losses.

Preliminary Contribution Requirement

	Year Beginning July 1				
	2020		2019		
	Amount	% of Payroll	Amount	% of Payroll	
1	Total normal cost, adjusting for timing*	\$74,604,090	11.02%	\$42,252,197	6.46%
2	Expected employee contributions	<u>-36,835,611</u>	<u>-5.44%</u>	<u>-35,249,021</u>	<u>-5.39%</u>
3	Employer normal cost: 1 + 2	\$37,768,479	5.58%	\$7,003,176	1.07%
4	Actuarial accrued liability	3,969,002,977		3,505,319,267	
5	Actuarial value of assets	2,035,713,611		1,950,859,980	
6	Unfunded actuarial accrued liability: 4- 5	<u>1,933,289,366</u>		<u>1,554,459,287</u>	
7	Payment on unfunded actuarial accrued liability, adjusted for timing*	\$150,629,709	22.24%	\$121,289,738	18.55%
8	Preliminary contribution requirement: 3 + 7	\$188,398,188	27.82%	\$128,292,914	19.62%
9	Projected payroll	\$677,307,350		\$653,965,905	

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

Section 2: Actuarial Valuation Results

Reconciliation of actuarially determined contribution

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, 2019 to July 1, 2020

	Amount	% of Payroll
Preliminary Contribution Requirement as of July 1, 2019	\$128,292,914	19.62%
• Effect of plan amendment(s)	0	0.00%
• Effect of change in asset method	0	0.00%
• Effect of expected change in amortization payment due to payroll growth	3,638,692	0.56%
• Effect of expected change in amortization method	0	0.00%
• Effect of change in actuarial assumptions	52,681,047	8.06%
• Effect of total contributions (more)/less than actuarially determined contribution	-369,575	-0.06%
• Effect of investment (gain)/loss	1,722,556	0.26%
• Effect of other gains and losses on accrued liability	3,000,290	0.46%
• Net effect of other changes, including composition and number of members, payroll	<u>-567,736</u>	<u>-0.09%</u>
Total change	\$60,105,274	9.19%
Preliminary Contribution Requirement as of July 1, 2020	188,398,188	28.81%

Section 2: Actuarial Valuation Results

Amortization schedule for unfunded actuarial accrued liability – schedule of contributions required by statute

A schedule of projected future unfunded actuarial accrued liability payments, calculated as required by state statute, and projected funded percentages is shown below.

Unfunded Liability Amortization Schedule

As of July 1	Balance	Amortization Payment* (Year Following)	Funded Percentage
2020	\$1,933,289,366	\$124,928,430	51.29%
2021	1,939,392,649	157,304,971	52.18%
2022	1,912,432,607	162,024,120	54.24%
2023	1,878,703,837	166,884,843	56.37%
2024	1,837,586,081	171,891,389	58.58%
2025	1,788,411,272	177,048,130	60.86%
2026	1,730,460,051	182,359,574	63.22%
2027	1,662,958,044	187,830,361	65.68%
2028	1,585,071,871	193,465,272	68.23%
2029	1,495,904,868	199,269,230	70.88%
2030	1,394,492,514	205,247,307	73.63%
2031	1,279,797,524	211,404,727	76.50%
2032	1,150,704,602	217,746,868	79.48%
2033	1,006,014,812	224,279,274	82.58%
2034	844,439,563	231,007,653	85.81%
2035	664,594,158	237,937,882	89.15%
2036	464,990,890	245,076,019	92.64%
2037	244,031,648	252,428,299	96.25%
2038	0	0	100.00%

* The annual payment to amortize the unfunded actuarial liability is calculated based upon installments increasing at a rate of 3% per year.

Section 2: Actuarial Valuation Results

Projection of actuarially determined contribution for following two fiscal years

On the basis of the June 30, 2020, actuarial valuation, the employer normal cost rate is 5.58%. This rate is applied to the projected payrolls for fiscal 2022 and fiscal 2023 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, 2022, and to estimate the actuarially determined contribution for the fiscal year ending June 30, 2023, as shown below. The final actuarially determined contribution for fiscal 2023 will be determined with the next valuation.

Actuarially Determined Contribution: 2022 - 2023

Fiscal Year Ended June 30	Projected Contributions				
	Projected Payroll*	Employer Normal Cost Rate	Employer Normal Cost**	Unfunded Liability	Total
2022	\$697,626,571	5.58%	\$38,901,533	\$157,304,971	\$196,206,504
2023	718,555,368	5.58%	40,068,579	162,024,120	202,092,699

* In these projections, total payroll is assumed to increase by 3% each year.

**As time goes on, more employees will contribute at 6% versus 5%, increasing the average employee contribution rate. The portion of normal cost paid by employees will increase in future years, lowering the employer's normal cost and percentage of payroll from what is shown.

Pursuant to Section 1944, subsection (b)(2), of Title 16, Chapter 55, Vermont Statutes Annotated, if expected employee contributions were 5.00% for all Group C active members, the employer normal cost rate would be 6.01%, which would result in an employer normal cost for fiscal 2022 of \$41,960,884 and a total employer contribution requirement of \$199,265,855. For fiscal 2023, the total employer contribution requirement would be \$205,243,831.

Section 2: Actuarial Valuation Results

History of employer contributions

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

History of Employer Contributions: 2012 – 2021

Fiscal Year Ended June 30	Actuarially Determined Contribution		Actual Employer Contribution		
	Amount*	Percentage of Payroll**	Amount	Percentage of Payroll**	Percent Contributed
2012	\$51,241,932	8.72%	\$56,152,011	9.56%	109.58%
2013	60,182,755	10.51%	65,086,320	11.37%	108.15%
2014	68,352,825	11.66%	72,668,413	12.39%	106.31%
2015	72,857,863	14.90%	72,908,805	14.91%	100.07%
2016	76,102,909	12.84%	76,947,869	12.98%	101.11%
2017	82,659,576	14.39%	82,887,174	14.43%	100.28%
2018	88,409,437	14.64%	114,598,921	18.97%	129.62%
2019	105,640,777	16.13%	119,174,913	18.20%	112.81%
2020	126,197,389	19.30%	126,941,582	19.41%	100.59%
2021	132,141,701	19.51%	--	--	--

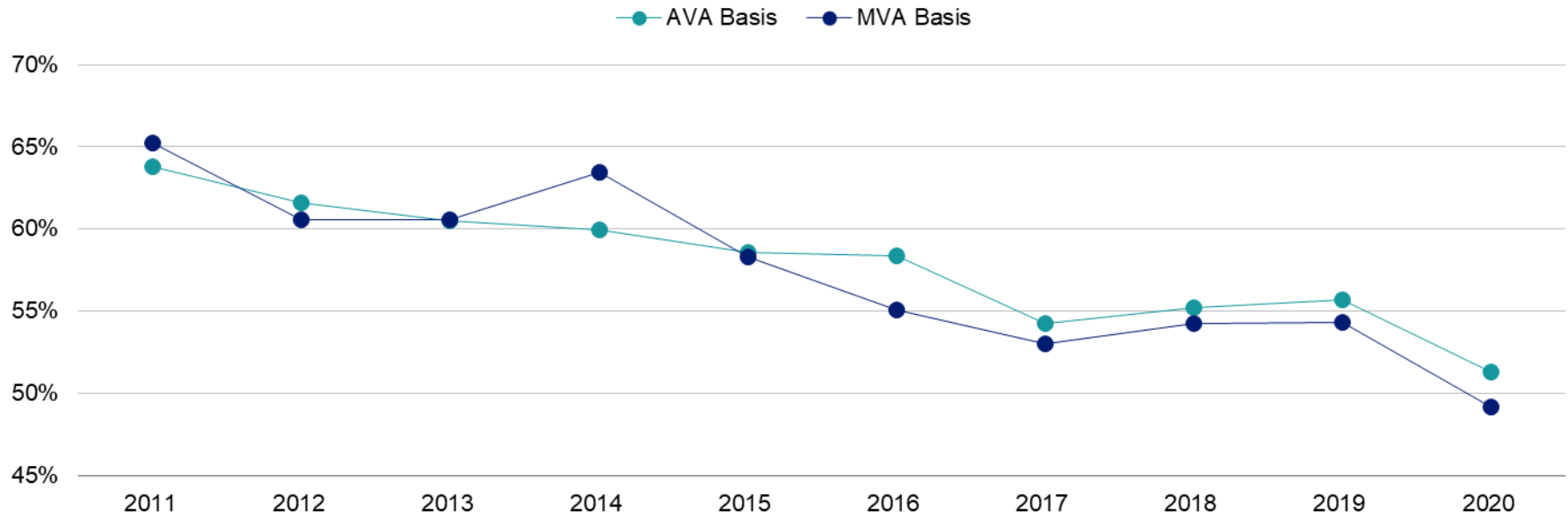
* Budgeted contribution amount from prior valuation report

** Based on expected payroll

Section 2: Actuarial Valuation Results

History of funded percentage

A history of the most recent years of funded percentage as of June 30th is shown below.



Section 2: Actuarial Valuation Results

Actuarial balance sheet

An overview of the System'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 System 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 System.

Second, this liability is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the System, 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, 2020	June 30, 2019
Liabilities		
• Present value of benefits for retired members and beneficiaries	\$2,411,640,367	\$2,150,999,165
• Present value of benefits for inactive former members	120,513,399	163,480,849
• Present value of benefits for active members	<u>2,216,322,707</u>	<u>1,483,053,294</u>
Total liabilities	\$4,748,476,473	\$3,797,533,308
Assets		
• Total valuation value of assets	\$2,035,713,611	\$1,950,859,980
• Present value of future contributions by members	411,069,057	263,332,427
• Present value of future employer contributions for:		
• Entry age cost	368,404,439	28,881,614
• Unfunded actuarial accrued liability	<u>1,933,289,366</u>	<u>1,554,459,287</u>
Total of current and future assets	\$4,748,476,473	\$3,797,533,308

Section 2: Actuarial Valuation Results

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 System'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 System. This discussion is focused on funding-related risks, but similar concerns may apply to risks regarding the level of expense and liabilities reported for System accounting purposes as well.

A detailed risk assessment is important for VSTRS because:

- The negative cash flow position of the System could be exacerbated by relatively small deviations from assumed future experience.
- Retired and inactive members account for more than half of the System's liabilities limiting options for reducing plan liabilities in the event of adverse experience.
- Most actuarial assumptions have been revised and updated since the last detailed risk analysis was performed.
- The risks identified below show significant potential for variability.

The following risks could significantly affect the System'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 \$195.1 million in the asset value. A 10% increase in assets would cause the unfunded liability (market value basis) to decrease from \$2.018 billion to \$1.823 billion. Likewise, a 10% decrease in the asset value, would cause the unfunded liability to increase from \$2.018 billion to \$2.213 billion.

Since the System'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 0.22%, disregarding the effects of the five-year phase-in of investment gains and losses.

Section 2: Actuarial Valuation Results

- To illustrate the potential for future investment volatility, the market value rate of return over the last 13 years has ranged from a low of -20.49% to a high of 20.97%.
- **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 VSTRS, a 3% liability increase would result in an increase in the unfunded accrued liability of \$119.1 million. The unfunded accrued liability (market value of assets basis) would increase from \$2.018 billion to \$2.137 billion.
- **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 System's actual experience. Over the past 13 years:
 - The investment gain(loss) for a year (actuarial basis) has ranged from a loss of \$312.7 million to a gain of \$23.7 million.
 - The non-investment gain(loss) for a year has ranged from a loss of \$86.0 million to a gain of \$30.2 million.
 - The funded percentage on the actuarial value of assets has ranged from a low of 51.29% to a high of 66.46% over the past ten years.

Section 2: Actuarial Valuation Results

- **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 0.76 to a high of 1.07. Currently the System has a non-active to active member ratio of 1.07.
- As of June 30, 2020, the retired life actuarial accrued liability represents 61% of the total actuarial accrued liability. In addition, the actuarial accrued liability for inactive 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 \$33.3 million more than contributions received, or 1.7% of the market value of assets. As the System matures, more cash will be needed from the investment portfolio to meet benefit payments.

Supplemental Information

Exhibit A: Table of Plan Coverage

Category	Year Ended June 30		Change From Prior Year
	2020	2019	
Active members in valuation:			
• Number	9,996	9,862	1.4%
• Average age	45.4	45.7	-0.3
• Average years of service	12.4	12.7	-0.3
• Total payroll	\$645,902,984	\$624,908,253	3.4%
• Average payroll	64,616	63,365	2.0%
• Total active vested members	7,463	7,424	0.5%
Inactive vested members			
• Number of deferreds as reported by the System	887	819	8.3%
• Number of inactives as reported by the System	2,710	2,756	-1.7%
Retired Members:			
• Number in pay status	9,164	8,867	3.3%
• Average age	72.5	72.2	0.3
• Average monthly benefit	\$1,838	\$1,778	3.4%
Disabled retirees:			
• Number in pay status	176	173	1.7%
• Average age	68.9	68.6	0.3
• Average monthly benefit	\$1,443	\$1,397	3.3%
Beneficiaries:			
• Number in pay status	503	474	6.1%
• Average age	74.1	73.5	0.6
• Average monthly benefit	\$1,188	\$1,158	2.6%

Section 3: Supplemental Information

Exhibit B: Reconciliation of Member Data

	Active Members	Deferred	Inactives	Disability Retirees	Retired Members	Beneficiaries	Total
Number as of July 1, 2019	9,862	819	2,756	173	8,867	474	22,951
• New members	726	N/A	145	0	6	N/A	877
• Inactives as reported by the System	-603	19	584	N/A	N/A	N/A	0
• Deferreds as reported by the System	N/A	105	-105	N/A	N/A	N/A	0
• Retirements	-398	-39	-25	N/A	462	N/A	0
• New disabilities	-8	0	0	8	0	N/A	0
• Return to work from disability	0	N/A	N/A	0	N/A	N/A	0
• Died with beneficiary	-2	0	-1	0	-44	47	0
• Died without beneficiary	-3	-1	-1	-5	-126	-22	-158
• Refund of contributions	-38	-7	-187	0	0	0	-232
• Rehire	461	-9	-451	N/A	-1	N/A	0
• Certain period expired	N/A	N/A	0	0	0	-2	-2
• Data adjustments	-1	0	-5	0	0	6	0
Number as of July 1, 2020	9,996	887	2,710	176	9,164	503	23,436

Section 3: Supplemental Information

Exhibit C: Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended June 30, 2020	Year Ended June 30, 2019
Net assets at market value at the beginning of the year	\$1,904,488,565	\$1,832,372,553
Contribution income:		
• Employer contributions	\$126,941,582	\$119,174,913
• Member contributions	40,598,283	39,075,342
• Less administrative expenses	<u>-2,814,955</u>	<u>-2,714,661</u>
<i>Net contribution income</i>	<i>\$164,724,910</i>	<i>\$155,535,594</i>
Net other income	\$408,259	\$348,096
Investment income:		
• Interest, dividends and other income	\$17,643,553	\$24,380,954
• Asset appreciation	68,060,321	89,423,357
• Less investment fees	<u>-2,598,556</u>	<u>-4,375,164</u>
<i>Net investment income</i>	<i>\$83,105,318</i>	<i>\$109,429,147</i>
Total income available for benefits	\$248,238,487	\$265,312,837
Less benefit payments:		
• Benefits	-\$198,755,235	-\$189,875,739
• Refunds of contributions	-1,885,974	-2,672,047
• Death claims	-546,743	-530,077
• Transfers to other pension trust funds	<u>-49,218</u>	<u>-118,962</u>
<i>Net benefit payments</i>	<i>-\$201,237,170</i>	<i>-\$193,196,825</i>
Change in reserve for future benefits	\$47,001,317	\$72,116,012
Net assets at market value at the end of the year	\$1,951,489,882	\$1,904,488,565

Section 3: Supplemental Information

Exhibit D: Summary Statement of Plan Assets

	June 30, 2020	June 30, 2019
Cash equivalents	\$23,670,208	\$14,500,204
Total accounts receivable	52,652,312	143,964,514
Prepaid expenses	72,007	62,394
Capital assets, net of depreciation	1,176,697	1,485,741
Investments:		
• Fixed income	\$130,276,831	\$149,877,676
• Equities	145,129,679	145,672,975
• Mutual and commingled funds	1,399,433,006	1,415,305,263
• Real estate and venture capital	<u>258,638,945</u>	<u>175,573,584</u>
Total investments at market value	\$1,933,478,461	\$1,886,429,498
Total assets	\$2,011,049,685	\$2,046,442,351
Total liabilities	-\$59,559,803	-\$141,953,786
Net assets at market value	\$1,951,489,882	\$1,904,488,565
Net assets at actuarial value	\$2,035,713,611	\$1,950,859,980

Section 3: Supplemental Information

Exhibit E: Development of the Fund through June 30, 2020

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
2010							\$1,305,250,049	\$1,410,368,434	108.05%
2011	\$50,268,131	\$32,062,253	\$208,107	\$261,886,312	-\$20,149,407	-\$108,758,513	1,520,766,932	1,486,698,448	97.76%
2012	56,152,011	31,827,995	85,110	24,726,665	-22,224,879	-119,713,933	1,491,619,901	1,517,410,471	101.73%
2013	65,086,320	32,343,368	292,953	120,403,032	-24,139,941	-131,254,070	1,554,351,563	1,552,924,370	99.91%
2014	72,668,413	32,558,584	410,500	212,338,194	-26,115,813	-140,846,837	1,705,364,604	1,610,285,523	94.42%
2015	72,908,805	34,863,531	830,887	-7,566,696	-2,551,845	-150,732,845	1,653,116,441	1,662,345,707	100.56%
2016	76,947,869	35,408,763	464,668	19,877,270	-2,163,853	-162,751,409	1,620,899,749	1,716,296,235	105.89%
2017	82,887,174	36,142,411	241,526	173,166,614	-2,623,838	-172,156,063	1,738,557,573	1,779,592,227	102.36%
2018	114,598,921	37,888,566	468,500	125,566,281	-2,448,365	-182,258,923	1,832,372,553	1,866,120,413	101.84%
2019	119,174,913	39,075,342	348,096	109,429,147	-2,714,661	-193,196,825	1,904,488,565	1,950,859,980	102.43%
2020	126,941,582	40,598,283	408,259	83,105,318	-2,814,955	-201,237,170	1,951,489,882	2,035,713,611	104.32%

* On a market basis, net of investment fees

** Includes depreciation and health/life insurance expenses (2014 and prior)

*** Includes "other expenses"

Section 3: Supplemental Information

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:	Actuarial Present Value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants 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):	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: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Section 3: Supplemental Information

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 System'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 intended to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Section 3: Supplemental Information

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; <u>Mortality rates</u> - the death rates of employees and pensioners; life expectancy is based on these rates; <u>Retirement rates</u> - the rate or probability of retirement at a given age; <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; <u>Salary increase rates</u> - the rates of salary increase due to inflation and productivity growth.
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 Ratio:	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.

Section 3: Supplemental Information

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.

Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions, Methods, and Models

Rationale for Assumptions:	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study dated September 24, 2020 (as prepared by Segal).	
Inflation:	2.30%	
Investment Return:	7.00% 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 System's target asset allocation.	
Salary Increases:	Age	Annual Rate of Salary Increase (%)
	20	10.50%
	25	9.50%
	30	6.50%
	35	5.95%
	40	5.30%
	45	4.50%
	50	4.20%
	55	3.80%
	60	3.55%

Section 4: Actuarial Valuation Basis

Cost-of-Living Adjustments:	<p>Assumed to occur on January 1 following one year of retirement at the rate of 2.40% per annum for Group A members and 1.35% per annum for Group C members (beginning at age 62 for Group C members who elect reduced early retirement). The January 1, 2021 COLA is assumed to be 0.00% for group A and 1.00% for groups B and C.</p>																																																					
Mortality Rates:	<p><i>Pre-retirement:</i></p> <ul style="list-style-type: none"> All Groups PubT-2010 Teacher Employee Amount-Weighted Table with generational projection using scale MP-2019. <p><i>Healthy Post-retirement - Retirees:</i></p> <ul style="list-style-type: none"> All Groups PubT-2010 Teacher Healthy Retiree Amount-Weighted Table with generational projection using scale MP-2019. <p><i>Healthy Post-retirement - Beneficiaries:</i></p> <ul style="list-style-type: none"> All Groups 109% of the Pub-2010 Contingent Survivor Amount-Weighted Table with generational projection using scale MP-2019. <p><i>Disabled Post-retirement:</i></p> <ul style="list-style-type: none"> All Groups PubNS-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table with generational projection using scale MP-2019. <p>The tables with the generational projection to the ages of members as of the measurement date reasonably reflect the mortality experience of the System as of the measurement date. The mortality tables were then adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.</p>																																																					
Separation from Service before Retirement (Due to Withdrawal and Disability):	<p>Representative values of the assumed annual rates of withdrawal and disability are as follows:</p> <table border="1"> <thead> <tr> <th rowspan="3">Age</th> <th colspan="4">Rate (%)</th> </tr> <tr> <th colspan="2">Withdrawal</th> <th colspan="2">Disability</th> </tr> <tr> <th>Male</th> <th>Female</th> <th>Male</th> <th>Female</th> </tr> </thead> <tbody> <tr> <td>25</td> <td>7.80%</td> <td>8.30%</td> <td>0.005%</td> <td>0.008%</td> </tr> <tr> <td>30</td> <td>5.20</td> <td>5.40</td> <td>0.007</td> <td>0.008</td> </tr> <tr> <td>35</td> <td>3.10</td> <td>3.25</td> <td>0.009</td> <td>0.008</td> </tr> <tr> <td>40</td> <td>2.20</td> <td>2.15</td> <td>0.014</td> <td>0.011</td> </tr> <tr> <td>45</td> <td>1.85</td> <td>1.66</td> <td>0.023</td> <td>0.024</td> </tr> <tr> <td>50</td> <td>1.75</td> <td>1.54</td> <td>0.060</td> <td>0.074</td> </tr> <tr> <td>55</td> <td>1.60</td> <td>1.50</td> <td>0.040</td> <td>0.050</td> </tr> <tr> <td>60</td> <td>1.50</td> <td>1.50</td> <td>0.132</td> <td>0.088</td> </tr> </tbody> </table>	Age	Rate (%)				Withdrawal		Disability		Male	Female	Male	Female	25	7.80%	8.30%	0.005%	0.008%	30	5.20	5.40	0.007	0.008	35	3.10	3.25	0.009	0.008	40	2.20	2.15	0.014	0.011	45	1.85	1.66	0.023	0.024	50	1.75	1.54	0.060	0.074	55	1.60	1.50	0.040	0.050	60	1.50	1.50	0.132	0.088
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Section 4: Actuarial Valuation Basis

Retirement Rates:

Age	Group A		Group C Grandfathered	
	<30 Years of Service	30+ Years of Service	<30 Years of Service	30+ Years of Service
50	0.00%	40.00%	0.000%	40.00%
51	0.00%	20.00%	0.000%	20.00%
52	0.00%	20.00%	0.000%	20.00%
53	0.00%	20.00%	0.000%	20.00%
54	0.00%	20.00%	0.000%	20.00%
55	7.50%	20.00%	6.125%	10.00%
56	7.50%	10.00%	6.250%	10.00%
57	7.50%	10.00%	6.250%	10.00%
58	7.50%	10.00%	6.250%	10.00%
59	12.50%	10.00%	9.375%	15.00%
60	30.00%	100.00%	18.750%	25.00%
61	25.00%	100.00%	18.750%	17.00%
62	30.00%	100.00%	20.000%	100.00%
63	30.00%	100.00%	22.000%	100.00%
64	30.00%	100.00%	22.000%	100.00%
65	40.00%	100.00%	33.000%	100.00%
66	40.00%	100.00%	33.000%	100.00%
67	40.00%	100.00%	33.000%	100.00%
68	50.00%	100.00%	22.000%	100.00%
69	50.00%	100.00%	33.000%	100.00%
70+	100.000%	100.00%	100.000%	100.00%

Section 4: Actuarial Valuation Basis

Retirement Rates (continued):

Age	Group C Non-Grandfathered		
	Before Rule of 90	1 st Year after Rule of 90	1+ Years after Rule of 90
<56	5.00%	30.00%	20.00%
56	5.00%	30.00%	10.00%
57	5.00%	30.00%	10.00%
58	5.00%	30.00%	10.00%
59	7.50%	30.00%	15.00%
60	10.00%	30.00%	15.00%
61	15.00%	30.00%	20.00%
62	12.50%	30.00%	22.50%
63	20.00%	30.00%	22.50%
64	20.00%	30.00%	25.00%
65	40.00%	30.00%	40.00%
66	30.00%	30.00%	30.00%
67	30.00%	30.00%	30.00%
68	30.00%	30.00%	30.00%
69	30.00%	30.00%	30.00%
70+	100.00%	100.00%	100.00%

Inactive Members as Reported by the System:

Not Vested: Valuation liability equals 100% of accumulated contributions.

Vested: Valuation liability based on accrued benefit and assumed to retire as follows:

- Group A and Group C-GF: 10% of members are assumed to retire from Early Retirement Age for each year until Normal Retirement Age, then 100% of members are assumed to retire at their Normal Retirement Age.
- Group C-NGF: 50% of members are assumed to retire from age 62-69, then 100% at age 70.

Deferred Members as Reported by the System:

Valuation liability based on accrued benefit and assumed to retire as follows:

- Group A and Group C-GF: 10% of members are assumed to retire from Early Retirement Age for each year until Normal Retirement Age, then 100% of members are assumed to retire at their Normal Retirement Age.
- Group C-NGF: 50% of members are assumed to retire from age 62-69, then 100% at age 70.

Future Administrative Expenses:

No provisions made.

Section 4: Actuarial Valuation Basis

Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Percent Married:	85% of male members and 35% of female members are assumed to be married.
Age of Spouse:	Females three years younger than males.
Benefit Elections:	All members are assumed to elect the single life annuity option.
Actuarial 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.
Modeling:	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Deterministic cost projections are based on a proprietary forecasting model. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.
Justification for Changes in Actuarial Assumptions:	<p>Based on reviews of economic assumptions and demographic assumptions in the experience study completed in September of 2020, the following actuarial assumptions were changed:</p> <ul style="list-style-type: none">• Inflation• Investment Return• Salary Scale• COLA• Mortality• Retirement (Active, Inactive, and Disability)• Termination <p>For more information on how these assumptions were changed, please refer to the Vermont State Employees' Retirement System Experience Review presentation that was completed in September of 2020.</p>

Section 4: Actuarial Valuation Basis

Exhibit II: Summary of Plan Provisions

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

Effective Date:	July 1, 1947.				
Creditable Service:	Service as a member plus purchased service.				
Average Final Compensation (AFC):	<ul style="list-style-type: none"> Average annual compensation during highest 3 consecutive years. 				
Grandfathered Status:	<ul style="list-style-type: none"> Group C members who were within five years of normal retirement eligibility as defined prior to July 1, 2010, are “grandfathered”. 				
Normal Retirement - Eligibility:	<ul style="list-style-type: none"> Group A Age 60 or 30 years of creditable service. Group C <table border="0"> <tr> <td>Grandfathered</td> <td>Age 62 or 30 years of creditable service</td> </tr> <tr> <td>Non-grandfathered</td> <td>Age 65 or age plus creditable service equal to 90.</td> </tr> </table> 	Grandfathered	Age 62 or 30 years of creditable service	Non-grandfathered	Age 65 or age plus creditable service equal to 90.
Grandfathered	Age 62 or 30 years of creditable service				
Non-grandfathered	Age 65 or age plus creditable service equal to 90.				
Normal Retirement - Amount:	<ul style="list-style-type: none"> Group A Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/60th of AFC times creditable service. Group C <table border="0"> <tr> <td>Grandfathered</td> <td>Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80th of AFC times creditable service prior to July 1, 1990, plus 1/60th of AFC times creditable service after July 1, 1990.</td> </tr> <tr> <td>Non-grandfathered</td> <td>Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80th of AFC times creditable service prior to July 1, 1990, plus 1/60th of AFC times creditable service after July 1, 1990 up to 20 years of service, plus 1/50th of AFC for years of service after 20. If a member already has 20 or more years of service on June 30, 2010, the 1/50th will be applied to all service accrued after July 1, 2010.</td> </tr> </table> <p>Minimum benefit applicable to Group A of \$6,600 after 30 years of creditable service (pro-rata for service less than 30 years).</p> <p>Maximum benefit applicable to Group C: Grandfathered maximum benefit is 50% of AFC up to June 30, 2010. May continue to accrue up to 53.34% of AFC with service earned after July 1, 2010. Non-grandfathered maximum benefit is 60% of AFC.</p> 	Grandfathered	Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80 th of AFC times creditable service prior to July 1, 1990, plus 1/60 th of AFC times creditable service after July 1, 1990.	Non-grandfathered	Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80 th of AFC times creditable service prior to July 1, 1990, plus 1/60 th of AFC times creditable service after July 1, 1990 up to 20 years of service, plus 1/50 th of AFC for years of service after 20. If a member already has 20 or more years of service on June 30, 2010, the 1/50 th will be applied to all service accrued after July 1, 2010.
Grandfathered	Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80 th of AFC times creditable service prior to July 1, 1990, plus 1/60 th of AFC times creditable service after July 1, 1990.				
Non-grandfathered	Member annuity based on accumulated contributions plus a pension, which, with member annuity, equals 1/80 th of AFC times creditable service prior to July 1, 1990, plus 1/60 th of AFC times creditable service after July 1, 1990 up to 20 years of service, plus 1/50 th of AFC for years of service after 20. If a member already has 20 or more years of service on June 30, 2010, the 1/50 th will be applied to all service accrued after July 1, 2010.				
Early Retirement – Eligibility:	<ul style="list-style-type: none"> Group A Age 55. Group C Age 55 with 5 years of creditable service. 				

Section 4: Actuarial Valuation Basis

Early Retirement – Amount:	<ul style="list-style-type: none"> • Group A Actuarial equivalent of normal retirement allowance using AFC and creditable service at early retirement. • Group C Grandfathered Accrued normal benefit reduced 6% for each year prior to age 62. Non-grandfathered Accrued normal benefit reduced by actuarial reduction from normal retirement age.
Vesting:	<ul style="list-style-type: none"> • All groups – 5 years of creditable service. • Allowance beginning at age 60 calculated as a normal retirement allowance based on AFC and creditable service at termination.
Disability Retirement - Eligibility:	All groups – Total and permanent disability after 5 years of creditable service (5 years preceding retirement served in State).
Disability Retirement - Amount:	All groups – Calculated as a service allowance based on AFC and creditable service at disability retirement, subject to a 25% of AFC minimum.
Death Benefit - Eligibility:	<ul style="list-style-type: none"> • Group A Age 60 or 30 years of creditable service; 10 years of creditable service if in service at death. • Group C Age 55 and 5 years of creditable service or 10 years of creditable service.
Death Benefit - Amount:	All groups – Accrued allowance paid under 100% survivorship option. If the eligibility requirements are not met or if beneficiary so elects, the member's accumulated contributions are paid to the beneficiary or estate. Certain children's benefits may also be payable.
Post-Retirement Adjustments:	<ul style="list-style-type: none"> • Group A Allowances in payment for at least one year increased on each January 1 by the percentage increase in Consumer Price Index, but not more than 5%. • Group C Same, but increase is based on half of the Consumer Price Index increase. For members receiving a reduced early retirement allowance, the adjustment will not apply before age 62.
Refund of Contributions:	If no other beneficiary is payable, a terminated member receives his accumulated contributions with interest.
Member Contribution Rates:	<ul style="list-style-type: none"> • Group A 5.5% of earnable compensation. Contributions stop after 25 years of creditable service. • Group C 5% of earnable compensation with at least five years of service as of July 1, 2014. 6% of earnable compensation with less than five years of service as of July 1, 2014.
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

Additional Summary Tables of Member Data

Table 1: Members in Active Service as of June 30, 2020 by Age, Years of Service, and Average Payroll – All Employee Groups

Age	Years of Service								
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 & over
Under 25	182	182	--	--	--	--	--	--	--
	\$40,424	\$40,424	--	--	--	--	--	--	--
25 - 29	732	581	151	--	--	--	--	--	--
	\$46,820	\$45,797	\$50,753	--	--	--	--	--	--
30 - 34	1,150	477	565	108	--	--	--	--	--
	\$53,943	\$50,493	\$55,666	\$60,166	--	--	--	--	--
35 - 39	1,319	366	463	398	92	--	--	--	--
	\$59,469	\$52,341	\$59,110	\$64,341	\$68,558	--	--	--	--
40 - 44	1,474	305	308	404	360	97	--	--	--
	\$65,108	\$51,785	\$61,450	\$68,358	\$73,189	\$75,089	--	--	--
45 - 49	1,516	230	233	272	356	365	60	--	--
	\$69,686	\$53,867	\$62,091	\$68,482	\$74,906	\$78,136	\$82,910	--	--
50 - 54	1,413	181	177	239	222	299	233	61	1
	\$72,278	\$57,125	\$64,049	\$68,697	\$75,083	\$78,281	\$80,886	\$82,337	\$90,073
55 - 59	1,182	110	123	179	199	216	190	138	27
	\$73,230	\$57,437	\$61,979	\$69,540	\$73,113	\$78,081	\$81,255	\$80,652	\$80,937
60 - 64	783	74	78	98	154	137	94	73	75
	\$71,623	\$57,220	\$58,623	\$64,317	\$71,310	\$77,908	\$79,822	\$80,408	\$79,232
65 & over	245	27	20	39	43	42	16	18	40
	\$71,099	\$47,195	\$64,657	\$69,776	\$68,249	\$72,802	\$80,049	\$76,535	\$86,994
Total	9,996	2,533	2,118	1,737	1,426	1,156	593	290	143
	\$64,616	\$50,358	\$58,877	\$66,920	\$73,251	\$77,687	\$81,018	\$80,689	\$81,801

Section 5: Additional Summary Tables of Member Data

Table 2: Summary of Retired Members and Beneficiary Data by Benefit Amount – All Teachers

Allowance Level	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
0 – 500	5	\$890	0	\$0	0	\$0
501 – 1,000	8	6,209	0	0	0	0
1,001 – 1,500	26	32,463	0	0	2	2,634
1,501 – 2,000	37	66,426	0	0	8	14,463
2,001 – 2,500	73	165,278	0	0	6	13,328
2,501 – 3,000	109	301,661	0	0	10	26,693
3,001 – 3,500	112	361,328	0	0	7	23,078
3,501 – 4,000	130	485,217	0	0	6	22,996
4,001 – 4,500	145	618,053	0	0	10	42,385
4,501 – 5,000	138	653,240	0	0	10	47,956
5,001 – 5,500	146	765,393	0	0	11	58,510
5,501 – 6,000	156	897,982	0	0	8	46,474
6,001 – 6,500	118	737,983	0	0	9	56,620
6,501 – 7,000	134	904,152	0	0	12	81,141
7,001 – 7,500	133	962,087	2	14,363	15	108,712
7,501 – 8,000	106	821,674	1	7,788	11	85,686
8,001 – 8,500	112	924,171	3	24,640	14	116,046
8,501 – 9,000	112	978,998	1	8,943	7	61,193
9,001 – 9,500	109	1,008,679	5	46,756	20	185,393
9,501 – 10,000	130	1,265,136	3	29,672	22	214,321
10,001 – 10,500	127	1,303,235	6	61,428	10	102,637
10,501 – 11,000	98	1,054,948	8	85,843	17	183,711
11,001 – 11,500	123	1,384,021	12	135,504	18	203,324
11,501 – 12,000	143	1,680,467	6	71,010	11	129,822
12,001 – 12,500	108	1,320,869	9	110,162	13	159,484
12,501 – 13,000	120	1,528,078	4	50,921	19	242,735
13,001 – 13,500	81	1,073,705	3	39,397	15	198,896
13,501 – 14,000	104	1,430,054	8	109,242	6	82,801
14,001 – 14,500	90	1,283,177	11	156,196	8	114,117
14,501 – 15,000	100	1,475,046	2	29,501	7	102,778

Section 5: Additional Summary Tables of Member Data

Table 2: Summary of Retired Members and Beneficiary Data by Benefit Amount – All Teachers (continued)

Allowance Level	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
15,001 – 15,500	91	\$1,386,874	5	\$76,259	12	\$183,675
15,501 – 16,000	105	1,652,568	4	62,863	8	125,548
16,001 – 16,500	104	1,691,018	6	97,284	9	146,437
16,501 – 17,000	91	1,525,272	4	66,825	5	83,942
17,001 – 17,500	94	1,621,360	5	86,369	11	189,435
17,501 – 18,000	106	1,881,888	2	35,654	7	123,958
18,001 – 18,500	91	1,661,163	4	72,807	9	164,150
18,501 – 19,000	112	2,099,869	4	74,919	6	112,778
19,001 – 19,500	110	2,117,835	3	57,720	9	172,841
19,501 – 20,000	95	1,876,199	2	39,315	8	158,074
20,001 – 20,500	105	2,125,877	4	81,474	6	121,868
20,501 – 21,000	95	1,968,858	6	124,445	6	124,497
21,001 – 21,500	113	2,402,983	2	42,887	7	148,377
21,501 – 22,000	108	2,349,731	3	65,581	6	130,735
22,001 – 22,500	130	2,893,850	2	44,299	6	132,641
22,501 – 23,000	132	3,004,961	5	113,541	7	159,845
23,001 – 23,500	117	2,722,737	3	69,806	3	69,492
23,501 – 24,000	145	3,443,301	3	71,346	1	23,897
24,001 – 24,500	145	3,512,378	2	48,596	1	24,126
24,501 – 25,000	126	3,117,165	0	0	1	24,903
25,001 – 25,500	127	3,205,450	0	0	3	75,749
25,501 – 26,000	116	2,984,298	1	25,534	1	25,842
26,001 – 26,500	114	2,993,181	3	78,897	5	130,971
26,501 – 27,000	134	3,586,233	0	0	2	53,319
27,001 – 27,500	119	3,243,909	0	0	2	54,289
27,501 – 28,000	126	3,498,142	2	55,190	2	55,759
28,001 – 28,500	112	3,162,697	1	28,073	5	141,474
28,501 – 29,000	139	3,999,454	0	0	2	57,283
29,001 – 29,500	131	3,831,356	2	58,699	4	117,096
29,501 – 30,000	129	3,838,990	1	29,727	3	88,805

Section 5: Additional Summary Tables of Member Data

Table 2: Summary of Retired Members and Beneficiary Data by Benefit Amount – All Teachers (continued)

Allowance Level	Service Pensioners		Disability Pensioners		Beneficiaries	
	Number	Annual Allowance	Number	Annual Allowance	Number	Annual Allowance
30,001 – 30,500	131	\$3,961,343	2	\$60,347	3	\$91,043
30,501 – 31,000	109	3,351,467	0	0	0	0
31,001 – 31,500	112	3,501,758	0	0	2	62,560
31,501 – 32,000	97	3,079,798	1	31,663	0	0
32,001 – 32,500	109	3,514,700	1	32,204	3	96,811
32,501 – 33,000	117	3,830,629	0	0	3	98,395
33,001 – 33,500	102	3,391,748	1	33,222	2	66,706
33,501 – 34,000	112	3,781,815	0	0	1	33,935
34,001 – 34,500	89	3,049,253	2	68,594	2	68,256
34,501 – 35,000	105	3,649,423	1	34,806	1	34,562
35,001 – 35,500	116	4,087,672	0	0	3	105,750
35,501 – 36,000	91	3,252,527	1	35,807	3	107,812
36,001 – 36,500	83	3,008,080	0	0	1	36,136
36,501 – 37,000	68	2,499,551	0	0	1	36,840
37,001 – 37,500	73	2,718,164	1	37,368	0	0
37,501 – 38,000	77	2,905,692	0	0	5	188,593
38,001 – 38,500	68	2,601,757	0	0	0	0
38,501 – 39,000	62	2,403,134	0	0	0	0
39,001 – 39,500	64	2,510,368	1	39,253	0	0
39,501 – 40,000	57	2,264,594	0	0	0	0
Over 40,000	727	33,814,043	2	85,036	4	194,617
Total	9,164	\$202,067,735	176	\$3,047,774	503	\$7,171,756

Section 5: Additional Summary Tables of Member Data

Table 3A: Inactive Membership as of June 30, 2020 by Age, Years of Service, and Average Annual Allowance – Service Pensioners

Age	Years of Service at Retirement								
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 & over
Under 60	197	2	4	14	12	9	7	132	17
	\$33,216	\$3,992	\$3,138	\$4,976	\$10,859	\$11,678	\$13,587	\$40,890	\$42,667
60 - 64	856	11	22	60	86	94	107	372	104
	\$29,255	\$10,781	\$4,708	\$7,311	\$12,923	\$17,707	\$35,618	\$36,548	\$40,373
65 - 69	2,601	26	215	335	375	364	272	707	307
	\$23,661	\$9,368	\$5,978	\$8,448	\$15,036	\$21,643	\$31,925	\$32,933	\$38,107
70 - 74	2,685	32	171	418	336	372	258	823	275
	\$21,903	\$6,732	\$5,977	\$8,394	\$14,121	\$20,282	\$27,228	\$30,001	\$36,570
75 - 79	1,542	29	81	256	206	227	138	477	128
	\$19,050	\$4,547	\$6,166	\$7,547	\$11,989	\$17,708	\$22,738	\$26,832	\$34,260
80 - 84	699	22	23	119	110	125	77	153	70
	\$17,323	\$3,764	\$5,693	\$7,320	\$11,311	\$15,484	\$21,367	\$25,720	\$32,337
85 - 89	380	11	18	47	53	50	52	99	50
	\$16,319	\$2,321	\$5,681	\$7,004	\$11,055	\$13,982	\$16,122	\$22,656	\$27,560
90 & over	204	8	15	37	33	38	19	39	15
	\$11,990	\$3,726	\$3,285	\$5,941	\$9,009	\$11,439	\$12,620	\$20,508	\$25,035
Total	9,164	141	549	1,286	1,211	1,279	930	2,802	966
	\$22,050	\$6,068	\$5,839	\$7,931	\$13,396	\$18,985	\$27,394	\$30,958	\$36,317

Section 5: Additional Summary Tables of Member Data

Table 3B: Inactive Membership as of June 30, 2020 by Age, Years of Service, and Average Annual Allowance – Disability Pensioners

Age	Years of Service at Retirement								
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 & over
Under 60	22	--	3	3	5	6	4	1	--
	\$20,791	--	\$11,192	\$13,827	\$16,668	\$21,763	\$32,294	\$39,253	--
60 - 64	40	--	4	9	11	12	4	--	--
	\$19,322	--	\$13,287	\$15,501	\$16,779	\$24,966	\$24,020	--	--
65 - 69	43	--	8	14	11	8	2	--	--
	\$16,129	--	\$11,098	\$12,284	\$14,348	\$26,453	\$31,670	--	--
70 - 74	29	--	5	4	4	9	7	--	--
	\$17,181	--	\$13,281	\$11,582	\$18,187	\$16,958	\$22,880	--	--
75 - 79	22	--	1	7	4	6	4	--	--
	\$16,337	--	\$19,665	\$14,387	\$12,904	\$16,198	\$22,562	--	--
80 - 84	12	--	--	2	4	3	3	--	--
	\$13,178	--	--	\$9,849	\$11,539	\$11,089	\$19,672	--	--
85 - 89	5	--	--	--	1	2	2	--	--
	\$14,015	--	--	--	\$20,918	\$8,515	\$16,064	--	--
90 & over	3	--	--	--	2	--	--	1	--
	\$12,678	--	--	--	\$12,459	--	--	\$13,117	--
Total	176	--	21	39	42	46	26	2	--
	\$17,317	--	\$12,456	\$13,326	\$15,288	\$20,476	\$24,236	\$26,185	--

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