



Matthew A. Strom FSA, MAAA, EA  
Senior Vice President, Actuary  
mstrom@segalco.com

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

November 16, 2021

**Via Email [CRupe@leg.state.vt.us](mailto:CRupe@leg.state.vt.us)**

Mr. Chris Rupe  
Fiscal Analyst  
Joint Fiscal Office

**Re: Request 4 – Actuarial Modeling of Individual Scenarios for VSERS Group F, VSERS Group C, and VSTRS**

Dear Chris:

As requested by the Pension Task Force, we have calculated the impact of potential changes to financing mechanisms and provisions affecting certain members of the Vermont State Employees' Retirement System (VSERS) and the Vermont State Teachers' Retirement System (VSTRS). The revenue scenarios include various combination of one-time revenue sources, recurring revenue sources, and changes to member contribution rates. The plan changes include various changes to the post-retirement benefit increase/COLA provisions and the maximum benefits payable. The results of the June 30, 2020, actuarial valuation, projected forward on an open group basis, are used as a baseline.

For the revenue scenarios, we show the additional State revenue for each year from FY22-FY38, the impact on the estimated actuarially determined contribution (ADC) for FY23 if the member contribution rate changes were effective as of the beginning of FY22, the present value<sup>1</sup> of the additional member contributions from FY23-FY38, the present value of the decrease in the employer contributions from FY23-FY38, and the impact on the projected amortization payments from FY22-FY38.

We have calculated the impact of the plan change scenarios on the actuarial accrued liability, unfunded actuarial accrued liability, funded percentage, normal cost, and the estimated FY23 ADC<sup>2</sup>. We have also included the impact on the projected amortization payments from FY22-FY38.

For the plan change scenarios, including the COLA scenarios, we have calculated the impact that these changes would have on current active members only as of the June 30, 2020, valuation date, as indicated in the request.

The results of this analysis are shown in the pages following this letter.

<sup>1</sup> Present values are calculated as of June 30, 2020, to be consistent with the date of the actuarial valuation this analysis is based on.

<sup>2</sup> Since the actual FY23 contribution was determined with the recently-completed June 30, 2021, actuarial valuation, comparisons of the estimated FY23 ADCs in this analysis are provided for illustrative purposes only.

## VSERS Group F Scenarios

**Revenue Scenarios** – Assume that additional one-time and recurring revenue sources are enacted and that the proceeds are applied toward the unfunded actuarial accrued liability, in combination with varying member contribution rate changes under the following scenarios:

Revenue Scenario	One-Time Revenue	Recurring Revenue	Description of Member Contribution Changes
Rev-A	\$75M	\$15M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>3 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23.
Rev-B	50M	40M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>3 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23.
Rev-C	75M	15M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>5 years</b> beginning in FY23.
Rev-D	50M	40M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>5 years</b> beginning in FY23.

Revenue Scenario assumptions:

- One-time revenue
  - Additional funds paid June 30, 2022, and are in addition to ADCs
  - Additional funds factored into all subsequent ADCs
- Recurring revenue
  - Enacted during 2022 Legislative Session and will take effect January 1, 2023
    - Only 5/12ths of annual revenue collected in FY23
    - First full year of annual revenue in FY24, with 2% annual increases thereafter
  - All future actuarially determined contributions (ADCs) are fully funded
  - Additional funds paid annually on June 30<sup>th</sup>, and are in addition to ADCs
  - Additional funds factored into all subsequent ADCs
  - No additional funds after System achieves 100% funding
- Member Contribution changes
  - The salary percentiles used for this analysis are as follows:
    - 25<sup>th</sup> Percentile: \$50,000
    - 75<sup>th</sup> Percentile: \$75,000
  - Contribution rates are applied to a member’s entire salary

**Plan Change Scenarios** – In addition to the revenue scenarios above, the following plan change scenarios were prepared:

<b>Plan Change Scenario</b>	<b>Description of Plan Changes</b>
<b>PC-1</b>	Cost-of-Living-Adjustment (COLA) Threshold – Members only receive a COLA on the first \$24,000 of their annual pension income.
<b>PC-2</b>	Increasing COLA Threshold – Members only receive a COLA on the first \$24,000 of their annual pension income, where the \$24,000 threshold is indexed to increase annually by the Consumer-Price-Index (CPI) from FY24 onward.
<b>PC-3</b>	CPI thresholds are updated to reflect a 0% minimum and a 4% maximum.
<b>PC-4</b>	Members will not receive a COLA until they have been retired for at least 24 months.
<b>PC-5</b>	Members will not receive a COLA until they have been retired for at least 36 months.
<b>PC-6</b>	Increase the Max Benefit Cap by 1% of Average Final Compensation (AFC) for each year worked beyond 30 years (Old Group F) and 36 years (New Group F), applied prospectively to service actually worked after July 1, 2022.

Plan Change Scenario assumptions:

- PC-2
  - The \$24,000 threshold is assumed to increase annually by 2.30% (current assumption for inflation/CPI)
- PC-3
  - Decrease the annual COLA assumption from 2.40% to 2.25%<sup>3</sup>
- PC-6
  - Old Group F: Group F members who were hired before July 1, 2008
  - New Group F: Group F members who were hired on or after July 1, 2008

### **VSERS Group C Scenarios**

**Revenue Scenarios** – Assume that additional one-time and recurring revenue sources are enacted and that the proceeds are applied toward the unfunded actuarial accrued liability, in combination with varying member contribution rate changes under the following scenarios:

<sup>3</sup> The stochastic analysis of inflation combined with the current minimum and maximum thresholds used in connection with the 2020 Experience Study Review was rerun with the thresholds identified in PC-3. The outcome was a reduction of approximately 0.15% in the 50<sup>th</sup> percentile long-term average COLA.

Revenue Scenario	One-Time Revenue	Recurring Revenue	Description of Member Contribution Changes
Rev-A	\$75M	\$15M	Increase member contribution rate by 0.45% per year for 3 years beginning in FY23.
Rev-B	50M	40M	Increase member contribution rate by 0.45% per year for 3 years beginning in FY23.
Rev-C	75M	15M	25 <sup>th</sup> -49 <sup>th</sup> salary percentile: Increase member contribution rate to 9.0% beginning in FY23. 50 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate to 10.0% beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate to 11.0% beginning in FY23.
Rev-D	50M	40M	25 <sup>th</sup> -49 <sup>th</sup> salary percentile: Increase member contribution rate to 9.0% beginning in FY23. 50 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate to 10.0% beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate to 11.0% beginning in FY23.

Revenue Scenario assumptions:

- One-time revenue
  - Additional funds paid June 30, 2022, and are in addition to ADCs
  - Additional funds factored into all subsequent ADCs
- Recurring revenue
  - Enacted during 2022 Legislative Session and will take effect January 1, 2023
    - Only 5/12ths of annual revenue collected in FY23
    - First full year of annual revenue in FY24, with 2% annual increases thereafter
  - All future actuarially determined contributions (ADCs) are fully funded
  - Additional funds paid annually on June 30<sup>th</sup>, and are in addition to ADCs
  - Additional funds factored into all subsequent ADCs
  - No additional funds after System achieves 100% funding
- Contribution changes
  - The salary percentiles used for this analysis are as follows:
    - 25<sup>th</sup> Percentile: \$73,000
    - 50<sup>th</sup> Percentile: \$89,000
    - 75<sup>th</sup> Percentile: \$106,000
  - Contribution rates are applied to a member’s entire salary

**Plan Change Scenarios** – In addition to the revenue scenarios above, the following plan change scenarios were prepared:

Plan Change Scenario	Description of Plan Changes
PC-1	Increase the Max Benefit Cap by <b>1% of AFC</b> for each year worked beyond reaching the later of age 50 or 20 years of benefit service, applied prospectively to service actually worked after July 1, 2022. Increase mandatory retirement age to 57.
PC-2	Increase the Max Benefit Cap by <b>2% of AFC</b> for each year worked beyond reaching the later of age 50 or 20 years of benefit service, applied prospectively to service actually worked after July 1, 2022. Increase mandatory retirement age to 57.

Plan Change Scenario assumptions:

- PC-1 and PC-2
  - After increasing the mandatory retirement age to 57, the retirement rate assumptions were updated as follows: 50% at age 50, 10% at each age from age 51 through age 53, 5% at each age from age 54 through age 56, and 100% at age 57

### VSTRS Scenarios

**Revenue Scenarios** – Assume that additional one-time and recurring revenue sources are enacted and that the proceeds are applied toward the unfunded actuarial accrued liability, in combination with varying member contribution changes under the following scenarios:

Revenue Scenario	One-Time Revenue	Recurring Revenue	Description of Member Contribution Changes
Rev-A	\$97.5M	\$32.5M	Members currently paying <b>5%</b> : Increase member contribution rate by 0.25% per year for <b>4 years</b> beginning in <b>FY23</b> . Members currently paying <b>6%</b> : Increase member contribution rate by 0.25% per year for <b>2 years</b> beginning in <b>FY25</b> .
Rev-B	97.5M	50M	Replace current “flat” member contribution rates with “progressive” contribution rates beginning in FY23 as follows: -5.50% on the first \$40,000 of income -6.25% on income between \$40,000 and \$60,000 -7.00% on income between \$60,000 and \$80,000 -7.75% on income above \$80,000

Revenue Scenario assumptions:

- One-time revenue
  - Additional funds paid June 30, 2022, and are in addition to ADCs
  - Additional funds factored into all subsequent ADCs
- Recurring revenue
  - Enacted during 2022 Legislative Session and will take effect January 1, 2023
    - Only 5/12ths of annual revenue collected in FY23
    - First full year of annual revenue in FY24, with 2% annual increases thereafter

- All future actuarially determined contributions (ADCs) are fully funded
- Additional funds paid annually on June 30<sup>th</sup>, and are in addition to ADCs
- Additional funds factored into all subsequent ADCs
- No additional funds after System achieves 100% funding

**Plan Change Scenarios** – In addition to the revenue scenarios above, the following plan change scenarios were prepared:

Plan Change Scenario	Description of Plan Changes
<b>PC-1</b>	COLA Threshold - 50% of CPI on the first \$48,000 of annual pension income, 25% of CPI on annual pension income in excess of \$48,000.
<b>PC-2</b>	Tiered COLA - 100% of CPI on the first \$20,000 of annual pension income, 50% of CPI on annual pension income between \$20,000-\$40,000, 25% of CPI on annual pension income above \$40,000.
<b>PC-3</b>	Vested COLA - No COLA upon retirement unless a member has at least 15 years of benefit service.
<b>PC-4</b>	Increase the Max Benefit Cap by 1% of AFC for each year worked beyond 33.34 years (Group C2 only), applied prospectively to service actually worked after July 1, 2022.

Plan Change Scenario assumptions:

- PC-1 and PC-2
  - Apply the following COLA increase assumptions<sup>4</sup>:
    - 2.40% where 100% of CPI is applied
    - 1.35% where 50% of CPI is applied
    - 0.95% where 25% of CPI is applied
- PC-4
  - Group C2 (Non-Grandfathered): Group C members who were not within five years of normal retirement eligibility as defined prior to July 1, 2010

## Methodology

ADCs for a given fiscal year are determined based on the actuarial valuation from two years prior. For example, the actuarial valuation as of June 30, 2020 determined the ADC for the fiscal year ending June 30, 2022. Since the first payment under all revenue scenarios will be made during FY22 and included in the assets as of June 30, 2022, the exhibits for the revenue scenarios that illustrate projected amortization payments show the first decrease as a result of the additional revenue in the row corresponding to FY24. Since we are using the 2020 actuarial valuation, plan changes and changes in member contribution rates will first impact amortization payments in FY23.

<sup>4</sup> Note the 1% and 5% limits from 16 V.S.A. § 1949(c) are applied after the determination of 100%, 50%, and 25% of CPI. Except for when CPI is negative, in which case the COLA is 0%. The stochastic analysis of inflation combined with the current minimum and maximum thresholds used in connection with the 2020 Experience Study Review, which was used to determine the 2.40% and 1.35% assumptions, was rerun with the modifications identified in PC-2. The outcome at 25% of CPI was a reduction of approximately 1.45% in the 50th percentile long-term average COLA (relative to the outcome at 100% of CPI).

All member contribution rate changes are assumed to be effective July 1, 2022. Consequently, any increase in member contributions outlined in this analysis will reduce the ADC for FY23. The present value of the additional member contributions is equal to the sum of the additional member contributions from FY23-FY38 that arise from the member contribution changes, discounted using the current investment return assumption of 7.00%. The present value of the decrease in employer contributions is equal to the total reduction in employer contributions from FY23-FY38 due to the additional revenue amounts and the member contribution changes, discounted using the current investment return assumption of 7.00%.

Within each individual group/System, each of the individual plan change scenarios can be viewed as additive if combined with any of the individual revenue scenarios. For example, in order to estimate the impact of combining the individual plan change scenario PC-1 with the revenue scenario Rev-A, the impact of PC-1 can be added to the impact of Rev-A. Additionally, since the VSERS Group F plan change scenarios only impact active members in Group F and the VSERS Group C plan change scenarios only impact active members in Group C, any individual plan change scenario for VSERS Group F can be viewed as additive if combined with any individual plan change scenario for VSERS Group C. However, two plan changes with a group may not be additive.

Except for VSERS Group C plan changes (as noted above), we did not assume that any change would materially affect participant behavior and therefore did not revise any demographic assumptions as a result of these plan changes. If any changes affect participant behavior, the results would be different than those illustrated in this analysis. The plan changes were valued assuming that the changes could be fully implemented and that no portion of current accrued or projected benefits were protected. If any changes are implemented with such protections in place, or if required by law, the reductions in actuarial accrued liability and actuarially determined contribution will be lower than illustrated in this analysis.

## Disclosure

This analysis was prepared in accordance with generally accepted actuarial principles and practices at the request of the Pension Task Force. Please refer to our June 30, 2020, Actuarial Valuation and Review reports for both VSERS and VSTRS for the assumptions and plan of benefits underlying these calculations.

The measurements shown in these actuarial calculations may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

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.

The actuarial calculations were directed under my supervision. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in this report is complete and accurate. In my opinion, each assumption is reasonable (taking into account the experience of the plan and reasonable expectations) and such other assumptions, in combination, offer my best estimate of anticipated experience under the plan.

Please let me know if you have any questions or need any additional information.

Sincerely,

A handwritten signature in black ink that reads "Matthew A. Strom". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

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

cc: Kathleen Riley, Segal

## Results

### VSERS Group F – Scenario Descriptions

Revenue Scenario	One-Time Revenue	Recurring Revenue	Description of Member Contribution Changes
Rev-A	\$75M	\$15M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>3 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23.
Rev-B	50M	40M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>3 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23.
Rev-C	75M	15M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>5 years</b> beginning in FY23.
Rev-D	50M	40M	25 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>4 years</b> beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate by 0.5% per year for <b>5 years</b> beginning in FY23.

Plan Change Scenario	Description of Plan Changes
PC-1	Cost-of-Living-Adjustment (COLA) Threshold – Members only receive a COLA on the first \$24,000 of their annual pension income.
PC-2	Increasing COLA Threshold – Members only receive a COLA on the first \$24,000 of their annual pension income, but the \$24,000 threshold is indexed to increase annually by the Consumer-Price-Index (CPI) from FY24 onward.
PC-3	CPI thresholds are updated to reflect a 0% minimum and a 4% maximum.
PC-4	Members will not receive a COLA until they have been retired for at least 24 months.
PC-5	Members will not receive a COLA until they have been retired for at least 36 months.
PC-6	Increase the Max Benefit Cap by 1% of Average Final Compensation (AFC) for each year worked beyond 30 years (Old Group F) and 36 years (New Group F), applied prospectively to service actually worked after July 1, 2022.

## VSERS Group F - Additional State Revenue Amounts

Additional State Revenue Amounts (\$ in millions) <sup>1</sup>				
June 30	Rev-A	Rev-B	Rev-C	Rev-D
2022	\$75.0	\$50.0	\$75.0	\$50.0
2023	6.3	16.7	6.3	16.7
2024	15.0	40.0	15.0	40.0
2025	15.3	40.8	15.3	40.8
2026	15.6	41.6	15.6	41.6
2027	15.9	42.4	15.9	42.4
2028	16.2	43.3	16.2	43.3
2029	16.6	44.2	16.6	44.2
2030	16.9	45.0	16.9	45.0
2031	17.2	45.9	17.2	45.9
2032	17.6	46.9	17.6	46.9
2033	17.9	47.8	17.9	47.8
2034	18.3	48.8	18.3	48.8
2035	18.7	49.7	18.7	49.7
2036	19.0	50.7	19.0	50.7
2037	19.4	-	19.4	-
2038	19.8	-	19.8	-

<sup>1</sup> Once a System is projected to become 100% funded, we assumed that no additional State revenue amounts will be paid for all subsequent years.

## VSERS Group F - Revenue Scenarios Rev-A through Rev-D

2020 Valuation (\$ in millions)	Baseline	Rev-A	Rev-B	Rev-C	Rev-D
<b>Estimated Actuarially Determined Contribution for Fiscal 2023*:</b>	\$123.7	\$116.8	\$116.8	\$115.4	\$115.4
Change from Baseline Valuation:		(\$6.9)	(\$6.9)	(\$8.3)	(\$8.3)
<b>Present Value of Additional Member Contributions from Fiscal 2023 through Fiscal 2038:</b>	N/A	\$70.6	\$70.6	\$84.0	\$84.0
<b>Present Value of Decrease in Employer Contributions from Fiscal 2023 through Fiscal 2038:</b>	N/A	(\$247.8)	(\$408.1)	(\$260.8)	(\$421.1)

\*Estimated in the June 30, 2020 Actuarial Valuation and Review for VSERS

### Projected Amortization Payment for the Plan Year Ending June 30 (\$ in millions)

Year	Baseline	Rev-A	Rev-B	Rev-C	Rev-D
2022	\$84.8	\$84.8	\$84.8	\$84.8	\$84.8
2023	90.4	90.5	90.5	90.5	90.5
2024	94.8	88.3	90.5	88.3	90.5
2025	99.1	90.6	92.1	90.5	92.0
2026	103.4	93.0	92.1	92.9	91.9
2027	107.7	95.3	91.4	95.1	91.3
2028	112.0	97.3	90.3	97.2	90.1
2029	116.3	99.2	88.4	99.0	88.3
2030	120.8	100.8	85.9	100.7	85.8
2031	125.3	102.1	82.5	102.0	82.3
2032	129.9	103.1	77.9	102.9	77.8
2033	134.6	103.6	71.9	103.4	71.8
2034	139.4	103.4	63.9	103.2	63.8
2035	144.4	102.3	53.2	102.1	53.1
2036	149.6	99.7	38.2	99.5	38.0
2037	155.2	94.4	15.5	94.3	15.4
2038	161.2	83.3	-	83.2	-

## VSERS Group F - Individual Plan Change Scenarios PC-1 through PC-6

2020 Valuation (\$ in millions)	Baseline	PC-1	PC-2	PC-3	PC-4	PC-5	PC-6
<b>Actuarial Accrued Liability:</b>	\$3,095.3	\$2,995.8	\$3,025.3	\$3,081.4	\$3,072.1	\$3,053.3	\$3,135.4
Change from Baseline Valuation:		(\$99.5)	(\$70.0)	(\$13.9)	(\$23.2)	(\$42.0)	\$40.1
<b>Actuarial Value of Assets:</b>	\$2,054.8	\$2,054.8	\$2,054.8	\$2,054.8	\$2,054.8	\$2,054.8	\$2,054.8
<b>Unfunded Actuarial Accrued Liability:</b>	\$1,040.5	\$941.0	\$970.4	\$1,026.5	\$1,017.2	\$998.5	\$1,080.6
Change from Baseline Valuation:		(\$99.5)	(\$70.1)	(\$14.0)	(\$23.3)	(\$42.0)	\$40.1
<b>Funded Percentage:</b>	66.4%	68.6%	67.9%	66.7%	66.9%	67.3%	65.5%
Change from Baseline Valuation:		2.2%	1.5%	0.3%	0.5%	0.9%	-0.9%
<b>Normal Cost*:</b>	\$73.2	\$68.3	\$70.1	\$72.4	\$71.8	\$70.8	\$74.2
Change from Baseline Valuation:		(\$4.9)	(\$3.1)	(\$0.8)	(\$1.4)	(\$2.4)	\$1.0
<b>Estimated Actuarially Determined Contribution for Fiscal 2023**:</b>	\$123.7	\$109.6	\$114.1	\$121.6	\$120.2	\$117.4	\$128.4
Change from Baseline Valuation:		(\$14.1)	(\$9.6)	(\$2.1)	(\$3.5)	(\$6.3)	\$4.7

\*Adjusted for middle of the year timing

\*\*Estimated in the June 30, 2020 Actuarial Valuation and Review for VSERS

Note: Numbers may not add due to rounding

### Projected Amortization Payment for the Plan Year Ending June 30 (\$ in millions)

Year	Baseline	PC-1	PC-2	PC-3	PC-4	PC-5	PC-6
2022	\$84.8	\$84.8	\$84.8	\$84.8	\$84.8	\$84.8	\$84.8
2023	90.4	81.9	84.4	89.2	88.4	86.8	93.8
2024	94.8	84.8	87.8	93.4	92.4	90.6	98.7
2025	99.1	88.7	91.8	97.6	96.7	94.7	103.2
2026	103.4	92.7	95.9	101.9	100.9	98.9	107.6
2027	107.7	96.7	99.9	106.1	105.1	103.0	112.0
2028	112.0	100.6	104.0	110.4	109.3	107.2	116.4
2029	116.3	104.6	108.1	114.7	113.6	111.4	120.9
2030	120.8	108.7	112.3	119.1	117.9	115.7	125.5
2031	125.3	112.8	116.5	123.5	122.4	120.0	130.1
2032	129.9	117.0	120.8	128.1	126.9	124.5	134.8
2033	134.6	121.3	125.2	132.7	131.5	129.0	139.7
2034	139.4	125.8	129.8	137.5	136.2	133.7	144.6
2035	144.4	130.3	134.5	142.5	141.2	138.6	149.8
2036	149.6	135.1	139.3	147.6	146.3	143.6	155.2
2037	155.2	140.2	144.5	153.1	151.7	149.0	160.8
2038	161.2	145.8	150.2	159.1	157.7	154.9	167.0

## VSERS Group C – Scenario Descriptions

Revenue Scenario	One-Time Revenue	Recurring Revenue	Description of Member Contribution Changes
Rev-A	\$75M	\$15M	Increase member contribution rate by 0.45% per year for 3 years beginning in FY23.
Rev-B	50M	40M	Increase member contribution rate by 0.45% per year for 3 years beginning in FY23.
Rev-C	75M	15M	25 <sup>th</sup> -49 <sup>th</sup> salary percentile: Increase member contribution rate to 9.0% beginning in FY23. 50 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate to 10.0% beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate to 11.0% beginning in FY23.
Rev-D	50M	40M	25 <sup>th</sup> -49 <sup>th</sup> salary percentile: Increase member contribution rate to 9.0% beginning in FY23. 50 <sup>th</sup> -74 <sup>th</sup> salary percentile: Increase member contribution rate to 10.0% beginning in FY23. 75 <sup>th</sup> -100 <sup>th</sup> salary percentile: Increase member contribution rate to 11.0% beginning in FY23.

Plan Change Scenario	Description of Plan Changes
PC-1	Increase the Max Benefit Cap by <b>1% of AFC</b> for each year worked beyond reaching the later of age 50 or 20 years of benefit service, applied prospectively to service actually worked after July 1, 2022. Increase mandatory retirement age to 57.
PC-2	Increase the Max Benefit Cap by <b>2% of AFC</b> for each year worked beyond reaching the later of age 50 or 20 years of benefit service, applied prospectively to service actually worked after July 1, 2022. Increase mandatory retirement age to 57.

## VSERS Group C – Additional State Revenue Amounts

Additional State Revenue Amounts (\$ in millions) <sup>1</sup>				
June 30	Rev-A	Rev-B	Rev-C	Rev-D
2022	\$75.0	\$50.0	\$75.0	\$50.0
2023	6.3	16.7	6.3	16.7
2024	15.0	40.0	15.0	40.0
2025	15.3	40.8	15.3	40.8
2026	15.6	41.6	15.6	41.6
2027	15.9	42.4	15.9	42.4
2028	16.2	43.3	16.2	43.3
2029	16.6	44.2	16.6	44.2
2030	16.9	45.0	16.9	45.0
2031	17.2	45.9	17.2	45.9
2032	17.6	46.9	17.6	46.9
2033	17.9	47.8	17.9	47.8
2034	18.3	48.8	18.3	48.8
2035	18.7	49.7	18.7	49.7
2036	19.0	50.7	19.0	50.7
2037	19.4	-	19.4	-
2038	19.8	-	19.8	-

<sup>1</sup> Once a System is projected to become 100% funded, we assumed that no additional State revenue amounts will be paid for all subsequent years.

## VSERS Group C - Revenue Scenarios Rev-A through Rev-D

2020 Valuation (\$ in millions)	Baseline	Rev-A	Rev-B	Rev-C	Rev-D
<b>Estimated Actuarially Determined Contribution for Fiscal 2023*:</b>	\$123.7	\$123.4	\$123.4	\$123.2	\$123.2
Change from Baseline Valuation:		(\$0.3)	(\$0.3)	(\$0.5)	(\$0.5)
<b>Present Value of Additional Member Contributions from Fiscal 2023 through Fiscal 2038:</b>	N/A	\$2.5	\$2.5	\$4.3	\$4.3
<b>Present Value of Decrease in Employer Contributions from Fiscal 2023 through Fiscal 2038:</b>	N/A	(\$181.7)	(\$342.2)	(\$183.4)	(\$344.0)

\*Estimated in the June 30, 2020 Actuarial Valuation and Review for VSERS

### Projected Amortization Payment for the Plan Year Ending June 30 (\$ in millions)

Year	Baseline	Rev-A	Rev-B	Rev-C	Rev-D
2022	\$84.8	\$84.8	\$84.8	\$84.8	\$84.8
2023	90.4	90.4	90.4	90.4	90.4
2024	94.8	88.2	90.4	88.2	90.4
2025	99.1	91.2	92.7	91.1	92.6
2026	103.4	93.6	92.7	93.6	92.7
2027	107.7	95.9	92.1	95.9	92.1
2028	112.0	98.0	90.9	98.0	90.9
2029	116.3	99.9	89.1	99.9	89.1
2030	120.8	101.5	86.6	101.5	86.6
2031	125.3	102.8	83.2	102.8	83.1
2032	129.9	103.8	78.6	103.8	78.6
2033	134.6	104.3	72.6	104.3	72.6
2034	139.4	104.1	64.7	104.1	64.7
2035	144.4	103.0	54.0	103.0	53.9
2036	149.6	100.4	38.9	100.4	38.9
2037	155.2	95.2	16.3	95.1	16.3
2038	161.2	84.0	-	84.0	-

## VSERS Group C - Individual Plan Change Scenarios PC-1 and PC-2

2020 Valuation (\$ in millions)	Baseline	PC-1	PC-2
<b>Actuarial Accrued Liability:</b>	\$3,095.3	\$3,072.8	\$3,079.9
Change from Baseline Valuation:		(\$22.5)	(\$15.4)
<b>Actuarial Value of Assets:</b>	\$2,054.8	\$2,054.8	\$2,054.8
<b>Unfunded Actuarial Accrued Liability:</b>	\$1,040.5	\$1,018.0	\$1,025.1
Change from Baseline Valuation:		(\$22.5)	(\$15.4)
<b>Funded Percentage:</b>	66.4%	66.9%	66.7%
Change from Baseline Valuation:		0.5%	0.3%
<b>Normal Cost*:</b>	\$73.2	\$72.0	\$72.4
Change from Baseline Valuation:		(\$1.2)	(\$0.8)
<b>Estimated Actuarially Determined Contribution for Fiscal 2023**:</b>	\$123.7	\$120.4	\$121.4
Change from Baseline Valuation:		(\$3.3)	(\$2.3)

\*Adjusted for middle of the year timing

\*\*Estimated in the June 30, 2020 Actuarial Valuation and Review for VSERS

Note: Numbers may not add due to rounding

### Projected Amortization Payment for the Plan Year Ending June 30 (\$ in millions)

Year	Baseline	PC-1	PC-2
2022	\$84.8	\$84.8	\$84.8
2023	90.4	88.5	89.1
2024	94.8	92.6	93.3
2025	99.1	96.8	97.5
2026	103.4	101.0	101.8
2027	107.7	105.3	106.0
2028	112.0	109.5	110.3
2029	116.3	113.8	114.6
2030	120.8	118.1	119.0
2031	125.3	122.6	123.4
2032	129.9	127.1	128.0
2033	134.6	131.7	132.6
2034	139.4	136.5	137.4
2035	144.4	141.4	142.4
2036	149.6	146.5	147.5
2037	155.2	151.9	152.9
2038	161.2	157.9	158.9

## VSTRS – Scenario Descriptions

Revenue Scenario	One-Time Revenue	Recurring Revenue	Description of Member Contribution Changes
Rev-A	\$97.5M	\$32.5M	Members currently paying <b>5%</b> : Increase member contribution rate by 0.25% per year for <b>4 years</b> beginning in <b>FY23</b> . Members currently paying <b>6%</b> : Increase member contribution rate by 0.25% per year for <b>2 years</b> beginning in <b>FY25</b> .
Rev-B	97.5M	50M	Replace current “flat” member contribution rates with “progressive” contribution rates beginning in FY23 as follows: -5.50% on the first \$40,000 of income. -6.25% on income between \$40,000 and \$60,000. -7.00% on income between \$60,000 and \$80,000. -7.75% on income above \$80,000.
Plan Change Scenario	Description of Plan Changes		
PC-1	COLA Threshold - 50% of CPI on the first \$48,000 of annual pension income, 25% of CPI on annual pension income in excess of \$48,000.		
PC-2	Tiered COLA - 100% of CPI on the first \$20,000 of annual pension income, 50% of CPI on annual pension income between \$20,000-\$40,000, 25% of CPI on annual pension income above \$40,000.		
PC-3	Vested COLA - No COLA upon retirement unless a member has at least 15 years of benefit service.		
PC-4	Increase the Max Benefit Cap by 1% of AFC for each year worked beyond 33.34 years (Group C2 only), applied prospectively to service actually worked after July 1, 2022.		

## VSTRS – Additional State Revenue Amounts

<b>Additional State Revenue Amounts (\$ in millions)<sup>1</sup></b>		
<b>June 30</b>	<b>Rev-A</b>	<b>Rev-B</b>
<b>2022</b>	\$97.5	\$97.5
<b>2023</b>	13.5	20.8
<b>2024</b>	32.5	50.0
<b>2025</b>	33.2	51.0
<b>2026</b>	33.8	52.0
<b>2027</b>	34.5	53.1
<b>2028</b>	35.2	54.1
<b>2029</b>	35.9	55.2
<b>2030</b>	36.6	56.3
<b>2031</b>	37.3	57.4
<b>2032</b>	38.1	58.6
<b>2033</b>	38.8	59.8
<b>2034</b>	39.6	60.9
<b>2035</b>	40.4	62.2
<b>2036</b>	41.2	63.4
<b>2037</b>	42.0	64.7
<b>2038</b>	42.9	66.0

<sup>1</sup> Once a System is projected to become 100% funded, we assumed that no additional State revenue amounts will be paid for all subsequent years.

## VSTRS - Revenue Scenarios Rev-A and Rev-B

2020 Valuation (\$ in millions)	Baseline	Rev-A	Rev-B
<b>Estimated Actuarially Determined Contribution for Fiscal 2023*:</b>	\$202.1	\$199.2	\$197.6
Change from Baseline Valuation:		(\$2.9)	(\$4.5)
<b>Present Value of Additional Member Contributions from Fiscal 2023 through Fiscal 2038:</b>	N/A	\$24.6	\$46.0
<b>Present Value of Decrease in Employer Contributions from Fiscal 2023 through Fiscal 2038:</b>	N/A	(\$355.5)	(\$509.4)

\*Estimated in the June 30, 2020 Actuarial Valuation and Review for VSTRS

### Projected Amortization Payment for the Plan Year Ending June 30 (\$ in millions)

Year	Baseline	Rev-A	Rev-B
2022	\$157.3	\$157.3	\$157.3
2023	166.2	166.2	166.2
2024	172.9	164.4	164.4
2025	179.4	168.4	167.5
2026	186.0	171.3	168.7
2027	192.7	173.8	169.1
2028	199.4	176.0	168.9
2029	206.4	177.7	168.0
2030	213.4	178.9	166.2
2031	220.6	179.5	163.4
2032	228.0	179.3	159.2
2033	235.6	178.0	153.3
2034	243.5	175.2	145.0
2035	251.5	170.3	133.2
2036	259.9	162.0	116.1
2037	268.7	147.7	89.5
2038	278.1	120.1	42.2

## VSTRS - Individual Plan Change Scenarios PC-1 through PC-4

2020 Valuation (\$ in millions)	Baseline	PC-1	PC-2	PC-3	PC-4
<b>Actuarial Accrued Liability:</b>	\$3,969.0	\$3,954.9	\$4,003.7	\$3,965.6	\$3,999.0
Change from Baseline Valuation:		(\$14.1)	\$34.7	(\$3.4)	\$30.0
<b>Actuarial Value of Assets:</b>	<u>\$2,035.7</u>	<u>\$2,035.7</u>	<u>\$2,035.7</u>	<u>\$2,035.7</u>	<u>\$2,035.7</u>
<b>Unfunded Actuarial Accrued Liability:</b>	\$1,933.3	\$1,919.2	\$1,968.0	\$1,929.9	\$1,963.3
Change from Baseline Valuation:		(\$14.1)	\$34.7	(\$3.4)	\$30.0
<b>Funded Percentage:</b>	51.3%	51.5%	50.8%	51.3%	50.9%
Change from Baseline Valuation:		0.2%	-0.5%	0.0%	-0.4%
<b>Normal Cost*:</b>	\$74.6	\$73.8	\$76.6	\$73.9	\$75.7
Change from Baseline Valuation:		(\$0.8)	\$2.0	(\$0.7)	\$1.1
<b>Estimated Actuarially Determined Contribution for Fiscal 2023**:</b>	\$202.1	\$200.0	\$207.3	\$201.0	\$206.0
Change from Baseline Valuation:		(\$2.1)	\$5.2	(\$1.1)	\$3.9

\*Adjusted for middle of the year timing

\*\*Estimated in the June 30, 2020 Actuarial Valuation and Review for VSTRS

Note: Numbers may not add due to rounding

Projected Amortization Payment for the Plan Year Ending June 30 (\$ in millions)					
Year	Baseline	PC-1	PC-2	PC-3	PC-4
2022	\$157.3	\$157.3	\$157.3	\$157.3	\$157.3
2023	166.2	165.0	169.1	165.9	168.7
2024	172.9	171.4	176.3	172.5	175.8
2025	179.4	177.9	183.0	179.0	182.5
2026	186.0	184.5	189.7	185.6	189.1
2027	192.7	191.1	196.4	192.2	195.9
2028	199.4	197.8	203.3	199.0	202.8
2029	206.4	204.7	210.4	205.9	209.8
2030	213.4	211.7	217.5	213.0	217.0
2031	220.6	218.9	224.8	220.2	224.3
2032	228.0	226.2	232.4	227.5	231.8
2033	235.6	233.7	240.1	235.1	239.5
2034	243.5	241.5	248.0	242.9	247.5
2035	251.5	249.5	256.2	251.0	255.7
2036	259.9	257.8	264.7	259.4	264.2
2037	268.7	266.5	273.5	268.1	273.1
2038	278.1	275.8	283.0	277.5	282.6