



**Cavanaugh Macdonald**  
CONSULTING, LLC

*The experience and dedication you deserve*



Virginia  
Retirement  
System

**Report on the Actuarial Valuation for  
Virginia Retirement System**

**Prepared as of June 30, 2021**





# Cavanaugh Macdonald

CONSULTING, LLC

*The experience and dedication you deserve*

January 18, 2022

The Board of Trustees  
Virginia Retirement System  
1200 E. Main Street  
Richmond, VA 23219

Dear Trustees:

We are pleased to submit the results of the annual actuarial valuation for the following divisions of the Virginia Retirement System (VRS), prepared as of June 30, 2021.

- State Employees
- Teachers
- State Police (SPORS)
- Judicial
- Virginia Law Officers (VaLORS)

In addition, this report includes information in aggregate on the actuarial valuations of the Political Subdivisions participating in VRS as of June 30, 2021. We have prepared, and provided separately, actuarial valuation reports for each of the Political Subdivisions. Please refer to the individual reports for the valuation results, summary of actuarial assumptions and methods, and plan provisions for each of the Political Subdivision plans.

The purpose of this report is to provide a summary of the funded status of VRS as of June 30, 2021 and to recommend rates of contribution. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The funded status of the plan is the ratio of the assets to the actuarial accrued liability. While the market value of assets gives an indication of the funded status of a plan at a particular point in time and is used for financial reporting, it is not used directly in the calculation of the employer contribution rates. A less volatile actuarial value of assets, which smooths the effect of market fluctuations over a five-year period, is applied to determine the funded status for rate setting purposes. For informational purposes, we exhibit the funded status based on this smoothed actuarial value of assets basis as well as the market value in this report. While the current funded status can be used to show the current fiscal health of the plan as of the valuation date, it is not the only indicator of future contributions to the plan. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

The calculations in this report have been made on a basis consistent with our understanding of VRS's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes. For example, actuarial computations for purposes of fulfilling financial accounting requirements under Governmental Accounting Standards No. 67 and No. 68 are provided in separate reports.



The valuation results indicate that the full employer contribution rates shown in the table below are sufficient to fund the normal cost for all members and finance the unfunded accrued liability of the plans. For comparison, in the table below we present the employer contribution rates for fiscal years ending 2021 and 2022 based on the June 30, 2019 actuarial valuation. Contribution rates for VRS employers are established every two years. The actuarially calculated employer contribution rates based on the June 30, 2020 valuation presented in this report are for informational purposes only. The total employer rates include the average employer rate for the defined contribution component of the Hybrid Plan.

System	Fiscal Years 2021/2022	Informational Only	Fiscal Years 2023/2024			
			Before Assumption Changes	After Assumption Changes		
	Board & General Assembly Approved	Total Employer Rate for Retirement Plans	Total Employer Rate for Retirement Plans	Actuarially Determined Employer Rate for Defined Benefit Plan	Employer Rate for Hybrid DC Component	Total Employer Rate for Retirement Plans
	2019 Valuation	2020 Valuation	2021 Valuation			
State	14.46%	14.57%	13.24%	13.07%	1.06%	14.13%
Teachers	16.62%	16.65%	14.42%	13.95%	0.81%	14.76%
SPORS	26.33%	26.72%	25.82%	29.98%	N/A	29.98%
VaLORS	21.90%	22.13%	21.99%	24.60%	N/A	24.60%
Judicial	29.84%	29.24%	25.25%	28.81%	1.86%	30.67%
Political Subdivisions (Average rates)	8.33%	8.42%	7.23%	7.97%	0.82%	8.79%

Subsequent to the 2019 rate-setting valuations, legislation was passed during the 2020 General Assembly session that modified the funding provided for the SPORS and VaLORS plans. The budget amendment provided additional funding pursuant to the passage of House Bill 1495 and Senate Bill 54. These bills allow retired law-enforcement personnel to return to work as school security officers while continuing to receive their retirement allowance. The increased funding covers estimated costs related to incentivizing members to retire earlier than originally expected, thus impacting retirement patterns and increasing plan liabilities. The rate funded in the 2021/2022 budget for SPORS was 26.33%, up from the 26.26% certified by the VRS Board. Similarly, the VaLORS rate funded in the 2021/2022 budget was 21.90%, up from 21.88% certified by the VRS Board.

The promised benefits of VRS are included in the calculated contribution rates which are developed using the entry age normal cost method. The valuation takes into account the differentiation between Plan 1 vested members, Plan 1 non-vested members as of January 1, 2013 resulting from HB 1130 and SB 498, Plan 2 members, and the Hybrid Plan. Five-year smoothed market value of assets is used for actuarial valuation purposes. Gains and losses are reflected in the unfunded accrued liability. In accordance with the supplemental contribution provision under the 2011 Appropriation Act, Item 469(1)(6), the portion of the unfunded accrued liability with respect to deferred contributions for the 2010-2012 biennium is amortized using a level-dollar, closed, 10-year period beginning June 30, 2011. Amendments to the 2016-2017 Virginia budget accelerated the payback of the full outstanding balance of the deferred contributions to all plans except Teachers. As of June 30, 2021, the Teachers balance has been paid in full. In accordance with the funding policy adopted by the Board of Trustees in 2013, the balance of the unfunded accrued liability as of June 30, 2013 is being amortized by regular annual contributions as a level percentage of payroll over a closed 22-year period and changes in the unfunded accrued liability since June 30, 2013 are amortized over layered 20-year closed



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periods. The amortization of the unfunded accrued liability assumes that payroll will increase by 3% annually and the amortization period will decrease by one year until reaching 0 years.

We have prepared several supporting schedules shown in the actuarial section of the Annual Comprehensive Financial Report, including the Schedule of Active Member Data and the Analysis of Financial Experience. In addition, we prepared the underlying schedules from which the selected information in the annual report was extracted. For completeness, the table of Changes in Unfunded Actuarial Accrued Liabilities in Section V and the Retiree and Beneficiary Data in Schedule I include the information with respect to the Political Subdivisions participating in VRS.

Our organization has only a contractual relationship with the Virginia Retirement System to provide actuarial consulting services and we do not provide other services to nor have a financial interest in the Virginia Retirement System. There are no known interests or relationships that our firm has with the Virginia Retirement System that may impair or appear to impair the objectivity of our work.

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the valuation was prepared for funding purposes with assumptions and methods that meet the parameters of the Actuarial Standards of Practice, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

Future actuarial results may differ significantly from the current results 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 or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

In order to prepare the results in this report we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments that we believe would be appropriate.



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The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Respectfully submitted,

A handwritten signature in blue ink, consisting of stylized, overlapping letters 'L' and 'L'.

Larry Langer, ASA, FCA, EA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink, written in a cursive style as 'Micki R. Taylor'.

Micki R. Taylor, ASA, EA, FCA, MAAA  
Consulting Actuary

A handwritten signature in blue ink, written in a cursive style as 'Alisa Bennett'.

Alisa Bennett, FSA, EA, FCA, MAAA  
President



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## Section I – Summary of Principal Results

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### **Introduction and Summary**

This report contains the actuarial valuation results as of June 30, 2021 for the five statewide systems within the Virginia Retirement System (VRS) - State Employees, Teachers, State Police, Judicial and Virginia Law Officers - as determined by Cavanaugh Macdonald Consulting, the actuary for the VRS. Questions about this report should be directed to the VRS rather than to Cavanaugh Macdonald Consulting.

### **Employer Contribution Rates**

The previous employer contribution rates were set by the June 30, 2019 valuation and are effective for the period July 1, 2020 through June 30, 2022, or fiscal years ending 2021 and 2022. The June 30, 2020 calculated rates shown in each table below are for informational purposes. Rates for subsequent fiscal years will be determined by future actuarial valuations.

The recommended employer contribution rate consists of five pieces which are shown in the summary tables for each statewide system:

- **Employer Normal Cost Rate** - The ongoing annual cost of active employees accruing benefits under the plan. This rate is net of the member contribution rate. The normal cost is developed using the entry age normal cost method, which develops normal costs for active members which stay level during their career if benefit provisions are unchanged and assumptions are realized.
- **Administrative Expense** - An estimate of the administrative expenses to be paid out of the trust in the upcoming fiscal year.
- **Amortization of Deferred Contributions** - The amortization, if any, of the unfunded accrued liability associated with the deferred contributions for the 2010-2012 biennium.
- **Amortization of Balance of UAAL** - The amortization of, or payment towards, the unfunded actuarial accrued liability (UAAL) for the year. The UAAL is the amount by which the actuarial value of assets falls short of, or exceeds, the actuarial accrued liability for the plan. Under the funding arrangement adopted by the Board, the UAAL is being amortized as individual layered bases. The legacy unfunded actuarial accrued liability, the unfunded actuarial accrued liability as of June 30, 2013, is amortized over a closed 30-year period beginning June 30, 2013. The amortization period of the legacy unfunded will decrease by one in each subsequent valuation until reaching 0 years. The actuarial gains and losses and other changes in the unfunded due to benefit and actuarial assumption and method changes for each valuation subsequent to the June 30, 2013 valuation will be amortized over a closed 20-year period. The amortization of the unfunded accrued liability assumes that payroll will increase by 3% annually and the amortization period will decrease by one year until reaching 0 years.
- **DC Contribution for Hybrid Members** - 1% mandatory employer contribution as well as an estimate of the employer match to the voluntary contributions made to the DC plan by Hybrid Plan members.



## *Section I – Summary of Principal Results*

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### **Assets**

The following summary tables show the market and actuarial values of assets for each system. Five-year smoothed market value of assets is used for actuarial valuation purposes. The actuarial value reflects only a portion of the excess (or shortfall) between recent market value returns and the corresponding expected returns based on the 6.75% investment return assumption. The actuarial value recognizes this excess return (or shortfall) over a five-year period at the rate of 20% per year. This approach dampens year-to-year fluctuations in the contribution rates. The actuarial value of assets cannot be less than 80% or more than 120% of the market value of assets. Schedule B shows the development of the actuarial value of assets for each system and Schedule C shows the summary of changes in the market value of assets from the previous year.

### **Actuarial Assumptions and Methods**

Schedules E and F of this report outline the full set of actuarial assumptions and methods used in the current valuation. Effective with the June 30, 2021 valuation, the actuarial assumptions were revised to reflect the results of the experience study for the period 2016 – 2020. The next experience review is expected to be implemented with the June 30, 2025 annual valuation. The valuation assumes an annual cost-of-living adjustment of 2.50% for Plan 1 members and 2.25% for Plan 2 and Hybrid members. Salary increases range between 3.50% and 5.35% depending on the member's service and classification (i.e., members with general employee benefits or with enhanced hazardous duty coverage). Liabilities were determined under the Entry Age Normal actuarial cost method.





## Section I – Summary of Principal Results

The valuation reflects changes in the actuarial assumptions recommended in the experience study of VRS for the four-year period ending June 30, 2020 and adopted by the Board at its April 20, 2021 meeting. The table below summarizes the changes in actuarial assumptions. In addition to these assumption changes, decrement timing was changed from beginning of the year to mid-year for all plans except Teachers.

System	Assumption	Description
State	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
Teachers	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
SPORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Increased rates for ages 55 to 61, 63, and 64 with 26 or more years of service; changed final retirement age from 65 to 70
	3. Withdrawal Rates	Decreased rate for 0 years of service and increased rates for 1 to 6 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
VaLORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Increased rates at some younger ages, decreased at age 62, and changed final retirement age from 65 to 70
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
JRS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Review separately from State employees because exhibit fewer deaths. Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Decreased rates for ages 60-66 and 70-72
	3. Withdrawal Rates	No change
	4. Disability Rates	No change
	5. Salary Increases	Reduce increases across all ages by 0.50%



## *Section I – Summary of Principal Results*

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### **Benefit Provisions**

This actuarial valuation takes into account the provisions of VRS as of the valuation date of June 30, 2021. There have been no significant changes in plan provisions since the prior valuation. Some of the Political Subdivision plans have made changes to the benefits provided to members in hazardous duty positions. In aggregate the impact of these changes on the Political Subdivision plans is not significant. The main benefit provisions are summarized in Schedule G of this report. Please refer to the individual reports for the benefit provisions of each of the Political Subdivision plans.

### **Member Data**

This actuarial valuation is based on census data supplied by the VRS. The number of active and inactive members is shown in the summary tables with additional information provided in Section II as well as Schedules H and I. The liability for each system's share of the benefits for former employees has been reflected in the liabilities and in the contribution rates. The number of retirees shown includes those who retired from that system, as well as those who retired from another system or employer with service attributed to that system. The liabilities also take into account each system's share of the benefits for former active members who later were employed by another VRS system, and subsequently retired.



## *Section I – Summary of Principal Results*

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### **Experience**

State Police, Virginia Law Officers, and Judicial experienced an actuarial loss for the year ended June 30, 2021 while State Employees and Teachers experienced actuarial gains. An actuarial loss means the unfunded actuarial accrued liability was larger than anticipated; whereas an actuarial gain means the unfunded actuarial liability was less than anticipated. All the plans had gains due to greater than expected investment return and lower-than-expected Cost of Living Allowances (COLAs) and losses from assumption changes, primarily mortality. Additional factors for each system are as follows with more details found in Section V:

- State Employees had additional gains due to post-retirement mortality and additional losses due to pay increases greater than expected.
- Teachers had additional gains due to pay increases lower than expected; additionally, the Teachers plan received an extra contribution of \$61.3 million in June 2021.
- State Police had additional losses due to pay increases greater than expected—State Police employees received 8% pay increases along with eligible members receiving further compression pay increases.
- Judicial had additional gains due to retirement.
- Virginia Law Officers had additional losses due to pay increases greater than expected and more retirements than expected.

### **Summary of Results**

For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results for State Employees, Teachers, State Police, Judicial and Virginia Law Officers are summarized on the following pages. In addition to the summary tables for each statewide system, we present a summary of the valuation results for the political subdivisions in aggregate.



Section I – Summary of Principal Results

**STATE EMPLOYEES  
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2021	June 30, 2020
Members:		
Active	73,686	75,069
Long Term Disability	2,005	2,056
Retirees and Beneficiaries	70,231	68,844
Inactive, Vested	14,555	14,040
Inactive, Non-Vested	32,979	31,150
Inactive, active elsewhere in VRS	<u>9,086</u>	<u>9,276</u>
Total	202,542	200,435
Annual Covered Payroll	\$ 4,594,347	\$ 4,428,496
Annual Retirement Benefits	\$ 1,472,727	\$ 1,425,109
Total Assets:		
Actuarial Value	\$ 20,615,301	\$ 19,333,674
Market Value	23,112,417	18,770,068
Actuarial Accrued Liability	\$ 26,727,971	\$ 25,751,335
Funded Ratio:		
Actuarial Value of Assets	77.13%	75.08%
Market Value of Assets	86.47%	72.89%
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>6,112,670</u>	<u>6,417,661</u>
Total UAAL	\$ 6,112,670	\$ 6,417,661
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>2023 &amp; 2024</b>	<b>For Informational Purposes</b>
Employer Contribution Rate Defined Benefit Plan:		
Employer Normal Cost Rate	4.76 %	4.69 %
Administrative Expense	0.29 %	0.29 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>8.02 %</u>	<u>8.60 %</u>
Annual Recommended Contribution	13.07 %	13.58 %
DC Contribution for Hybrid Members	<u>1.06 %</u>	<u>0.99 %</u>
Total Employer Contribution Rate Retirement Plans	14.13 %	14.57 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	13-22	14-23



Section I – Summary of Principal Results

**TEACHERS**  
**(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2021	June 30, 2020
Members:		
Active	149,793	150,681
Long Term Disability	15	9
Retirees and Beneficiaries	106,011	102,719
Inactive, Vested	28,677	27,293
Inactive, Non-Vested	41,266	39,533
Inactive, active elsewhere in VRS	<u>5,974</u>	<u>6,042</u>
Total	331,736	326,277
Annual Covered Payroll*	\$ 8,971,605	\$ 8,911,307
Annual Retirement Benefits	\$ 2,562,291	\$ 2,465,245
Total Assets:		
Actuarial Value	\$ 40,725,782	\$ 37,556,121
Market Value	45,617,878	36,449,229
Actuarial Accrued Liability	\$ 52,747,596	\$ 50,834,783
Funded Ratio:		
Actuarial Value of Assets	77.21%	73.88%
Market Value of Assets	86.48%	71.70%
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 61,344
Balance of UAAL	<u>12,021,814</u>	<u>13,217,318</u>
Total UAAL	\$ 12,021,814	\$ 13,278,662
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>2023 &amp; 2024</b>	<b>For Informational Purposes</b>
Employer Contribution Rate Defined Benefit Plan:		
Employer Normal Cost Rate	5.63 %	6.11 %
Administrative Expense	0.28 %	0.27 %
Amortization of Deferred Contributions	0.00 %	0.70 %
Amortization of Balance of UAAL	<u>8.04 %</u>	<u>8.82 %</u>
Annual Recommended Contribution	13.95 %	15.90 %
DC Contribution for Hybrid Members	<u>0.81 %</u>	<u>0.75 %</u>
Total Employer Contribution Rate Retirement Plans	14.76 %	16.65 %
Amortization Period (Years):		
Deferred Contributions	0	1
Balance of UAAL	13-22	14-23

\* Includes an assumed pay increase on the valuation date.



Section I – Summary of Principal Results

**STATE POLICE  
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2021	June 30, 2020
Members:		
Active	1,947	1,924
Long-Term Disability	25	22
Retirees and Beneficiaries	1,755	1,668
Inactive, Vested	184	176
Inactive, Non-Vested	264	243
Inactive, active elsewhere in VRS	<u>229</u>	<u>227</u>
Total	4,404	4,260
Annual Covered Payroll	\$ 142,795	\$ 131,255
Annual Retirement Benefits	\$ 68,652	\$ 63,771
Total Assets:		
Actuarial Value	\$ 937,332	\$ 880,834
Market Value	1,050,148	854,762
Actuarial Accrued Liability	\$ 1,326,646	\$ 1,206,424
Funded Ratio:		
Actuarial Value of Assets	70.65%	73.01%
Market Value of Assets	79.16%	70.85%
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>389,314</u>	<u>325,590</u>
Total UAAL	\$ 389,314	\$ 325,590
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>2023 &amp; 2024</b>	<b>For Informational Purposes</b>
Employer Contribution Rate:		
Employer Normal Cost Rate	13.05 %	12.14 %
Administrative Expense	0.38 %	0.28 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>16.55 %</u>	<u>14.30 %</u>
Annual Recommended Contribution	29.98 %	26.72 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	13-22	14-23



Section I – Summary of Principal Results

**JUDICIAL  
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2021	June 30, 2020
Members:		
Active	453	449
Retirees and Beneficiaries	577	570
Inactive, Vested	6	7
Inactive, Non-Vested	0	0
Inactive, active elsewhere in VRS	<u>5</u>	<u>3</u>
Total	1,041	1,029
Annual Covered Payroll	\$ 79,125	\$ 74,734
Annual Retirement Benefits	\$ 46,397	\$ 45,412
Total Assets:		
Actuarial Value	\$ 600,670	\$ 566,239
Market Value	673,152	549,455
Actuarial Accrued Liability	\$ 733,408	\$ 677,872
Funded Ratio:		
Actuarial Value of Assets	81.90%	83.53%
Market Value of Assets	91.78%	81.06%
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>132,738</u>	<u>111,633</u>
Total UAAL	\$ 132,738	\$ 111,633
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>2023 &amp; 2024</b>	<b>For Informational Purposes</b>
Employer Contribution Rate:		
Employer Normal Cost Rate	20.23 %	20.49 %
Administrative Expense	0.44 %	0.32 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>8.14 %</u>	<u>6.66 %</u>
Annual Recommended Contribution	28.81 %	27.47 %
DC Contribution for Hybrid Members	<u>1.86 %</u>	<u>1.77 %</u>
Total Employer Contribution Rate Retirement Plans	30.67 %	29.24 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	13-22	14-23



Section I – Summary of Principal Results

**VIRGINIA LAW OFFICERS  
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2021	June 30, 2020
Members:		
Active	7,823	8,554
Long Term Disability	499	504
Retirees and Beneficiaries	6,234	5,883
Inactive, Vested	1,340	1,265
Inactive, Non-Vested	6,460	5,931
Inactive, active elsewhere in VRS	<u>3,493</u>	<u>3,347</u>
Total	25,849	25,484
Annual Covered Payroll	\$ 351,086	\$ 363,896
Annual Retirement Benefits	\$ 124,807	\$ 116,615
Total Assets:		
Actuarial Value	\$ 1,668,802	\$ 1,546,528
Market Value	1,868,924	1,500,469
Actuarial Accrued Liability	\$ 2,407,153	\$ 2,258,553
Funded Ratio:		
Actuarial Value of Assets	69.33%	68.47%
Market Value of Assets	77.64%	66.43%
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>738,351</u>	<u>712,025</u>
Total UAAL	\$ 738,351	\$ 712,025
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>2023 &amp; 2024</b>	<b>For Informational Purposes</b>
Employer Contribution Rate:		
Employer Normal Cost Rate	11.11 %	10.02 %
Administrative Expense	0.27 %	0.17 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>13.22 %</u>	<u>11.94 %</u>
Annual Recommended Contribution	24.60 %	22.13 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	13-22	14-23





Section I – Summary of Principal Results

**POLITICAL SUBDIVISIONS  
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2021	June 30, 2020
Number of Political Subdivisions in VRS (with active members)	597	596
Number of Political Subdivisions in VRS (no active members)	<u>12</u>	<u>11</u>
Total Political Subdivisions in VRS with members	609	607
Members:		
Active	108,613	110,854
Long Term Disability	55	35
Retirees and Beneficiaries*	80,790	77,384
Inactive, Vested*	20,372	19,381
Inactive, Non-Vested*	46,323	42,988
Inactive, active elsewhere in VRS	<u>35,088</u>	<u>34,450</u>
Total	291,241	285,092
Annual Covered Payroll	\$ 5,494,729	\$ 5,409,540
Annual Retirement Benefits	\$ 1,229,724	\$ 1,155,849
Total Assets:**		
Actuarial Value	\$ 23,686,882	\$ 21,869,927
Market Value	26,558,350	21,234,091
Actuarial Accrued Liability**	\$ 27,167,815	\$ 25,307,138
Funded Ratio:		
Actuarial Value of Assets	87.19%	86.42%
Market Value of Assets	97.76%	83.91%
Unfunded Actuarial Accrued Liability (UAAL)**	3,480,933	3,437,211
	<b>For Informational Purposes</b>	<b>For Informational Purposes</b>
Average Employer Contribution Rate Defined Benefit Plan (net of employee contributions)	7.97 %	7.63 %
Average Employer Contribution Rate Defined Contribution Plan	<u>0.82 %</u>	<u>0.79 %</u>
Average Employer Contribution Rate Retirement Plans	8.79 %	8.42 %
Amortization Period (Years)	13-22	14-23

\* Includes count for each plan from which members are receiving pension benefits or entitled to deferred vested benefits. Therefore, members with benefits from more than one political subdivision are counted more than once. This includes counts for Political Subdivisions with no active members.

\*\* Includes Political Subdivisions with no active members.



Section I – Summary of Principal Results

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In accordance with the supplemental contribution provision of the 2011 Appropriation Act, Item 469(1)(6), the portion of the unfunded accrued liability with respect to deferred contributions for the 2010-2012 biennium will be paid back to the plans over a 10-year period. Amendments to the 2016-2017 Virginia budget accelerated the payback of the full outstanding balance of the deferred contributions to all plans except Teachers. As of June 30, 2021, the Teachers balance has been paid in full. Below we provide an estimate of the deferred contributions as provided by VRS.

DIVISION	Deferred Contributions (\$ in thousands)	
	Outstanding Balance as of 6/30/2021	Outstanding Balance as of 6/30/2020
State Employees	\$ 0	\$ 0
Teachers	0	61,344
State Police	0	0
Virginia Law Officers	0	0
Judicial	<u>0</u>	<u>0</u>
Total	\$ 0	\$ 61,344



**Section II – Membership Data**

- Data regarding the membership of VRS for use as a basis of the valuation was furnished by VRS. The following table shows the number of active members and their annual compensation as of June 30, 2021 on the basis of which the valuation was prepared.

**TABLE 1**  
**THE NUMBER AND ANNUAL COMPENSATION OF**  
**ACTIVE MEMBERS AS OF JUNE 30, 2021**  
**(\$ IN THOUSANDS)**

DIVISION	NUMBER	COMPENSATION*
State Employees	73,686	\$4,594,347
Teachers	149,793	8,556,997
State Police	1,947	142,795
Judicial	453	79,125
Virginia Law Officers	7,823	351,086
Political Subdivisions	<u>108,613</u>	<u>5,494,729</u>
Total	342,315	\$19,219,079

\* Actual annual compensation provided by VRS.

- The following table shows a five-year history of active member valuation data, including the political subdivisions.

**TABLE 2**  
**SCHEDULE OF TOTAL ACTIVE MEMBER VALUATION DATA**

VALUATION DATE	NUMBER	ANNUAL PAYROLL (\$ IN THOUSANDS)	ANNUAL AVERAGE PAY	% CHANGE IN AVERAGE PAY
6/30/2021	342,315	\$ 19,219,079	\$ 56,144	3.20 %
6/30/2020	347,531	18,906,440	54,402	2.08 %
6/30/2019	345,678	18,422,511	53,294	3.78 %
6/30/2018	345,877	17,762,411	51,355	2.10 %
6/30/2017	343,559	17,280,580	50,299	1.95 %



Section II – Membership Data

- 3. The following table shows the number and annual retirement benefits payable to retired members and survivors on the roll of VRS as of the valuation date.

**TABLE 3**  
**THE NUMBER AND ANNUAL RETIREMENT BENEFITS**  
**OF RETIRED MEMBERS AND SURVIVORS OF DECEASED MEMBERS**  
**ON THE ROLL AS OF JUNE 30, 2021**  
**(\$ IN THOUSANDS)**

TYPE OF RETIREMENT	DIVISION						
	STATE EMPLOYEES	TEACHERS	STATE POLICE	JUDICIAL	VIRGINIA LAW OFFICERS	POLITICAL SUBDIVISIONS*	TOTAL
Service:							
Number	61,649	98,108	1,309	442	5,606	67,453	234,567
Annual	\$1,338,688	\$2,409,573	\$56,514	\$39,632	\$117,534	\$1,043,192	\$5,005,133
Average Age	72.84	72.55	68.55	76.11	65.48	70.30	71.79
Disability:							
Number	3,149	4,285	188	0	254	8,072	15,948
Annual	\$54,688	\$97,975	\$6,918	\$0	\$3,909	\$133,175	\$296,665
Average Age	71.07	68.30	67.07	N/A	60.11	65.54	67.31
Survivors:							
Number	5,433	3,618	258	135	374	5,265	15,083
Annual	\$79,351	\$54,743	\$5,220	\$6,765	\$3,364	\$53,357	\$202,800
Average Age	75.03	71.45	71.84	78.25	64.03	69.98	72.11
Total:							
Number	70,231	106,011	1,755	577	6,234	80,790	265,598
Annual	\$1,472,727	\$2,562,291	\$68,652	\$46,397	\$124,807	\$1,229,724	\$5,504,598
Benefits							
Average Age	72.93	72.34	68.88	76.61	65.18	69.81	71.54

\* Includes count for each plan from which members are receiving pension benefits. Therefore, members with benefits from more than one political subdivision are counted more than once. This includes counts for Political Subdivisions with no active members.



**Section II – Membership Data**

4. The following table shows a summary of the data for members with deferred benefits assumed payable at their normal retirement dates (dollar amounts are not rounded).

**TABLE 4  
SUMMARY OF MEMBERS WITH DEFERRED BENEFITS  
AS OF JUNE 30, 2021**

DIVISION	NUMBER	AVERAGE AGE	AVERAGE SERVICE	AVERAGE ANNUAL ESTIMATED BENEFIT
State Employees:				
Inactive, Vested	14,555	51.35	8.45	\$7,243
Long Term Disability	2,005	57.08	16.93	\$24,280
Inactive, active elsewhere in VRS	9,086	48.54	4.40	\$3,978
Teachers:				
Inactive, Vested	28,677	48.40	9.16	\$7,609
Long Term Disability	15	47.11	3.45	\$12,274
Inactive, active elsewhere in VRS	5,974	50.01	5.61	\$5,626
State Police:				
Inactive, Vested	184	42.65	8.22	\$8,699
Long Term Disability	25	46.47	11.59	\$50,769
Inactive, active elsewhere in VRS	229	43.09	5.06	\$7,016
Judicial:				
Inactive, Vested	6	59.24	5.50	\$32,439
Long Term Disability	0	N/A	N/A	N/A
Inactive, active elsewhere in VRS	5	55.27	8.92	\$59,130
Virginia Law Officers:				
Inactive, Vested	1,340	45.27	6.67	\$5,302
Long Term Disability	499	50.07	8.23	\$27,329
Inactive, active elsewhere in VRS	3,493	42.47	4.57	\$4,384
Political Subdivisions*:				
Inactive, Vested	20,372	50.24	6.78	\$5,121
Long Term Disability	55	53.60	3.35	\$7,997
Inactive, active elsewhere in VRS	35,088	46.93	4.32	\$4,209
Total:				
Inactive, Vested	65,134	49.56	8.20	\$6,707
Long Term Disability	2,599	55.50	14.84	\$24,706
Inactive, active elsewhere in VRS	53,875	47.24	4.50	\$4,356

\* Includes count for each plan from which members are entitled to deferred pension benefits. Therefore, members with benefits from more than one political subdivision are counted more than once. This includes counts for Political Subdivisions with no active members.



*Section II – Membership Data*

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5. The five tables of Schedule H, which can be found at the end of this document, show the distribution by age and service of the number and average annual compensation of active members for each division included in the valuation.



Section III – Assets

- Schedule C shows the additions and deductions to the assets of VRS for the year preceding the valuation date and a reconciliation of the fund balances at market value. As of June 30, 2021, the market value of assets used to determine the actuarial value of assets for each division is shown below:

**TABLE 5**  
**COMPARISON OF MARKET VALUE OF ASSETS**  
**(\$ IN THOUSANDS)**

DIVISION	JUNE 30, 2021 MARKET VALUE	JUNE 30, 2020 MARKET VALUE
State Employees	\$23,112,417	\$18,770,068
Teachers	45,617,878	36,449,229
State Police	1,050,148	854,762
Judicial	673,152	549,455
Virginia Law Officers	1,868,924	1,500,469
Political Subdivisions*	<u>26,558,350</u>	<u>21,234,091</u>
Total Market Value of Assets	\$98,880,869	\$79,358,074

\* Includes Political Subdivisions with no active members.

- Schedule B shows the development of the actuarial value of assets as of June 30, 2021. The following table shows the actuarial value of assets allocated among all divisions.

**TABLE 6**  
**COMPARISON OF ACTUARIAL VALUE OF ASSETS**  
**(\$ IN THOUSANDS)**

DIVISION	JUNE 30, 2021 ACTUARIAL VALUE	JUNE 30, 2020 ACTUARIAL VALUE
State Employees	\$20,615,301	\$19,333,674
Teachers	40,725,782	37,556,121
State Police	937,332	880,834
Judicial	600,670	566,239
Virginia Law Officers	1,668,802	1,546,528
Political Subdivisions*	<u>23,686,882</u>	<u>21,869,927</u>
Total Actuarial Value of Assets	\$88,234,769	\$81,753,323

\* Includes Political Subdivisions with no active members.



Section IV – Contribution Rates

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1. The actuarially determined employer contribution rates as a percent of payroll for each division based on the June 30, 2021 actuarial valuation are shown in the following table:

**TABLE 7**

Division	Employer Contribution Rate Defined Benefit Plan	Employer Contribution Rate Defined Contribution Plan	Employer Contribution Rate Retirement Plans
State Employees	13.07%	1.06%	14.13%
Teachers	13.95	0.81	14.76
State Police	29.98	N/A	29.98
Judicial	28.81	1.86	30.67
Virginia Law Officers	24.60	N/A	24.60

The rates shown are net of member contributions.





Section IV – Contribution Rates

2. The table below shows the development of the normal contribution rate, the unfunded accrued liability (UAL) rate, the actuarially recommended defined benefit plan contribution rate, the employer defined contribution plan rate and the total employer retirement plans contribution rate for each division as of June 30, 2021.

**TABLE 8**  
**EMPLOYER CONTRIBUTION RATE**  
**EXPRESSED AS PERCENT OF ACTIVE MEMBER PAYROLL**

	State Employees	Teachers	State Police	Judicial	Virginia Law Officers
<u>Employer Contribution Rate for Defined Benefit Plan</u>					
Normal Cost					
Service Retirement Benefits	5.66%	7.67%	13.95%	23.71%	7.63%
Disability Benefits	0.96%	0.54%	1.51%	0.00%	3.52%
Survivor Benefits	0.32%	0.15%	0.53%	0.90%	0.23%
Separation Benefits	<u>2.35%</u>	<u>1.89%</u>	<u>2.06%</u>	<u>0.00%</u>	<u>4.73%</u>
Total	9.29%	10.25%	18.05%	24.61%	16.11%
Member Current Contributions	<u>4.53%</u>	<u>4.62%</u>	<u>5.00%</u>	<u>4.38%</u>	<u>5.00%</u>
Employer Normal Cost	4.76%	5.63%	13.05%	20.23%	11.11%
Administrative Expense	0.29%	0.28%	0.38%	0.44%	0.27%
Amortization of UAAL ( <i>net of deferred contributions</i> ) *	8.02%	8.04%	16.55%	8.14%	13.22%
Amortization of Deferred Contributions *	0.00%	0.00%	0.00%	0.00%	0.00%
Actuarially Recommended Employer Defined Benefit Plan Contribution Rate to pay Normal Cost and amortize UAAL	13.07%	13.95%	29.98%	28.81%	24.60%
<u>Defined Contribution Hybrid Plan</u>	1.06%	0.81%	N/A	1.86%	N/A
Employer Contribution Rate for Retirement Plans	14.13%	14.76%	29.98%	30.67%	24.60%

\* The amortization period of the unfunded less the deferred contribution is amortized over a closed 30-year period beginning June 30, 2013 and will decrease by one each year until reaching 0 years. Each subsequent year a new base will be added to the unfunded accrued liability and will be amortized over a closed 20-year period. The deferred contribution, as defined under the 2011 Appropriation Act, Item 469(1)(6), has been paid off as of June 30, 2021.



Section V – Derivation of Experience Gains and Losses

**CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITIES (UAAL)  
DURING FISCAL YEAR 2021  
(\$ IN THOUSANDS)**

	State Employees	Teachers	State Police	Judicial	Virginia Law Officers	Political Subdivisions	Total
<b>A. Calculation of Expected Unfunded Actuarial Accrued Liability</b>							
1. UAAL as of June 30, 2020	\$ 6,417,661	\$ 13,278,662	\$ 325,590	\$ 111,633	\$ 712,025	\$ 3,437,211	\$ 24,282,782
2. Normal Cost for previous year	379,113	888,914	20,648	18,113	44,596	574,451	1,925,834
3. Actual contributions during the year	(803,203)	(1,873,018)	(39,745)	(24,381)	(93,074)	(824,466)	(3,657,887)
4. Interest at previous year's rate of 0.0675							
a. on UAAL	433,192	896,310	21,977	7,535	48,062	232,012	1,639,088
b. on normal cost	25,590	60,002	1,394	1,223	3,010	38,775	129,994
c. on contributions	(27,108)	(63,214)	(1,341)	(823)	(3,141)	(27,826)	(123,453)
d. total: (a)+(b)+(c)	\$ 431,674	\$ 893,098	\$ 22,030	\$ 7,935	\$ 47,931	\$ 242,961	\$ 1,645,629
5. Expected UAAL as of June 30, 2021 A1+A2+A3+A4	6,425,245	13,187,656	328,523	113,300	711,478	3,430,157	24,196,358
6. Actual UAAL as of June 30, 2021	6,112,670	12,021,814	389,314	132,738	738,351	3,480,933	22,875,820
7. Total Gain/(Loss): A5-A6	\$ 312,575	\$ 1,165,842	\$ (60,791)	\$ (19,438)	\$ (26,873)	\$ (50,775)	\$ 1,320,539
<b>B. Calculation of Asset Gain/(Loss)</b>							
1. Actuarial Value of Assets (AVA) as of June 30, 2020	\$ 19,333,674	\$ 37,556,121	\$ 880,834	\$ 566,239	\$ 1,546,528	\$ 21,869,927	\$ 81,753,323
2. Contributions during the year	\$ 803,203	\$ 1,873,018	\$ 39,745	\$ 24,381	\$ 93,074	\$ 824,466	\$ 3,657,887
3. Benefit payments during the year	(1,516,016)	(2,591,617)	(73,498)	(47,885)	(129,836)	(1,279,534)	(5,638,386)
4. Interest at previous year's rate of 0.0675							
a. on AVA at beginning of year	\$ 1,305,023	\$ 2,535,038	\$ 59,456	\$ 38,221	\$ 104,391	\$ 1,476,220	\$ 5,518,349
b. on contributions	27,108	63,214	1,341	823	3,141	27,826	123,453
c. on benefit payments	(51,166)	(87,467)	(2,481)	(1,616)	(4,382)	(43,184)	(190,296)
d. total: (a)+(b)+(c)	\$ 1,280,965	\$ 2,510,785	\$ 58,316	\$ 37,428	\$ 103,150	\$ 1,460,862	\$ 5,451,506
5. Expected AVA as of June 30, 2021 B1+B2+B3+B4	19,901,826	39,348,307	905,397	580,163	1,612,916	22,875,721	85,224,330
6. Actual AVA as of June 30, 2021	20,615,301	40,725,782	937,332	600,670	1,668,802	23,686,882	88,234,769
7. Gain/(Loss) on assets: B6-B5	\$ 713,475	\$ 1,377,475	\$ 31,935	\$ 20,507	\$ 55,886	\$ 811,161	\$ 3,010,439
<b>C. Calculation of Liability Gain/(Loss)</b>							
1. Gain/(Loss) due to plan amendments	0	0	0	0	0	(5,078)	(5,078)
2. Gain/(Loss) due to change in assumptions	(401,835)	(876,190)	(59,081)	(51,439)	(67,931)	(943,841)	(2,400,317)
3. Liability Experience Gain/(Loss): A7-B7-C1-C2	\$ 935	\$ 664,557	\$ (33,645)	\$ 11,494	\$ (14,828)	\$ 86,983	\$ 715,495



Section V – Derivation of Experience Gains and Losses

**GAINS & LOSSES  
DURING FISCAL YEAR 2021  
(\$ IN MILLIONS)**

Type of Activity	State Employees	Teachers	State Police	Judicial	Virginia Law Officers	Political Subdivisions
<b>Age &amp; Service Retirements.</b> If members retire at older ages, there is a gain. If younger ages, a loss.	\$36.7	(\$37.5)	(\$1.3)	\$9.0	(\$26.3)	(\$70.9)
<b>Disability Before Retirement.</b> If disability claims are less than assumed, there is a gain. If more claims, a loss.	(\$1.0)	\$15.2	\$0.3	\$0.0	(\$0.6)	\$19.6
<b>Death-in Service Benefits.</b> If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	\$5.6	(\$5.1)	\$0.1	\$0.1	\$0.1	\$0.1
<b>Withdrawal from Employment.</b> If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(\$33.7)	(\$15.3)	\$0.6	\$0.5	\$10.4	(\$1.1)
<b>Pay Increases.</b> If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(\$204.8)	\$344.7	(\$31.0)	(\$0.7)	(\$22.6)	(\$44.6)
<b>New Members/Rehires.</b> Additional unfunded accrued liability will produce a loss.	(\$15.5)	(\$150.4)	(\$0.3)	\$0.0	(\$3.1)	(\$20.9)
<b>Death after Retirement.</b> If retirants live longer than assumed, there is a loss. If not as long, a gain.	\$38.7	\$77.5	(\$6.0)	(\$3.3)	\$13.0	\$46.7
<b>Census Data Experience.</b>	(\$28.8)	(\$9.4)	(\$2.3)	\$1.2	(\$0.3)	(\$36.8)
<b>Benefit Payments.</b> If benefit payments are greater than expected, there is a loss. If the benefits payments are less, a gain.	\$17.9	\$91.7	(\$2.1)	(\$0.8)	(\$1.4)	\$35.6
<b>Cost of Living Allowance (COLA).</b> If COLA is greater than expected, there is a loss. If COLA is less, a gain.	\$185.8	\$353.1	\$8.4	\$5.5	\$15.9	\$159.2
<b>Investment Income.</b> If there is a greater investment income than assumed, there is a gain. If less income, a loss.	\$713.5	\$1,377.5	\$31.9	\$20.5	\$55.9	\$811.2
<b>Gain (Loss) During Year</b>	\$714.4	\$2,042.0	(\$1.7)	\$32.0	\$41.0	\$898.1
<b>Non-Recurring Items.</b> Adjustments for plan amendments, assumption changes, etc.	(\$401.8)	(\$876.2)	(\$59.1)	(\$51.4)	(\$67.9)	(\$948.9)
<b>Total Gain (Loss) During Year</b>	\$312.6	\$1,165.8	(\$60.8)	(\$19.4)	(\$26.9)	(\$50.8)
<b>Expected Contributions vs. Actual Contributions.</b> If the difference in the actual contribution to the plan is more or less than what was expected based on the previous valuation then there will be a gain or loss associated with this difference.	\$26.2	\$97.3	(\$0.7)	\$0.7	\$3.1	\$49.9
<b>Experience Gain (Loss) During Year (Gain (Loss) During Year Plus Contribution Gain (Loss))</b>	\$740.6	\$2,139.3	(\$2.4)	\$32.7	\$44.1	\$948.0



## Section VI – Risk Considerations

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Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September 2017, Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, was first applicable for the June 30, 2019 actuarial valuation for the Virginia Retirement System (the System).

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. If plan assets are depleted, benefits may not be paid which could create legal risk or the plan could become “pay as you go.” The term “risk” is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates.

There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including the impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay; and
- external risks such as the regulatory and political environment.

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. There is a risk if the funded status declines significantly that the level of contributions required to return the System to being well-funded would be higher than employers could afford.

The other significant risk factor for the System is investment return because of the volatility of returns and the size of plan assets compared to payroll. While over the long term the fund has had investment returns in excess of the assumed rate of return, annual market volatility results in one-year returns that are rarely exactly as assumed, causing annual returns that fluctuate above or below the long-term assumed rate of return. While this is to be expected, managing the investment risk is imperative to the long-term health of the fund.

A key demographic risk for all retirement systems is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions anticipate some improvements in mortality experience over time and these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase



## Section VI – Risk Considerations

liabilities. Likewise, as we have recently seen with COVID-19, a public health crisis can result in a significant number of additional deaths in a short period of time, which can influence plan liabilities and future funding needs. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.

The following summarizes some historical information that helps indicate how certain key risk metrics have changed over time. Many are due to the maturing of the retirement system.

### Historical Asset Volatility Ratios

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan’s contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions. Dollar amounts in the following charts are given in thousands.

#### State Employees

ACTUARIAL VALUATION DATE	MARKET VALUE OF ASSETS	COVERED PAYROLL	ASSET VOLATILITY RATIO
June 30, 2017	\$17,789,888	\$4,037,072	4.41
June 30, 2018	\$18,532,189	\$4,161,922	4.45
June 30, 2019	\$19,090,110	\$4,375,061	4.36
June 30, 2020	\$18,770,068	\$4,428,496	4.24
June 30, 2021	\$23,112,417	\$4,594,347	5.03

#### Teachers

ACTUARIAL VALUATION DATE	MARKET VALUE OF ASSETS	COVERED PAYROLL	ASSET VOLATILITY RATIO
June 30, 2017	\$33,119,545	\$7,919,450	4.18
June 30, 2018	\$34,919,563	\$8,086,933	4.32
June 30, 2019	\$36,522,769	\$8,210,129	4.45
June 30, 2020	\$36,449,229	\$8,498,519	4.29
June 30, 2021	\$45,617,878	\$8,556,997	5.33



## Section VI – Risk Considerations

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### State Police

ACTUARIAL VALUATION DATE	MARKET VALUE OF ASSETS	COVERED PAYROLL	ASSET VOLATILITY RATIO
June 30, 2017	\$796,073	\$110,265	7.22
June 30, 2018	\$836,702	\$126,523	6.61
June 30, 2019	\$865,273	\$132,230	6.54
June 30, 2020	\$854,762	\$131,255	6.51
June 30, 2021	\$1,050,148	\$142,795	7.35

### Judicial

ACTUARIAL VALUATION DATE	MARKET VALUE OF ASSETS	COVERED PAYROLL	ASSET VOLATILITY RATIO
June 30, 2017	\$512,749	\$66,288	7.74
June 30, 2018	\$540,009	\$67,424	8.01
June 30, 2019	\$557,541	\$76,848	7.26
June 30, 2020	\$549,455	\$74,734	7.35
June 30, 2021	\$673,152	\$79,125	8.51

### Virginia Law Officers

ACTUARIAL VALUATION DATE	MARKET VALUE OF ASSETS	COVERED PAYROLL	ASSET VOLATILITY RATIO
June 30, 2017	\$1,345,887	\$339,150	3.97
June 30, 2018	\$1,423,980	\$346,106	4.11
June 30, 2019	\$1,495,990	\$369,776	4.05
June 30, 2020	\$1,500,469	\$363,896	4.12
June 30, 2021	\$1,868,924	\$351,086	5.32



## Section VI – Risk Considerations

### Historical Cash Flows

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments. Note that negative cash flows are expected in mature retirement systems. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 5% of MVA that may cause significant concerns. Each VRS system has had negative cash flows from 0% to 4% in recent years, so there is no concern for the foreseeable future.

#### State Employees

FISCAL YEAR ENDING	MARKET VALUE OF ASSETS	CONTRIBUTIONS AND REVENUE	BENEFIT PAYMENTS AND EXPENSES	NET CASH FLOW	NET CASH FLOW AS A PERCENT OF MVA
June 30, 2017	\$17,789,888	\$737,270	(\$1,279,035)	(\$541,765)	-3.05%
June 30, 2018	\$18,532,189	\$750,350	(\$1,339,942)	(\$589,592)	-3.18%
June 30, 2019	\$19,090,110	\$747,636	(\$1,401,437)	(\$653,801)	-3.42%
June 30, 2020	\$18,770,068	\$787,762	(\$1,468,865)	(\$681,103)	-3.63%
June 30, 2021	\$23,112,417	\$817,294	(\$1,530,107)	(\$712,813)	-3.08%

#### Teachers

FISCAL YEAR ENDING	MARKET VALUE OF ASSETS	CONTRIBUTIONS AND REVENUE	BENEFIT PAYMENTS AND EXPENSES	NET CASH FLOW	NET CASH FLOW AS A PERCENT OF MVA
June 30, 2017	\$33,119,545	\$1,531,558	(\$2,212,515)	(\$680,957)	-2.06%
June 30, 2018	\$34,919,563	\$1,684,990	(\$2,306,129)	(\$621,139)	-1.78%
June 30, 2019	\$36,522,769	\$1,685,314	(\$2,393,136)	(\$707,822)	-1.94%
June 30, 2020	\$36,449,229	\$1,747,502	(\$2,510,054)	(\$762,552)	-2.09%
June 30, 2021	\$45,617,878	\$1,897,785	(\$2,616,384)	(\$718,599)	-1.58%



## Section VI – Risk Considerations

### State Police

FISCAL YEAR ENDING	MARKET VALUE OF ASSETS	CONTRIBUTIONS AND REVENUE	BENEFIT PAYMENTS AND EXPENSES	NET CASH FLOW	NET CASH FLOW AS A PERCENT OF MVA
June 30, 2017	\$796,073	\$37,589	(\$59,469)	(\$21,880)	-2.75%
June 30, 2018	\$836,702	\$42,117	(\$59,636)	(\$17,519)	-2.09%
June 30, 2019	\$865,273	\$37,816	(\$64,037)	(\$26,221)	-3.03%
June 30, 2020	\$854,762	\$39,097	(\$65,940)	(\$26,843)	-3.14%
June 30, 2021	\$1,050,148	\$40,277	(\$74,030)	(\$33,753)	-3.21%

### Judicial

FISCAL YEAR ENDING	MARKET VALUE OF ASSETS	CONTRIBUTIONS AND REVENUE	BENEFIT PAYMENTS AND EXPENSES	NET CASH FLOW	NET CASH FLOW AS A PERCENT OF MVA
June 30, 2017	\$512,749	\$30,884	(\$41,553)	(\$10,669)	-2.08%
June 30, 2018	\$540,009	\$31,327	(\$41,533)	(\$10,206)	-1.89%
June 30, 2019	\$557,541	\$26,098	(\$43,938)	(\$17,840)	-3.20%
June 30, 2020	\$549,455	\$28,254	(\$46,831)	(\$18,577)	-3.38%
June 30, 2021	\$673,152	\$24,724	(\$48,228)	(\$23,504)	-3.49%

### Virginia Law Officers

FISCAL YEAR ENDING	MARKET VALUE OF ASSETS	CONTRIBUTIONS AND REVENUE	BENEFIT PAYMENTS AND EXPENSES	NET CASH FLOW	NET CASH FLOW AS A PERCENT OF MVA
June 30, 2017	\$1,345,887	\$91,414	(\$103,012)	(\$11,598)	-0.86%
June 30, 2018	\$1,423,980	\$91,289	(\$111,488)	(\$20,199)	-1.42%
June 30, 2019	\$1,495,990	\$93,198	(\$115,060)	(\$21,862)	-1.46%
June 30, 2020	\$1,500,469	\$98,626	(\$122,725)	(\$24,099)	-1.61%
June 30, 2021	\$1,868,924	\$94,017	(\$130,779)	(\$36,762)	-1.97%





## Section VI – Risk Considerations

### Comparison of Valuation Results Under Alternate Investment Return Assumptions

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates. For example, if the expected return is decreased, it will result in an increase in the liability of the plan as well as the actuarial contributions. Conversely, if we increase the expected return, it will result in a decrease in the liability of the plan as well as the actuarial contributions. The impacts of positive or negative changes in the assumed rate of return are shown in the tables below (dollar amounts in thousands):

#### State Employees

Discount Rate	Current				
	8.75%	7.75%	6.75%	5.75%	4.75%
Total Normal Cost Rate	6.39%	7.62%	9.29%	11.61%	14.85%
Member Contribution Rate	4.53%	4.53%	4.53%	4.53%	4.53%
Employer Normal Cost Rate	1.86%	3.09%	4.76%	7.08%	10.32%
Administrative Expense Load	0.29%	0.29%	0.29%	0.29%	0.29%
Total Employer Normal Cost Rate	2.15%	3.38%	5.05%	7.37%	10.61%
Total Amortization Rate	0.86%	4.40%	8.02%	11.73%	15.53%
Defined Contribution Hybrid Plan	1.06%	1.06%	1.06%	1.06%	1.06%
Total Employer Rate	4.07%	8.84%	14.13%	20.16%	27.20%
Change in Employer Rate	(10.06)%	(5.29)%	0.00%	6.03%	13.07%
Estimated Change in Annual Funding	(462,191)	(243,041)		277,039	600,481
Unfunded Liability	1,171,017	3,428,843	6,112,670	9,316,998	13,154,218
Funded Status	94.6%	85.7%	77.1%	68.9%	61.0%

#### Teachers

Discount Rate	Current				
	8.75%	7.75%	6.75%	5.75%	4.75%
Total Normal Cost Rate	6.57%	8.13%	10.25%	13.15%	17.13%
Member Contribution Rate	4.62%	4.62%	4.62%	4.62%	4.62%
Employer Normal Cost Rate	1.95%	3.51%	5.63%	8.53%	12.51%
Administrative Expense Load	0.28%	0.28%	0.28%	0.28%	0.28%
Total Employer Normal Cost Rate	2.23%	3.79%	5.91%	8.81%	12.79%
Total Amortization Rate	(0.14)%	3.88%	8.04%	12.40%	16.99%
Defined Contribution Hybrid Plan	0.81%	0.81%	0.81%	0.81%	0.81%
Total Employer Rate	2.90%	8.48%	14.76%	22.02%	30.59%
Change in Employer Rate	(11.86)%	(6.28)%	0.00%	7.26%	15.83%
Estimated Change in Annual Funding	(1,014,860)	(537,379)		621,238	1,354,573
Unfunded Liability	1,235,369	6,125,484	12,021,814	19,191,062	27,981,858
Funded Status	97.1%	86.9%	77.2%	68.0%	59.3%



## Section VI – Risk Considerations

### State Police

Discount Rate	Current				
	8.75%	7.75%	6.75%	5.75%	4.75%
Total Normal Cost Rate	10.95%	13.99%	18.05%	23.48%	30.79%
Member Contribution Rate	5.00%	5.00%	5.00%	5.00%	5.00%
Employer Normal Cost Rate	5.95%	8.99%	13.05%	18.48%	25.79%
Administrative Expense Load	0.38%	0.38%	0.38%	0.38%	0.38%
Total Employer Normal Cost Rate	6.33%	9.37%	13.43%	18.86%	26.17%
Total Amortization Rate	5.10%	10.74%	16.55%	22.57%	28.85%
Defined Contribution Hybrid Plan	N/A	N/A	N/A	N/A	N/A
Total Employer Rate	11.43%	20.11%	29.98%	41.43%	55.02%
Change in Employer Rate	(18.55)%	(9.87)%	0.00%	11.45%	25.04%
Estimated Change in Annual Funding	(26,488)	(14,094)		16,350	35,756
Unfunded Liability	130,806	248,742	389,314	558,172	762,644
Funded Status	87.8%	79.0%	70.7%	62.7%	55.1%

### Judicial

Discount Rate	Current				
	8.75%	7.75%	6.75%	5.75%	4.75%
Total Normal Cost Rate	17.45%	20.66%	24.61%	29.48%	35.54%
Member Contribution Rate	4.38%	4.38%	4.38%	4.38%	4.38%
Employer Normal Cost Rate	13.07%	16.28%	20.23%	25.10%	31.16%
Administrative Expense Load	0.44%	0.44%	0.44%	0.44%	0.44%
Total Employer Normal Cost Rate	13.51%	16.72%	20.67%	25.54%	31.60%
Total Amortization Rate	(1.85)%	3.17%	8.14%	13.08%	18.01%
Defined Contribution Hybrid Plan	1.86%	1.86%	1.86%	1.86%	1.86%
Total Employer Rate	13.52%	21.75%	30.67%	40.48%	51.47%
Change in Employer Rate	(17.15)%	(8.92)%	0.00%	9.81%	20.80%
Estimated Change in Annual Funding	(13,570)	(7,058)		7,762	16,458
Unfunded Liability	15,367	69,800	132,738	205,959	291,701
Funded Status	97.5%	89.6%	81.9%	74.5%	67.3%

### Virginia Law Officers

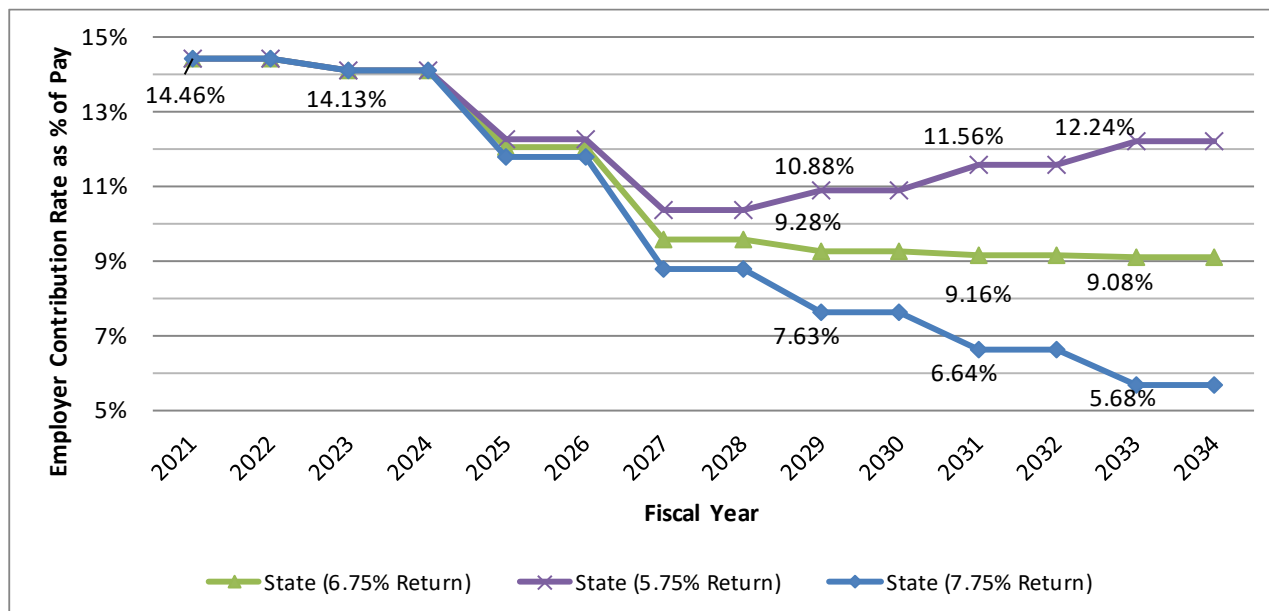
Discount Rate	Current				
	8.75%	7.75%	6.75%	5.75%	4.75%
Total Normal Cost Rate	10.93%	13.13%	16.11%	20.17%	25.79%
Member Contribution Rate	5.00%	5.00%	5.00%	5.00%	5.00%
Employer Normal Cost Rate	5.93%	8.13%	11.11%	15.17%	20.79%
Administrative Expense Load	0.27%	0.27%	0.27%	0.27%	0.27%
Total Employer Normal Cost Rate	6.20%	8.40%	11.38%	15.44%	21.06%
Total Amortization Rate	4.55%	8.79%	13.22%	17.92%	22.95%
Defined Contribution Hybrid Plan	N/A	N/A	N/A	N/A	N/A
Total Employer Rate	10.75%	17.19%	24.60%	33.36%	44.01%
Change in Employer Rate	(13.85)%	(7.41)%	0.00%	8.76%	19.41%
Estimated Change in Annual Funding	(48,625)	(26,015)		30,755	68,146
Unfunded Liability	255,768	474,208	738,351	1,061,180	1,460,169
Funded Status	86.7%	77.9%	69.3%	61.1%	53.3%



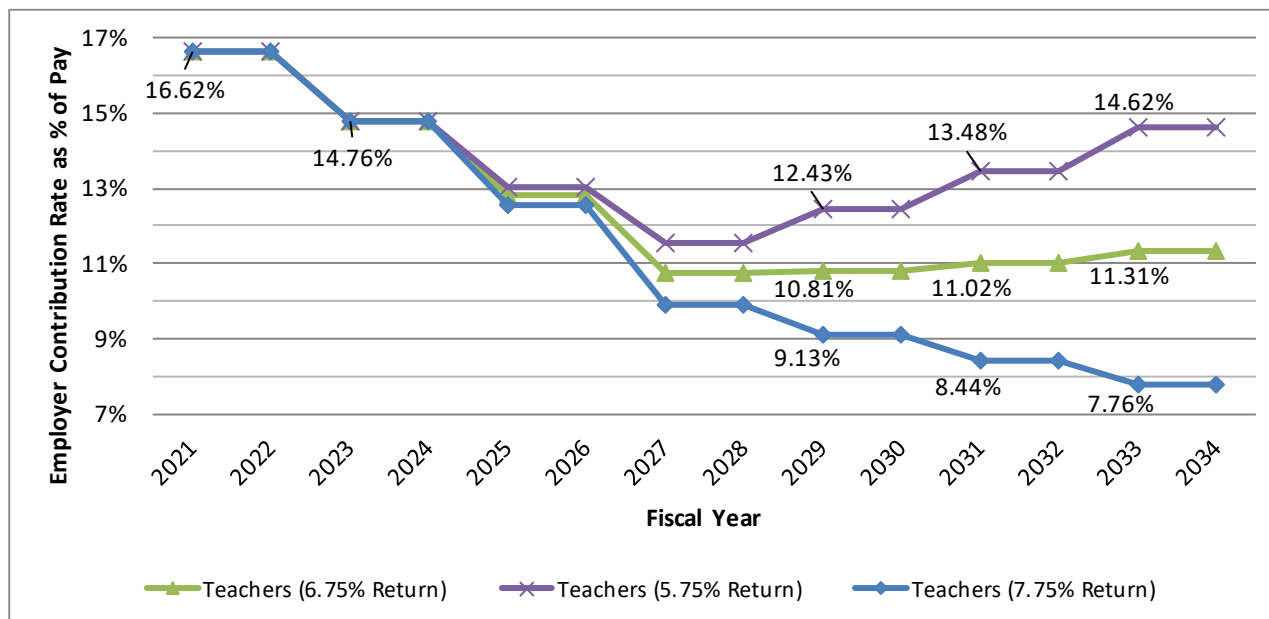
## Section VI – Risk Considerations

In addition to the current year’s valuation results given above for all of the statewide plans, the following charts show a projection of future contributions assuming actual investment returns vary 1 percent above and below the current assumed rate of return over the projection period for both the State and Teachers plans.

### State Employees



### Teachers





*Schedule A – Valuation Balance Sheet*

**STATE EMPLOYEES**  
**As of June 30, 2021**

<b>PRESENT AND PROSPECTIVE ASSETS</b>		
Actuarial Value of Assets	\$	20,615,301,000
Present value of future members' contributions		1,473,594,613
Present value of future employer contributions		
Normal contributions	\$	1,480,509,953
Unfunded accrued liability contributions		<u>6,112,669,994</u>
Total prospective employer contributions		<u>7,593,179,947</u>
Total Present and Prospective Assets	\$	<u><u>29,682,075,560</u></u>
<b>ACTUARIAL LIABILITIES</b>		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits	\$	15,726,838,695
Present value of prospective benefits payable on account of inactive members		1,434,842,932
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$	10,775,477,840
Disability retirement benefits		630,278,409
Survivor benefits		300,388,736
Separation benefits		<u>814,248,948</u>
Total		<u>12,520,393,933</u>
Total Actuarial Liabilities	\$	<u><u>29,682,075,560</u></u>



Schedule A – Valuation Balance Sheet

**TEACHERS**  
**As of June 30, 2021**

<b>PRESENT AND PROSPECTIVE ASSETS</b>		
Actuarial Value of Assets		\$ 40,725,782,000
Present value of future members' contributions		3,554,355,485
Present value of future employer contributions		
Normal contributions	\$ 4,064,691,062	
Unfunded accrued liability contributions	<u>12,021,814,491</u>	
Total prospective employer contributions		<u>16,086,505,553</u>
Total Present and Prospective Assets		<u>\$ 60,366,643,038</u>
<b>ACTUARIAL LIABILITIES</b>		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 29,671,366,233
Present value of prospective benefits payable on account of inactive members		1,825,419,008
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 26,298,862,985	
Disability retirement benefits	856,762,628	
Survivor benefits	335,876,280	
Separation benefits	<u>1,378,355,904</u>	
Total		<u>28,869,857,797</u>
Total Actuarial Liabilities		<u>\$ 60,366,643,038</u>



Schedule A – Valuation Balance Sheet

**STATE POLICE**  
**As of June 30, 2021**

<b>PRESENT AND PROSPECTIVE ASSETS</b>		
Actuarial Value of Assets		\$ 937,332,000
Present value of future members' contributions		65,802,906
Present value of future employer contributions		
Normal contributions	\$ 170,116,715	
Unfunded accrued liability contributions	<u>389,313,969</u>	
Total prospective employer contributions		<u>559,430,684</u>
Total Present and Prospective Assets		<u>\$ 1,562,565,590</u>
<b>ACTUARIAL LIABILITIES</b>		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 751,995,808
Present value of prospective benefits payable on account of inactive members		30,491,042
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 687,540,432	
Disability retirement benefits	38,907,152	
Survivor benefits	13,749,091	
Separation benefits	<u>39,882,065</u>	
Total		<u>780,078,740</u>
Total Actuarial Liabilities		<u>\$ 1,562,565,590</u>



Schedule A – Valuation Balance Sheet

**JUDICIAL**  
**As of June 30, 2021**

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets	\$	600,670,000
Present value of future members' contributions		27,981,101
Present value of future employer contributions		
Normal contributions	\$	107,661,492
Unfunded accrued liability contributions		<u>132,737,599</u>
Total prospective employer contributions		<u>240,399,091</u>
Total Present and Prospective Assets	\$	<u><u>869,050,192</u></u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits	\$	494,665,744
Present value of prospective benefits payable on account of inactive members		4,111,032
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$	360,492,184
Disability retirement benefits		-
Survivor benefits		9,781,232
Separation benefits		<u>-</u>
Total		<u>370,273,416</u>
Total Actuarial Liabilities	\$	<u><u>869,050,192</u></u>



Schedule A – Valuation Balance Sheet

**VIRGINIA LAW OFFICERS**  
**As of June 30, 2021**

<b>PRESENT AND PROSPECTIVE ASSETS</b>		
Actuarial Value of Assets		\$ 1,668,802,000
Present value of future members' contributions		84,345,254
Present value of future employer contributions		
Normal contributions	\$ 179,434,379	
Unfunded accrued liability contributions	<u>738,351,494</u>	
Total prospective employer contributions		<u>917,785,873</u>
Total Present and Prospective Assets		<u><u>\$ 2,670,933,127</u></u>
<b>ACTUARIAL LIABILITIES</b>		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 1,388,718,763
Present value of prospective benefits payable on account of inactive members		252,156,788
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 796,107,651	
Disability retirement benefits	109,097,300	
Survivor benefits	10,875,930	
Separation benefits	<u>113,976,695</u>	
Total		<u>1,030,057,576</u>
Total Actuarial Liabilities		<u><u>\$ 2,670,933,127</u></u>





Schedule A – Valuation Balance Sheet

**POLITICAL SUBDIVISIONS**  
**As of June 30, 2021**

<b>PRESENT AND PROSPECTIVE ASSETS</b>		
Actuarial Value of Assets		\$ 23,686,882,000
Present value of future members' contributions		1,740,949,785
Present value of future employer contributions		
Normal contributions	\$ 3,272,597,436	
Unfunded accrued liability contributions	<u>3,480,932,540</u>	
Total prospective employer contributions		<u>6,753,529,976</u>
Total Present and Prospective Assets		<u><u>\$ 32,181,361,761</u></u>
<b>ACTUARIAL LIABILITIES</b>		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 14,141,202,402
Present value of prospective benefits payable on account of inactive members		1,728,410,249
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 13,913,092,113	
Disability retirement benefits	1,011,467,474	
Survivor benefits	285,660,120	
Separation benefits	<u>1,101,529,403</u>	
Total		<u>16,311,749,110</u>
Total Actuarial Liabilities		<u><u>\$ 32,181,361,761</u></u>



Schedule A – Solvency Test

**SOLVENCY TEST**

**Virginia Retirement System (State Employees, Teachers, and Political Subdivisions)**  
**(\$ in thousands)**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$14,452,659	\$64,528,079	\$27,662,643	\$106,643,382	\$85,027,965	100.00%	100.00%	21.86%
6/30/2020	14,082,163	60,926,216	26,884,877	101,893,256	78,759,722	100.00	100.00	13.95
6/30/2019	13,613,905	58,337,920	27,182,146	99,133,971	76,244,148	100.00	100.00	15.79
6/30/2018	13,221,525	54,132,392	25,820,901	93,174,818	73,204,795	100.00	100.00	22.66
6/30/2017	12,887,047	51,247,606	25,716,631	89,851,284	69,214,246	100.00	100.00	19.75

**State Employees Retirement System**  
**(\$ in thousands)**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$3,566,175	\$17,161,682	\$6,000,114	\$26,727,971	\$20,615,301	100.00%	99.34%	0.00%
6/30/2020	3,514,856	16,410,519	5,825,960	25,751,335	19,333,674	100.00	96.39	0.00
6/30/2019	3,459,343	15,831,694	6,107,151	25,398,188	18,932,104	100.00	97.73	0.00
6/30/2018	3,416,685	14,911,769	5,786,703	24,115,157	18,392,939	100.00	100.00	1.11
6/30/2017	3,374,835	14,148,870	5,787,829	23,311,534	17,547,764	100.00	100.00	0.42



Schedule A – Solvency Test

**Teachers Retirement System**  
(\$ in thousands)

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$7,036,408	\$31,496,785	\$14,214,403	\$52,747,596	\$40,725,782	100.00%	100.00%	15.43%
6/30/2020	6,811,064	30,055,902	13,967,817	50,834,783	37,556,121	100.00	100.00	4.93
6/30/2019	6,520,986	28,810,438	13,972,535	49,303,959	36,233,796	100.00	100.00	6.46
6/30/2018	6,282,723	26,726,567	13,506,886	46,516,176	34,673,952	100.00	100.00	12.32
6/30/2017	6,082,982	25,474,535	13,448,500	45,006,017	32,684,868	100.00	100.00	8.38

**Political Subdivisions Retirement System**  
(\$ in thousands)

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$3,850,076	\$15,869,613	\$7,448,126	\$27,167,815	\$23,686,882	100.00%	100.00%	53.26%
6/30/2020	3,756,243	14,459,794	7,091,101	25,307,138	21,869,927	100.00	100.00	51.53
6/30/2019	3,633,576	13,695,788	7,102,460	24,431,824	21,078,248	100.00	100.00	52.78
6/30/2018	3,522,117	12,494,055	6,527,313	22,543,485	20,137,904	100.00	100.00	63.15
6/30/2017	3,429,230	11,624,201	6,480,302	21,533,733	18,981,614	100.00	100.00	60.62



Schedule A – Solvency Test

**State Police Retirement System**  
(\$ in thousands)

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$106,923	\$782,487	\$437,236	\$1,326,646	\$937,332	100.00%	100.00%	10.96%
6/30/2020	109,787	707,082	389,555	1,206,424	880,834	100.00	100.00	16.42
6/30/2019	105,943	682,809	392,368	1,181,120	858,632	100.00	100.00	17.81
6/30/2018	103,710	646,580	362,603	1,112,893	830,978	100.00	100.00	22.25
6/30/2017	99,643	622,206	318,779	1,040,628	785,677	100.00	100.00	20.02

**Judicial Retirement System**  
(\$ in thousands)

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$42,082	\$498,777	\$192,549	\$733,408	\$600,670	100.00%	100.00%	31.06%
6/30/2020	42,320	452,071	183,481	677,872	566,239	100.00	100.00	39.16
6/30/2019	42,660	427,846	199,235	669,741	553,136	100.00	100.00	41.47
6/30/2018	41,009	413,609	191,044	645,662	536,022	100.00	100.00	42.61
6/30/2017	39,104	407,862	184,556	631,522	505,834	100.00	100.00	31.90



Schedule A – Solvency Test

**Virginia Law Officers Retirement System**  
**(\$ in thousands)**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$251,678	\$1,640,876	\$514,599	\$2,407,153	\$1,668,802	100.00%	86.36%	0.00%
6/30/2020	250,900	1,498,644	509,009	2,258,553	1,546,528	100.00	86.45	0.00
6/30/2019	244,233	1,432,206	534,799	2,211,238	1,484,995	100.00	86.63	0.00
6/30/2018	240,390	1,317,732	499,382	2,057,504	1,413,876	100.00	89.05	0.00
6/30/2017	240,517	1,219,673	517,591	1,977,781	1,328,178	100.00	89.18	0.00

**All Retirement Systems Combined**  
**(\$ in thousands)**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1)	(2)	(3)	Total		(1)	(2)	(3)
	Active Member Contributions	Retirees, Survivors and Inactive Members	Active Members (Employer Financed Portion)					
6/30/2021	\$14,853,342	\$67,450,219	\$28,807,028	\$111,110,589	\$88,234,769	100.00%	100.00%	20.59%
6/30/2020	14,485,170	63,584,014	27,966,921	106,036,105	81,753,323	100.00	100.00	13.17
6/30/2019	14,006,741	60,880,781	28,308,548	103,196,070	79,140,911	100.00	100.00	15.03
6/30/2018	13,606,634	56,510,313	26,873,930	96,990,877	75,985,671	100.00	100.00	21.84
6/30/2017	13,266,311	53,497,347	26,737,557	93,501,215	71,833,935	100.00	100.00	18.96



*Schedule B – Development of Actuarial Value of Assets*

**STATE EMPLOYEES  
For the Year Ending June 30, 2021  
(\$ in thousands)**

(1) Actuarial Value Beginning of Year	\$ 19,333,674
(2) Market Value End of Year	\$ 23,112,417
(3) Market Value Beginning of Year (Adjusted)	\$ 18,770,068
(4) Cash Flow	
a. Contributions	\$ 816,843
b. Benefit Payments	(1,516,016)
c. Administrative Expenses	(12,904)
d. Miscellaneous revenue and expenses	(736)
e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$ (712,813)
(5) Investment Income	
a. Market total: (2) – (3) – (4)e	\$ 5,055,162
b. Assumed Rate	6.75%
c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$ 1,242,922
d. Amount for Phased-in Recognition: (5)a – (5)c	\$ 3,812,240
(6) Phased-In Recognition of Investment Income	
a. Current Year: 0.20 x (5)d	\$ 762,448
b. First Prior Year	(180,907)
c. Second Prior Year	(12,530)
d. Third Prior Year	15,102
e. Fourth Prior Year	167,405
f. Total Recognized Investment Gain	\$ 751,518
(7) Adjustment to Beginning of Year Market Value	\$ 0
(8) Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f + (7)]	\$ 20,615,301



Schedule B – Development of Actuarial Value of Assets

**TEACHERS**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

(1) Actuarial Value Beginning of Year	\$ 37,556,121
(2) Market Value End of Year	\$ 45,617,878
(3) Market Value Beginning of Year	\$ 36,449,229
(4) Cash Flow	
a. Contributions	\$ 1,896,894
b. Benefit Payments	(2,591,617)
c. Administrative Expenses	(24,543)
d. Miscellaneous revenue and expenses	667
e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$ (718,599)
(5) Investment Income	
a. Market total: (2) – (3) – (4)e	\$ 9,887,248
b. Assumed Rate	6.75%
c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$ 2,436,070
d. Amount for Phased-in Recognition: (5)a – (5)c	\$ 7,451,178
(6) Phased-In Recognition of Investment Income	
a. Current Year: 0.20 x (5)d	\$ 1,490,236
b. First Prior Year	(350,108)
c. Second Prior Year	(21,714)
d. Third Prior Year	24,906
e. Fourth Prior Year	308,870
f. Total Recognized Investment Gain	\$ 1,452,190
(7) Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$ 40,725,782



Schedule B – Development of Actuarial Value of Assets

**STATE POLICE**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

(1) Actuarial Value Beginning of Year	\$	880,834
(2) Market Value End of Year	\$	1,050,148
(3) Market Value Beginning of Year	\$	854,762
(4) Cash Flow		
a. Contributions	\$	40,277
b. Benefit Payments		(73,498)
c. Administrative Expenses		(532)
d. Miscellaneous revenue and expenses		-
e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(33,753)
(5) Investment Income		
a. Market total: (2) – (3) – (4)e	\$	229,139
b. Assumed Rate		6.75%
c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	56,557
d. Amount for Phased-in Recognition: (5)a – (5)c	\$	172,582
(6) Phased-In Recognition of Investment Income		
a. Current Year: 0.20 x (5)d	\$	34,516
b. First Prior Year		(8,234)
c. Second Prior Year		(572)
d. Third Prior Year		607
e. Fourth Prior Year		7,377
f. Total Recognized Investment Gain	\$	33,694
(7) Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	937,332





Schedule B – Development of Actuarial Value of Assets

**JUDICIAL**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

(1) Actuarial Value Beginning of Year	\$	566,239
(2) Market Value End of Year	\$	673,152
(3) Market Value Beginning of Year	\$	549,455
(4) Cash Flow		
a. Contributions	\$	24,724
b. Benefit Payments		(47,885)
c. Administrative Expenses		(343)
d. Miscellaneous revenue and expenses		-
e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(23,504)
(5) Investment Income		
a. Market total: (2) – (3) – (4)e	\$	147,201
b. Assumed Rate		6.75%
c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	36,295
d. Amount for Phased-in Recognition: (5)a – (5)c	\$	110,906
(6) Phased-In Recognition of Investment Income		
a. Current Year: 0.20 x (5)d	\$	22,181
b. First Prior Year		(5,303)
c. Second Prior Year		(361)
d. Third Prior Year		386
e. Fourth Prior Year		4,737
f. Total Recognized Investment Gain	\$	21,640
(7) Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	600,670



Schedule B – Development of Actuarial Value of Assets

**VIRGINIA LAW OFFICERS**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

(1) Actuarial Value Beginning of Year	\$	1,546,528
(2) Market Value End of Year	\$	1,868,924
(3) Market Value Beginning of Year	\$	1,500,469
(4) Cash Flow		
a. Contributions	\$	94,017
b. Benefit Payments		(129,836)
c. Administrative Expenses		(943)
d. Miscellaneous revenue and expenses		-
e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(36,762)
(5) Investment Income		
a. Market total: (2) – (3) – (4)e	\$	405,217
b. Assumed Rate		6.75%
c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	100,041
d. Amount for Phased-in Recognition: (5)a – (5)c	\$	305,176
(6) Phased-In Recognition of Investment Income		
a. Current Year: 0.20 x (5)d	\$	61,035
b. First Prior Year		(14,318)
c. Second Prior Year		(1,008)
d. Third Prior Year		957
e. Fourth Prior Year		12,329
f. Total Recognized Investment Gain	\$	58,995
(7) Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	1,668,802



*Schedule B – Development of Actuarial Value of Assets*

**POLITICAL SUBDIVISIONS**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

(1) Actuarial Value Beginning of Year	\$	21,869,927
(2) Market Value End of Year	\$	26,558,350
(3) Market Value Beginning of Year	\$	21,234,091
(4) Cash Flow		
a. Contributions	\$	838,551
b. Benefit Payments		(1,279,534)
c. Administrative Expenses		(14,412)
d. Miscellaneous revenue and expenses		327
e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(455,068)
(5) Investment Income		
a. Market total: (2) – (3) – (4)e	\$	5,779,327
b. Assumed Rate		6.75%
c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	1,417,943
d. Amount for Phased-in Recognition: (5)a – (5)c	\$	4,361,384
(6) Phased-In Recognition of Investment Income		
a. Current Year: 0.20 x (5)d	\$	872,277
b. First Prior Year		(203,088)
c. Second Prior Year		(12,361)
d. Third Prior Year		16,335
e. Fourth Prior Year		180,917
f. Total Recognized Investment Gain	\$	854,080
(7) Adjustment to Beginning of Year Market Value	\$	0
(8) Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f + (7)]	\$	23,686,882



Schedule C – Summary of Changes in Net Assets

STATE EMPLOYEES  
For the Year Ending June 30, 2021  
(\$ in thousands)

<u>Additions for the Year</u>	
Contributions:	
Members	\$ 207,065
Members (paid by employer)	-
Employers	<u>609,778</u>
Total	\$ 816,843
Miscellaneous Revenue	(736)
Net Investment Income	<u>5,055,162</u>
TOTAL	\$ 5,871,269
<u>Deductions for the Year</u>	
Benefit Payments	\$ 1,486,951
Refunds	29,065
Transfers	-
Administrative Expenses	<u>12,904</u>
TOTAL	\$ 1,528,920
<u>Excess of Additions Over Deductions</u>	<u>\$ 4,342,349</u>
<u>Reconciliation of Asset Balances</u>	
Market Value of Assets as of 6/30/2020	\$ 18,770,068
Adjustment to Beginning of Year Market Value	-
Excess of Additions over Deductions	<u>4,342,349</u>
Market Value of Assets as of 6/30/2021*	<u>\$ 23,112,417</u>

\*The Market Value of Assets shown above is used in the determination of the Actuarial Value of Assets (Schedule B).



Schedule C – Summary of Changes in Net Assets

**TEACHERS**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

<u>Additions for the Year</u>	
Contributions:	
Members	\$ 419,415
Members (paid by employer)	-
Employers	<u>1,477,479</u>
Total	\$ 1,896,894
Miscellaneous Revenue	667
Net Investment Income	<u>9,887,248</u>
TOTAL	\$ 11,784,809
<u>Deductions for the Year</u>	
Benefit Payments	\$ 2,553,153
Refunds	38,464
Transfers	-
Administrative Expenses	<u>24,543</u>
TOTAL	<u>\$ 2,616,160</u>
<u>Excess of Additions Over Deductions</u>	<u>\$ 9,168,649</u>
<u>Reconciliation of Asset Balances</u>	
Market Value of Assets as of 6/30/2020	\$ 36,449,229
Excess of Additions over Deductions	<u>9,168,649</u>
Market Value of Assets as of 6/30/2021*	<u>\$ 45,617,878</u>

\*The Market Value of Assets shown above is used in the determination of the Actuarial Value of Assets (Schedule B).



Schedule C – Summary of Changes in Net Assets

**STATE POLICE**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

<u>Additions for the Year</u>	
Contributions:	
Members	\$ 6,489
Members (paid by employer)	-
Employers	<u>33,788</u>
Total	\$ 40,277
Miscellaneous Revenue	-
Net Investment Income	<u>229,139</u>
TOTAL	\$ 269,416
<u>Deductions for the Year</u>	
Benefit Payments	\$ 73,227
Refunds	271
Transfers	-
Administrative Expenses	<u>532</u>
TOTAL	<u>\$ 74,030</u>
<u>Excess of Additions Over Deductions</u>	<u>\$ 195,386</u>
<u>Reconciliation of Asset Balances</u>	
Market Value of Assets as of 6/30/2020	\$ 854,762
Excess of Additions over Deductions	<u>195,386</u>
Market Value of Assets as of 6/30/2021*	<u>\$ 1,050,148</u>

\*The Market Value of Assets shown above is used in the determination of the Actuarial Value of Assets (Schedule B).



Schedule C – Summary of Changes in Net Assets

**JUDICIAL**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

<u>Additions for the Year</u>	
Contributions:	
Members	\$ 1,868
Members (paid by employer)	-
Employers	<u>22,856</u>
Total	\$ 24,724
Miscellaneous Revenue	-
Net Investment Income	<u>147,201</u>
TOTAL	\$ 171,925
<u>Deductions for the Year</u>	
Benefit Payments	\$ 47,750
Refunds	135
Transfers	-
Administrative Expenses	<u>343</u>
TOTAL	\$ 48,228
<u>Excess of Additions Over Deductions</u>	<u>\$ 123,697</u>
<u>Reconciliation of Asset Balances</u>	
Market Value of Assets as of 6/30/2020	\$ 549,455
Excess of Additions over Deductions	<u>123,697</u>
Market Value of Assets as of 6/30/2021*	<u>\$ 673,152</u>

\*The Market Value of Assets shown above is used in the determination of the Actuarial Value of Assets (Schedule B).



Schedule C – Summary of Changes in Net Assets

**VIRGINIA LAW OFFICERS**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

<u>Additions for the Year</u>	
Contributions:	
Members	\$ 17,602
Members (paid by employer)	-
Employers	<u>76,415</u>
Total	\$ 94,017
Miscellaneous Revenue	-
Net Investment Income	<u>405,217</u>
TOTAL	\$ 499,234
<u>Deductions for the Year</u>	
Benefit Payments	\$ 124,045
Refunds	5,791
Transfers	-
Administrative Expenses	<u>943</u>
TOTAL	<u>\$ 130,779</u>
<u>Excess of Additions Over Deductions</u>	<u>\$ 368,455</u>
<u>Reconciliation of Asset Balances</u>	
Market Value of Assets as of 6/30/2020	\$ 1,500,469
Excess of Additions over Deductions	<u>368,455</u>
Market Value of Assets as of 6/30/2021*	<u>\$ 1,868,924</u>

\*The Market Value of Assets shown above is used in the determination of the Actuarial Value of Assets (Schedule B).





Schedule C – Summary of Changes in Net Assets

**POLITICAL SUBDIVISIONS**  
**For the Year Ending June 30, 2021**  
**(\$ in thousands)**

<u>Additions for the Year</u>		
Contributions:		
Members	\$	258,562
Members (paid by employer)		-
Employers		579,989
		<hr/>
Total	\$	838,551
Miscellaneous Revenue		327
Net Investment Income		5,779,327
		<hr/>
TOTAL	\$	6,618,205
<u>Deductions for the Year</u>		
Benefit Payments	\$	1,237,074
Refunds		42,460
Transfers		-
Administrative Expenses		14,412
		<hr/>
TOTAL	\$	1,293,946
<u>Excess of Additions Over Deductions</u>	\$	<u>5,324,259</u>
<u>Reconciliation of Asset Balances</u>		
Market Value of Assets as of 6/30/2020	\$	21,234,091
Adjustment to Beginning of Year Market Value		-
Excess of Additions over Deductions		5,324,259
		<hr/>
Market Value of Assets as of 6/30/2021*	\$	<u>26,558,350</u>

\*The Market Value of Assets shown above includes Political Subdivisions with no active members and is used in the determination of the Actuarial Value of Assets (Schedule B).



Schedule D – Amortization of Unfunded Accrued Liability

**STATE EMPLOYEES**  
**As of June 30, 2021**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2020</u>	<u>BOY 2020/2021 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2021</u>	<u>BOY 2021/2022 Amortization Payment</u>	<u>Years Remaining June 30, 2021</u>
2013 Original Unfunded	\$7,117,727,223	\$7,495,073,301	\$469,607,550	\$7,499,684,689	\$483,695,777	22 years
2014 Experience (Gain) / Loss	(\$414,716,278)	(\$383,507,299)	(\$34,205,174)	(\$372,880,018)	(\$35,231,329)	13 years
2015 Experience (Gain) / Loss	(\$637,505,432)	(\$602,730,455)	(\$51,000,603)	(\$588,971,617)	(\$52,530,621)	14 years
2016 Experience (Gain) / Loss	(\$87,589,562)	(\$84,299,589)	(\$6,796,738)	(\$82,734,293)	(\$7,000,640)	15 years
2017 Assumption Change	\$62,300,692	\$60,806,722	\$4,689,254	\$59,905,397	\$4,829,932	16 years
2017 Experience (Gain) / Loss	(\$570,456,389)	(\$556,776,846)	(\$42,937,164)	(\$548,523,861)	(\$44,225,279)	16 years
2018 Experience (Gain) / Loss	(\$104,169,714)	(\$102,761,841)	(\$7,605,383)	(\$101,579,519)	(\$7,833,545)	17 years
2019 Experience (Gain) / Loss	\$15,231,288	\$15,141,452	\$1,078,676	\$15,012,013	\$1,111,036	18 years
2019 Assumption Change	\$671,335,725	\$667,376,101	\$47,543,821	\$661,670,959	\$48,970,136	18 years
2020 Experience (Gain) / Loss	(\$90,660,484)	(\$90,660,484)	(\$6,233,546)	(\$90,125,756)	(\$6,420,552)	19 years
2021 Experience (Gain) / Loss	(\$740,623,129)			(\$740,623,129)	(\$50,923,046)	20 years
2021 Assumption Change	\$401,835,129			\$401,835,129	\$27,628,990	20 years
<b>Total</b>		<b>\$6,417,661,062</b>	<b>\$374,140,693</b>	<b>\$6,112,669,994</b>	<b>\$362,070,859</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2021	\$6,112,669,994
June 30, 2022	\$6,138,764,577
June 30, 2023	\$6,155,025,224
June 30, 2024	\$6,160,440,286
June 30, 2043	\$0



Schedule D – Amortization of Unfunded Accrued Liability

**TEACHERS**  
**As of June 30, 2021**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2020</u>	<u>BOY 2020/2021 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2021</u>	<u>BOY 2021/2022 Amortization Payment</u>	<u>Years Remaining June 30, 2021</u>
2013 Original Unfunded	\$14,493,629,234	\$15,262,008,519	\$956,248,744	\$15,271,398,560	\$984,936,206	22 years
2014 Experience (Gain) / Loss	(\$958,176,017)	(\$886,069,625)	(\$79,028,914)	(\$861,515,959)	(\$81,399,782)	13 years
2015 Experience (Gain) / Loss	(\$1,043,509,874)	(\$986,587,955)	(\$83,481,065)	(\$964,066,605)	(\$85,985,497)	14 years
2016 Experience (Gain) / Loss	(\$411,540,187)	(\$396,082,225)	(\$31,934,521)	(\$388,727,674)	(\$32,892,557)	15 years
2017 Assumption Change	\$104,287,885	\$101,787,062	\$7,849,550	\$100,278,294	\$8,085,037	16 years
2017 Experience (Gain) / Loss	(\$685,386,348)	(\$668,950,786)	(\$51,587,723)	(\$659,035,070)	(\$53,135,354)	16 years
2018 Experience (Gain) / Loss	(\$554,684,143)	(\$547,187,482)	(\$40,497,237)	(\$540,891,837)	(\$41,712,154)	17 years
2019 Experience (Gain) / Loss	(\$304,039,579)	(\$302,246,315)	(\$21,532,004)	(\$299,662,527)	(\$22,177,964)	18 years
2019 Assumption Change	\$1,469,767,609	\$1,461,098,731	\$104,088,560	\$1,448,608,358	\$107,211,216	18 years
2020 Experience (Gain) / Loss	\$179,548,117	\$179,548,117	\$12,345,195	\$178,489,119	\$12,715,551	19 years
2021 Experience (Gain) / Loss	(\$2,139,250,000)			(\$2,139,250,000)	(\$147,088,474)	20 years
2021 Assumption Change	\$876,189,832			\$876,189,832	\$60,244,210	20 years
2011 10 Yr Payback of Contribution Deficit	\$741,432,106	\$61,344,275	\$61,344,275	\$0	\$0	0 years
<b>Total</b>		<b>\$13,278,662,316</b>	<b>\$833,814,860</b>	<b>\$12,021,814,491</b>	<b>\$708,800,438</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2021	\$12,021,814,491
June 30, 2022	\$12,076,642,502
June 30, 2023	\$12,112,472,069
June 30, 2024	\$12,127,339,818
June 30, 2043	\$0



Schedule D – Amortization of Unfunded Accrued Liability

**STATE POLICE**  
**As of June 30, 2021**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2020</u>	<u>BOY 2020/2021 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2021</u>	<u>BOY 2021/2022 Amortization Payment</u>	<u>Years Remaining June 30, 2021</u>
2013 Original Unfunded	\$385,000,723	\$405,411,525	\$25,401,261	\$405,660,957	\$26,163,299	22 years
2014 Experience (Gain) / Loss	(\$25,215,304)	(\$23,317,757)	(\$2,079,720)	(\$22,671,604)	(\$2,142,112)	13 years
2015 Experience (Gain) / Loss	(\$30,844,770)	(\$29,162,234)	(\$2,467,590)	(\$28,496,532)	(\$2,541,617)	14 years
2016 Experience (Gain) / Loss	(\$3,942,276)	(\$3,794,199)	(\$305,911)	(\$3,723,747)	(\$315,088)	15 years
2017 Assumption Change	(\$63,376,957)	(\$61,857,178)	(\$4,770,263)	(\$60,940,282)	(\$4,913,371)	16 years
2017 Experience (Gain) / Loss	(\$22,588,135)	(\$22,046,472)	(\$1,700,166)	(\$21,719,682)	(\$1,751,171)	16 years
2018 Experience (Gain) / Loss	\$23,290,790	\$22,976,011	\$1,700,450	\$22,711,661	\$1,751,463	17 years
2019 Experience (Gain) / Loss	\$5,168,037	\$5,137,555	\$365,999	\$5,093,636	\$376,979	18 years
2019 Assumption Change	\$32,015,645	\$31,826,812	\$2,267,340	\$31,554,736	\$2,335,360	18 years
2020 Experience (Gain) / Loss	\$415,655	\$415,655	\$28,579	\$413,204	\$29,437	19 years
2021 Experience (Gain) / Loss	\$2,351,016			\$2,351,016	\$161,649	20 years
2021 Assumption Change	\$59,080,606			\$59,080,606	\$4,062,207	20 years
<b>Total</b>		<b>\$325,589,718</b>	<b>\$18,439,979</b>	<b>\$389,313,969</b>	<b>\$23,217,035</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2021	\$389,313,969
June 30, 2022	\$390,808,477
June 30, 2023	\$391,660,340
June 30, 2024	\$391,803,871
June 30, 2043	\$0



Schedule D – Amortization of Unfunded Accrued Liability

**JUDICIAL**  
As of June 30, 2021

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2020</u>	<u>BOY 2020/2021 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2021</u>	<u>BOY 2021/2022 Amortization Payment</u>	<u>Years Remaining June 30, 2021</u>
2013 Original Unfunded	\$209,625,821	\$220,739,128	\$13,830,520	\$220,874,939	\$14,245,436	22 years
2014 Experience (Gain) / Loss	(\$21,000,605)	(\$19,420,231)	(\$1,732,098)	(\$18,882,082)	(\$1,784,061)	13 years
2015 Experience (Gain) / Loss	(\$44,957,373)	(\$42,505,014)	(\$3,596,602)	(\$41,534,730)	(\$3,704,500)	14 years
2016 Experience (Gain) / Loss	(\$19,134,811)	(\$18,416,084)	(\$1,484,815)	(\$18,074,130)	(\$1,529,359)	15 years
2017 Assumption Change	\$19,588,792	\$19,119,052	\$1,474,411	\$18,835,654	\$1,518,643	16 years
2017 Experience (Gain) / Loss	(\$27,709,090)	(\$27,044,627)	(\$2,085,610)	(\$26,643,751)	(\$2,148,179)	16 years
2018 Experience (Gain) / Loss	(\$18,377,310)	(\$18,128,936)	(\$1,341,719)	(\$17,920,354)	(\$1,381,970)	17 years
2019 Experience (Gain) / Loss	(\$9,407,887)	(\$9,352,398)	(\$666,264)	(\$9,272,448)	(\$686,252)	18 years
2019 Assumption Change	\$13,983,016	\$13,900,542	\$990,274	\$13,781,711	\$1,019,982	18 years
2020 Experience (Gain) / Loss	(\$7,258,262)	(\$7,258,262)	(\$499,057)	(\$7,215,451)	(\$514,028)	19 years
2021 Experience (Gain) / Loss	(\$32,650,663)			(\$32,650,663)	(\$2,244,963)	20 years
2021 Assumption Change	\$51,438,904			\$51,438,904	\$3,536,786	20 years
<b>Total</b>		<b>\$111,633,170</b>	<b>\$4,889,040</b>	<b>\$132,737,599</b>	<b>\$6,327,535</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2021	\$132,737,599
June 30, 2022	\$134,942,743
June 30, 2023	\$137,094,097
June 30, 2024	\$139,181,948
June 30, 2043	\$0



Schedule D – Amortization of Unfunded Accrued Liability

**VIRGINIA LAW OFFICERS**  
As of June 30, 2021

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2020</u>	<u>BOY 2020/2021 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2021</u>	<u>BOY 2021/2022 Amortization Payment</u>	<u>Years Remaining June 30, 2021</u>
2013 Original Unfunded	\$759,539,883	\$799,806,864	\$50,112,297	\$800,298,950	\$51,615,666	22 years
2014 Experience (Gain) / Loss	(\$27,744,710)	(\$25,656,816)	(\$2,288,342)	(\$24,945,846)	(\$2,356,992)	13 years
2015 Experience (Gain) / Loss	(\$16,540,081)	(\$15,637,844)	(\$1,323,211)	(\$15,280,871)	(\$1,362,907)	14 years
2016 Experience (Gain) / Loss	\$9,695,693	\$9,331,511	\$752,362	\$9,158,242	\$774,933	15 years
2017 Assumption Change	(\$59,590,715)	(\$58,161,731)	(\$4,485,279)	(\$57,299,613)	(\$4,619,838)	16 years
2017 Experience (Gain) / Loss	(\$46,004,687)	(\$44,901,495)	(\$3,462,685)	(\$44,235,930)	(\$3,566,566)	16 years
2018 Experience (Gain) / Loss	(\$12,006,355)	(\$11,844,088)	(\$876,579)	(\$11,707,816)	(\$902,876)	17 years
2019 Experience (Gain) / Loss	\$14,301,783	\$14,217,429	\$1,012,849	\$14,095,889	\$1,043,234	18 years
2019 Assumption Change	\$62,981,588	\$62,610,114	\$4,460,340	\$62,074,884	\$4,594,150	18 years
2020 Experience (Gain) / Loss	(\$17,739,385)	(\$17,739,385)	(\$1,219,707)	(\$17,634,756)	(\$1,256,299)	19 years
2021 Experience (Gain) / Loss	(\$44,102,557)			(\$44,102,557)	(\$3,032,361)	20 years
2021 Assumption Change	\$67,930,918			\$67,930,918	\$4,670,728	20 years
<b>Total</b>		<b>\$712,024,559</b>	<b>\$42,682,045</b>	<b>\$738,351,494</b>	<b>\$45,600,872</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2021	\$738,351,494
June 30, 2022	\$739,511,289
June 30, 2023	\$739,289,001
June 30, 2024	\$737,547,530
June 30, 2043	\$0



## Schedule E – Outline of Actuarial Assumptions and Methods

### **Assumptions and Methods which apply to all VRS Plans**

The assumptions and methods used in the valuation are based on the results of an actuarial experience study for the period from July 1, 2016 through June 30, 2020 adopted by the Board of Trustees at its April 20, 2021 meeting, as well as the investment rate of return of 6.75% adopted by the Board of Trustees at its October 10, 2019 meeting. These assumptions comply with Actuarial Standard of Practice (ASOP) No. 27, Selection of Economic Assumptions for Measuring Pension Obligations and ASOP No. 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations.

**Investment Return Rate:** 6.75% per annum, compounded annually, net of investment expenses.

**Inflation Assumption:** 2.50% per year.

**Actuarial Cost Method:** Entry age normal cost method. Actuarial gains and losses are reflected in the unfunded actuarial accrued liability. See Schedule F for a detailed explanation.

**Amortization Method:** The legacy unfunded actuarial accrued liability less the deferred contribution as of June 30, 2013 is amortized over a closed 30-year period from June 30, 2013. The amortization period of the unfunded less the deferred contribution, will decrease by one each year until reaching 0 years. The deferred contribution, as defined under the 2011 Appropriations Act, Item 469(1)(6), has been paid off for all plans as of June 30, 2021. The actuarial gains and losses and other changes in the unfunded due to benefit and actuarial assumption and method changes for each valuation subsequent to the June 30, 2013 valuation will be amortized over a closed 20-year period. See the Amortization Schedules for more detail. The amortization of the unfunded accrued liability assumes that payroll will increase by 3% annually and the amortization period will decrease by one year until reaching 0 years.

The amortization payment includes an adjustment of 1.018041 to account for the passage of time from the valuation date to the date the contribution is made.

**Payroll Growth Rate:** 3.00% per annum.

**Asset Valuation Method:** The method of valuing assets is intended to recognize a “smoothed” market value of assets. Under this method, the difference between actual return on market value from investment experience and the expected return on market value is recognized over a five-year period. The resulting actuarial value of assets cannot be less than 80% or more than 120% of the market value of assets.



## Schedule E – Outline of Actuarial Assumptions and Methods

<b>Cost-of-living Increase:</b>	2.50% per year compounded annually for Plan 1 members receiving benefits or vested as of January 1, 2013 and 2.25% compounded annually for all other members. The temporary supplement for SPORS and VaLORS members is assumed to be adjusted biennially based on increases of 2.50% per annum compounded annually.
<b>Percent Electing a Deferred Termination Benefit:</b>	Terminating members are assumed to elect a return of contributions or a deferred annuity, whichever is most valuable benefit at the time of termination. Termination benefits are assumed to commence at normal retirement age.
<b>Assumed Payment Form:</b>	Modified cash refund annuity; in which the total benefit received by a member and his or her estate cannot be less than the total contributions made by the member while he or she was an active participant plus interest. For members in pay status, the modified cash refund was estimated to be in effect for two years after retirement for Judicial members and three years for all others.
<b>Marriage Assumption:</b>	100% of active employees are assumed to be married, with males two years older than females.
<b>Service-Related Disability:</b>	The service-related disability benefits do not include an adjustment for Social Security or Worker's Compensation benefits.
<b>Hazardous Duty Service:</b>	The valuations of SPORS and VaLORS assume that all VRS service is hazardous duty service for purposes of determining eligibility for the temporary supplement.
<b>Administrative Expenses:</b>	The employer contribution rates include a rate for anticipated non-investment expenses based on actual prior year experience.





Schedule E – State Employees’ Actuarial Assumptions and Methods

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**STATE EMPLOYEES**

**Plan Specific Assumptions and Methods**

**MORTALITY RATES:**

Pre-Retirement:

Pub-2010 Amount Weighted General Employee Rates projected generationally;  
females set forward 2 years

Post-Retirement:

Pub-2010 Amount Weighted General Healthy Retiree Rates projected  
generationally; 110% of rates for females

Post-Disablement:

Pub-2010 Amount Weighted General Disabled Rates projected generationally;  
males and females set forward 3 years

Beneficiaries and Survivors:

Pub-2010 Amount Weighted General Contingent Annuitant Rates projected  
generationally; 110% of rates for males and females

Mortality Improvement:

Rates projected generationally with Modified MP-2020 Improvement Scale that is  
75% of the MP-2020 rates



**Schedule E – State Employees’ Actuarial Assumptions and Methods**

State Mortality Base Rates								
Age	Male				Female			
	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor
20	0.00037	0.00037	0.00316	0.00041	0.00011	0.00014	0.00176	0.00014
25	0.00028	0.00028	0.00321	0.00031	0.00011	0.00010	0.00215	0.00010
30	0.00036	0.00036	0.00411	0.00040	0.00018	0.00017	0.00336	0.00017
35	0.00047	0.00047	0.00555	0.00052	0.00028	0.00025	0.00524	0.00025
40	0.00066	0.00066	0.00834	0.00073	0.00043	0.00040	0.00825	0.00040
45	0.00098	0.00098	0.01342	0.00604	0.00066	0.00062	0.01267	0.00288
50	0.00149	0.00298	0.01921	0.00771	0.00097	0.00244	0.01640	0.00352
55	0.00219	0.00431	0.02355	0.00906	0.00144	0.00315	0.01874	0.00491
60	0.00319	0.00615	0.02785	0.01113	0.00222	0.00422	0.02110	0.00684
65	0.00468	0.00913	0.03524	0.01522	0.00362	0.00674	0.02569	0.00989
70	0.00703	0.01526	0.04599	0.02342	0.00598	0.01169	0.03464	0.01488
75	0.01096	0.02671	0.06347	0.03720	0.00986	0.02071	0.05075	0.02366
80	0.01730	0.04774	0.09259	0.05896	0.04276	0.03696	0.07811	0.03930
85		0.08591	0.13603	0.09617		0.06826	0.11878	0.06948
90		0.14672	0.20588	0.15860		0.12636	0.16740	0.12462

25% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated as projected with a modified MP-2020 Improvement Scale.



**Schedule E – State Employees’ Actuarial Assumptions and Methods**

**RETIREMENT RATES:** The following rates of retirement are assumed for members eligible to retire from Plan 1.

State Employees Retirement Rates, Plan 1 Male							
Age	Years of Service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
50	0.0000	0.0000	0.0000	0.0325	0.0325	0.1250	0.1250
51	0.0000	0.0000	0.0000	0.0325	0.0300	0.0800	0.0900
52	0.0000	0.0000	0.0000	0.0325	0.0300	0.0800	0.0900
53	0.0000	0.0000	0.0000	0.0325	0.0300	0.0800	0.0900
54	0.0000	0.0000	0.0000	0.0325	0.0300	0.0800	0.0900
55	0.0000	0.0450	0.0450	0.0450	0.0350	0.0800	0.0900
56	0.0000	0.0450	0.0400	0.0400	0.0400	0.0800	0.0900
57	0.0000	0.0450	0.0400	0.0400	0.0400	0.0800	0.0900
58	0.0000	0.0450	0.0400	0.0400	0.0400	0.1000	0.0900
59	0.0000	0.0450	0.0400	0.0400	0.0400	0.1000	0.0900
60	0.0000	0.0450	0.0500	0.0500	0.0500	0.1150	0.0900
61	0.0000	0.1500	0.0750	0.0750	0.0750	0.1700	0.1500
62	0.0000	0.1500	0.1000	0.1000	0.1000	0.1700	0.2000
63	0.0000	0.1500	0.1000	0.1000	0.1000	0.1700	0.1750
64	0.0000	0.1500	0.1350	0.1350	0.1350	0.1700	0.1750
65	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
66	0.0000	0.2750	0.2500	0.2500	0.2500	0.2500	0.2500
67	0.0000	0.2750	0.2200	0.2200	0.2200	0.2200	0.2200
68	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
69	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
70	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
71	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
72	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
73	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
74	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
75	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
76	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
77	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
78	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
79	0.0000	0.2000	0.2200	0.2200	0.2200	0.2200	0.2200
>=80	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000



**Schedule E – State Employees’ Actuarial Assumptions and Methods**

State Employees Retirement Rates, Plan 1 Female							
Age	Years of Service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
50	0.0000	0.0000	0.0000	0.0400	0.0400	0.0750	0.0750
51	0.0000	0.0000	0.0000	0.0400	0.0300	0.0750	0.0600
52	0.0000	0.0000	0.0000	0.0400	0.0350	0.0750	0.0600
53	0.0000	0.0000	0.0000	0.0500	0.0350	0.0750	0.0800
54	0.0000	0.0000	0.0000	0.0500	0.0350	0.0750	0.0800
55	0.0000	0.0500	0.0500	0.0500	0.0400	0.0750	0.0800
56	0.0000	0.0500	0.0400	0.0400	0.0400	0.0750	0.0800
57	0.0000	0.0500	0.0400	0.0400	0.0400	0.1000	0.0900
58	0.0000	0.0500	0.0450	0.0450	0.0450	0.1000	0.0900
59	0.0000	0.0500	0.0500	0.0500	0.0500	0.1200	0.0900
60	0.0000	0.0500	0.0550	0.0550	0.0550	0.1200	0.1250
61	0.0000	0.0750	0.0800	0.0800	0.0800	0.1200	0.1600
62	0.0000	0.1000	0.1200	0.1200	0.1200	0.2250	0.2000
63	0.0000	0.1750	0.1200	0.1200	0.1200	0.2250	0.1750
64	0.0000	0.1750	0.1500	0.1500	0.1500	0.2250	0.1750
65	0.0000	0.2750	0.2750	0.2750	0.2750	0.2750	0.3000
66	0.0000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
67	0.0000	0.3000	0.2500	0.2500	0.2500	0.2500	0.2500
68	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
69	0.0000	0.2500	0.2700	0.2700	0.2700	0.2700	0.2700
70	0.0000	0.2500	0.2700	0.2700	0.2700	0.2700	0.2700
71	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
72	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
73	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
74	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
75	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
76	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
77	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
78	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
79	0.0000	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500
>=80	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000



**Schedule E – State Employees’ Actuarial Assumptions and Methods**

**RETIREMENT RATES:** The following rates of retirement are assumed for members eligible to retire from Plan 2 and the Hybrid Plan.

State Employees Retirement Rates, Plan 2 and Hybrid Male																			
Age	Years of Service																		
	0-4	5	6-24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
60	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
61	0.000	0.080	0.075	0.075	0.075	0.075	0.080	0.080	0.080	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
62	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
63	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
64	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
65	0.000	0.200	0.200	0.200	0.200	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
67	0.000	0.230	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
68	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
69	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
70	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
71	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
72	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
73	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
74	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
75	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
76	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
77	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
78	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
79	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
>=80	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule E – State Employees’ Actuarial Assumptions and Methods

State Employees Retirement Rates, Plan 2 and Hybrid Female																			
Age	Years of Service																		
	0-4	5	6-24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
60	0.000	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
61	0.000	0.080	0.075	0.075	0.075	0.075	0.080	0.080	0.080	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
62	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
63	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
64	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
65	0.000	0.200	0.200	0.200	0.200	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
67	0.000	0.230	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
68	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
69	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
70	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
71	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
72	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
73	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
74	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
75	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
76	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
77	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
78	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
79	0.000	0.250	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
>=80	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule E – State Employees’ Actuarial Assumptions and Methods

**DISABILITY RATES:** As shown below for selected ages. 25% of disability cases are assumed to be service related.

State Employees Disability Rates		
Age	Male	Female
20	0.00039	0.00033
25	0.00072	0.00100
30	0.00091	0.00211
35	0.00129	0.00281
40	0.00212	0.00354
45	0.00343	0.00474
50	0.00497	0.00629
55	0.00629	0.00742
60	0.00690	0.00735
65	0.00657	0.00653
70	0.00572	0.00841



Schedule E – State Employees’ Actuarial Assumptions and Methods

**TERMINATION RATES:** The following are sample withdrawal rates based on age and years of service (for causes other than death, disability, or retirement).

State Termination Rates, Male											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.27455	0.24436	0.21876	0.19618	0.17376	0.15141	0.13019	0.11442	0.10694	0.11166	0.13006
25	0.23974	0.21579	0.19409	0.17424	0.15524	0.13693	0.11975	0.10595	0.09746	0.09732	0.10701
30	0.19848	0.17836	0.15985	0.14343	0.12952	0.11720	0.10578	0.09487	0.08505	0.07808	0.07539
35	0.17716	0.15218	0.13247	0.11805	0.10829	0.10087	0.09383	0.08541	0.07535	0.06447	0.05388
40	0.16592	0.13267	0.10974	0.09619	0.08963	0.08644	0.08292	0.07677	0.06737	0.05473	0.03929
45	0.15975	0.11918	0.09302	0.07949	0.07467	0.07461	0.07339	0.06905	0.06126	0.04945	0.03331
50	0.15528	0.11158	0.08401	0.07030	0.06578	0.06661	0.06592	0.06272	0.05733	0.04934	0.03819
55	0.15197	0.11087	0.08483	0.07159	0.06658	0.06381	0.06149	0.05872	0.05613	0.05509	0.05439
60	0.15091	0.11838	0.09735	0.08612	0.08094	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.15304	0.13450	0.12193	0.11472	0.11037	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.16014	0.16414	0.16565	0.16590	0.16406	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

State Termination Rates, Female											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.31051	0.30337	0.28078	0.24487	0.20381	0.16715	0.14191	0.11957	0.10836	0.11872	0.15981
25	0.27376	0.26249	0.24118	0.21199	0.18029	0.15160	0.13004	0.11112	0.09997	0.10375	0.12876
30	0.23050	0.21033	0.18887	0.16746	0.14755	0.12956	0.11392	0.10015	0.08933	0.08403	0.08671
35	0.20766	0.17777	0.15365	0.13514	0.12123	0.10996	0.09994	0.09070	0.08104	0.07066	0.05980
40	0.19406	0.15556	0.12786	0.10975	0.09881	0.09213	0.08715	0.08194	0.07420	0.06178	0.04364
45	0.18340	0.13974	0.10951	0.09110	0.08142	0.07776	0.07634	0.07404	0.06888	0.05803	0.04010
50	0.17198	0.12790	0.09781	0.08001	0.07116	0.06882	0.06860	0.06763	0.06550	0.06030	0.05125
55	0.16001	0.12044	0.09383	0.07856	0.07120	0.06731	0.06491	0.06383	0.06463	0.06942	0.07765
60	0.14937	0.11902	0.09937	0.08896	0.08486	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.14142	0.12453	0.11513	0.11187	0.11326	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.13651	0.14019	0.14662	0.15441	0.16495	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000





Schedule E – State Employees’ Actuarial Assumptions and Methods

**SALARY INCREASE RATES:** The following total salary increase rates are used. The total salary increase rate consists of an inflation rate of 2.50%, a productivity component of 1.00%, and a variable merit component that is dependent on years of service.

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1	5.35%
2	5.35
3	4.75
4	4.45
5	4.45
6	4.45
7	4.35
8	4.25
9	4.00
10	4.00
11-19	3.65
20 or more	3.50

**DISABILITY ELECTION:** All active members hired on or after January 1, 1999 will enter the Virginia Sickness and Disability Program (VSDP) and will not be eligible to receive non-VSDP disability benefits. For members hired before January 1, 1999 we measure the liabilities based upon the member’s actual election contained in the valuation data.

**EMPLOYER CONTRIBUTION TO DEFINED CONTRIBUTION HYBRID PLAN:** The valuation assumes an average employer defined contribution rate for members in the Hybrid Plan. This is reported by VRS for each valuation.



Schedule E – Teachers’ Actuarial Assumptions and Methods

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**TEACHERS**

**Plan Specific Assumptions and Methods**

**MORTALITY RATES:**

Pre-Retirement:

Pub-2010 Amount Weighted Teachers Employee Rates projected generationally;  
110% of rates for males

Post-Retirement:

Pub-2010 Amount Weighted Teachers Healthy Retiree Rates projected  
generationally; males set forward 1 year; 105% of rates for females

Post-Disablement:

Pub-2010 Amount Weighted Teachers Disabled Rates projected generationally;  
110% of rates for males and females

Beneficiaries and Survivors:

Pub-2010 Amount Weighted Teachers Contingent Annuitant Rates projected  
generationally

Mortality Improvement:

Rates projected generationally with Modified MP-2020 Improvement Scale that is  
75% of the MP-2020 rates



**Schedule E – Teachers’ Actuarial Assumptions and Methods**

Teachers Mortality Base Rates								
Age	Male				Female			
	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor
20	0.00037	0.00030	0.00453	0.00034	0.00013	0.00014	0.00256	0.00013
25	0.00018	0.00017	0.00306	0.00016	0.00009	0.00010	0.00180	0.00009
30	0.00024	0.00024	0.00389	0.00022	0.00014	0.00015	0.00283	0.00014
35	0.00033	0.00032	0.00504	0.00030	0.00020	0.00021	0.00441	0.00020
40	0.00046	0.00046	0.00710	0.00042	0.00031	0.00033	0.00692	0.00031
45	0.00074	0.00074	0.01108	0.00549	0.00048	0.00050	0.01084	0.00262
50	0.00122	0.00122	0.01766	0.00701	0.00073	0.00077	0.01631	0.00320
55	0.00189	0.00245	0.02325	0.00824	0.00107	0.00203	0.01916	0.00446
60	0.00290	0.00393	0.02753	0.01012	0.00161	0.00301	0.02152	0.00622
65	0.00479	0.00662	0.03348	0.01384	0.00270	0.00468	0.02482	0.00899
70	0.00780	0.01214	0.04291	0.02129	0.00485	0.00809	0.03148	0.01353
75	0.01185	0.02312	0.05711	0.03382	0.00921	0.01534	0.04403	0.02151
80	0.02343	0.04363	0.08083	0.05360	0.01826	0.02959	0.06608	0.03573
85		0.08198	0.11897	0.08743		0.05655	0.10264	0.06316
90		0.14859	0.17878	0.14418		0.10594	0.15032	0.11329

5% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated as projected with a modified MP-2020 Improvement Scale.



*Schedule E – Teachers’ Actuarial Assumptions and Methods*

**RETIREMENT RATES:** The following rates of retirement are assumed for members eligible to retire from Plan 1.

Teachers Employees Retirement Rates, Plan 1 Male							
Age	Years of Service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.025	0.025	0.150	0.150
51	0.000	0.000	0.000	0.070	0.035	0.150	0.100
52	0.000	0.000	0.000	0.070	0.035	0.150	0.100
53	0.000	0.000	0.000	0.040	0.035	0.150	0.100
54	0.000	0.000	0.000	0.040	0.040	0.150	0.100
55	0.000	0.070	0.070	0.070	0.050	0.225	0.150
56	0.000	0.070	0.050	0.050	0.050	0.225	0.150
57	0.000	0.070	0.050	0.050	0.050	0.225	0.150
58	0.000	0.070	0.050	0.050	0.050	0.225	0.150
59	0.000	0.100	0.070	0.070	0.070	0.225	0.150
60	0.000	0.100	0.075	0.075	0.075	0.225	0.170
61	0.000	0.110	0.120	0.120	0.120	0.350	0.230
62	0.000	0.170	0.150	0.150	0.150	0.350	0.300
63	0.000	0.140	0.150	0.150	0.150	0.350	0.250
64	0.000	0.180	0.150	0.150	0.150	0.350	0.250
65	0.000	0.300	0.300	0.300	0.300	0.300	0.340
66	0.000	0.275	0.340	0.340	0.340	0.340	0.340
67	0.000	0.300	0.340	0.340	0.340	0.340	0.340
68	0.000	0.300	0.300	0.300	0.300	0.300	0.300
69	0.000	0.300	0.300	0.300	0.300	0.300	0.300
70	0.000	0.300	0.300	0.300	0.300	0.300	0.300
71	0.000	0.300	0.300	0.300	0.300	0.300	0.300
72	0.000	0.300	0.250	0.250	0.250	0.250	0.250
73	0.000	0.300	0.250	0.250	0.250	0.250	0.250
74	0.000	0.300	0.250	0.250	0.250	0.250	0.250
75	0.000	0.300	0.250	0.250	0.250	0.250	0.250
76	0.000	0.300	0.250	0.250	0.250	0.250	0.250
77	0.000	0.300	0.250	0.250	0.250	0.250	0.250
78	0.000	0.300	0.250	0.250	0.250	0.250	0.250
79	0.000	0.300	0.250	0.250	0.250	0.250	0.250
>=80	0.000	1.000	1.000	1.000	1.000	1.000	1.000



*Schedule E – Teachers’ Actuarial Assumptions and Methods*

Teachers Employees Retirement Rates, Plan 1 Female							
Age	Years of Service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.030	0.030	0.150	0.150
51	0.000	0.000	0.000	0.045	0.030	0.150	0.100
52	0.000	0.000	0.000	0.045	0.040	0.150	0.100
53	0.000	0.000	0.000	0.045	0.040	0.150	0.100
54	0.000	0.000	0.000	0.045	0.045	0.150	0.120
55	0.000	0.045	0.045	0.045	0.050	0.225	0.160
56	0.000	0.060	0.055	0.055	0.055	0.225	0.160
57	0.000	0.060	0.055	0.055	0.055	0.225	0.160
58	0.000	0.070	0.055	0.055	0.055	0.225	0.160
59	0.000	0.080	0.070	0.070	0.070	0.225	0.170
60	0.000	0.090	0.085	0.085	0.085	0.300	0.200
61	0.000	0.250	0.110	0.110	0.110	0.300	0.250
62	0.000	0.250	0.150	0.150	0.150	0.350	0.300
63	0.000	0.250	0.150	0.150	0.150	0.350	0.280
64	0.000	0.250	0.200	0.200	0.200	0.350	0.280
65	0.000	0.350	0.350	0.350	0.350	0.350	0.400
66	0.000	0.300	0.400	0.400	0.400	0.400	0.400
67	0.000	0.300	0.320	0.320	0.320	0.320	0.320
68	0.000	0.300	0.320	0.320	0.320	0.320	0.320
69	0.000	0.300	0.320	0.320	0.320	0.320	0.320
70	0.000	0.300	0.320	0.320	0.320	0.320	0.320
71	0.000	0.300	0.275	0.275	0.275	0.275	0.275
72	0.000	0.300	0.275	0.275	0.275	0.275	0.275
73	0.000	0.300	0.275	0.275	0.275	0.275	0.275
74	0.000	0.300	0.275	0.275	0.275	0.275	0.275
75	0.000	0.300	0.275	0.275	0.275	0.275	0.275
76	0.000	0.300	0.275	0.275	0.275	0.275	0.275
77	0.000	0.300	0.275	0.275	0.275	0.275	0.275
78	0.000	0.300	0.275	0.275	0.275	0.275	0.275
79	0.000	0.300	0.275	0.275	0.275	0.275	0.275
>=80	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule E – Teachers’ Actuarial Assumptions and Methods

**RETIREMENT RATES:** The following rates of retirement are assumed for members eligible to retire from Plan 2 and the Hybrid Plan.

Teachers Employees Retirement Rates, Plan 2 and Hybrid Male																			
Age	Years of Service																		
	0-4	5	6-24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
60	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
61	0.000	0.140	0.100	0.100	0.100	0.100	0.140	0.140	0.140	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
62	0.000	0.150	0.130	0.130	0.130	0.150	0.150	0.150	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
63	0.000	0.150	0.130	0.130	0.150	0.150	0.150	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
64	0.000	0.150	0.140	0.150	0.150	0.150	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
65	0.000	0.300	0.300	0.300	0.300	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
67	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
68	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
69	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
70	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
71	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
72	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
73	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
74	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
75	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
76	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
77	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
78	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
79	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
>=80	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule E – Teachers’ Actuarial Assumptions and Methods

Teachers Employees Retirement Rates, Plan 2 and Hybrid Female																			
Age	Years of Service																		
	0-4	5	6-24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
60	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
61	0.000	0.140	0.100	0.100	0.100	0.100	0.140	0.140	0.140	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
62	0.000	0.150	0.130	0.130	0.130	0.130	0.150	0.150	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
63	0.000	0.150	0.130	0.130	0.130	0.150	0.150	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
64	0.000	0.150	0.140	0.150	0.150	0.150	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
65	0.000	0.300	0.300	0.300	0.300	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
67	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
68	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
69	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
70	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
71	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
72	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
73	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
74	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
75	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
76	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
77	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
78	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
79	0.000	0.300	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
>=80	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



*Schedule E – Teachers’ Actuarial Assumptions and Methods*

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**DISABILITY RATES:** As shown below for selected ages. 5% of disability cases are assumed to be service related.

Teachers Disability Rates		
Age	Male	Female
20	0.000005	0.000003
25	0.000005	0.000023
30	0.000064	0.000081
35	0.000135	0.000196
40	0.000325	0.000481
45	0.000725	0.000792
50	0.001444	0.001609
55	0.002443	0.002521
60	0.003395	0.003321
65	0.003773	0.003509
70	0.003773	0.003509





**Schedule E – Teachers’ Actuarial Assumptions and Methods**

**TERMINATION RATES:** The following are sample withdrawal rates based on age and years of service (for causes other than death, disability, or retirement).

Teachers Termination Rates, Male											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.21024	0.18133	0.15388	0.13077	0.11441	0.10289	0.09263	0.08171	0.07520	0.08410	0.10256
25	0.19207	0.16728	0.14515	0.12651	0.11200	0.10027	0.08948	0.07865	0.07114	0.07386	0.08326
30	0.17373	0.15296	0.13619	0.12212	0.10955	0.09763	0.08634	0.07569	0.06663	0.06067	0.05704
35	0.16839	0.14734	0.13071	0.11712	0.10510	0.09374	0.08315	0.07322	0.06329	0.05217	0.04003
40	0.17192	0.14706	0.12722	0.11176	0.09935	0.08902	0.07978	0.07098	0.06080	0.04704	0.02932
45	0.18182	0.15046	0.12547	0.10682	0.09330	0.08397	0.07608	0.06863	0.05924	0.04581	0.02657
50	0.19523	0.15641	0.12587	0.10367	0.08850	0.07924	0.07216	0.06603	0.05883	0.04925	0.02260
55	0.21008	0.16464	0.12933	0.10382	0.08670	0.07536	0.06833	0.06318	0.05973	0.05790	0.02260
60	0.22536	0.17534	0.13667	0.10856	0.08958	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.24063	0.18847	0.14805	0.11831	0.09792	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.25778	0.20650	0.16623	0.13612	0.11494	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Teachers Termination Rates, Female											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.18402	0.15181	0.13307	0.12138	0.10696	0.09610	0.08820	0.08060	0.06604	0.06553	0.08772
25	0.18376	0.15481	0.13758	0.12581	0.11260	0.10133	0.09186	0.08253	0.06911	0.06524	0.07704
30	0.18401	0.15920	0.14307	0.13106	0.11916	0.10734	0.09622	0.08548	0.07393	0.06510	0.06148
35	0.17757	0.15500	0.13863	0.12610	0.11452	0.10307	0.09292	0.08399	0.07473	0.06273	0.04807
40	0.16719	0.14495	0.12771	0.11411	0.10233	0.09214	0.08464	0.07905	0.07207	0.05823	0.03499
45	0.15616	0.13289	0.11458	0.10011	0.08846	0.07999	0.07497	0.07203	0.06668	0.05362	0.02476
50	0.14917	0.12446	0.10550	0.09113	0.08036	0.07318	0.06863	0.06593	0.06167	0.05381	0.02476
55	0.15060	0.12499	0.10614	0.09285	0.08348	0.07597	0.06925	0.06342	0.06066	0.06295	0.02476
60	0.16342	0.13817	0.12008	0.10819	0.10045	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.18831	0.16489	0.14798	0.13739	0.13130	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.23251	0.21308	0.19795	0.18856	0.18426	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Schedule E – Teachers’ Actuarial Assumptions and Methods

**SALARY INCREASE RATES:** Teachers are assumed to receive their first salary increase on the valuation date. The following salary increase rates are used. Inflation rate of 2.50% plus productivity component of 1.00% plus step-rate/promotional component as shown:

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1	5.95%
2	5.85
3	5.85
4	5.45
5	5.45
6	5.45
7	5.35
8	5.35
9	5.35
10	4.85
11	4.85
12	4.85
13	4.75
14	4.75
15	4.65
16	4.65
17	4.55
18	4.45
19	4.45
20 or more	3.50

**EMPLOYER CONTRIBUTION TO DEFINED CONTRIBUTION HYBRID PLAN:** The valuation assumes an average employer defined contribution rate for members in the Hybrid Plan. This is reported by VRS each valuation.



Schedule E – State Police Actuarial Assumptions and Methods

**STATE POLICE**

**Plan Specific Assumptions and Methods**

**MORTALITY RATES:**

Pre-Retirement:

Pub-2010 Amount Weighted Safety Employee Rates projected generationally; 95% of rates for males; 105% of rates for females set forward 2 years

Post-Retirement:

Pub-2010 Amount Weighted Safety Healthy Retiree Rates projected generationally; 110% of rates for males; 105% of rates for females set forward 3 years

Post-Disablement:

Pub-2010 Amount Weighted General Disabled Rates projected generationally; 95% of rates for males set back 3 years; 90% of rates for females set back 3 years

Beneficiaries and Survivors:

Pub-2010 Amount Weighted Safety Contingent Annuitant Rates projected generationally; 110% of rates for males and females set forward 2 years

Mortality Improvement:

Rates projected generationally with Modified MP-2020 Improvement Scale that is 75% of the MP-2020 rates



**Schedule E – State Police Actuarial Assumptions and Methods**

SPORS Mortality Base Rates								
Age	Male				Female			
	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor
20	0.00039	0.00045	0.00030	0.00044	0.00018	0.00019	0.00011	0.00019
25	0.00035	0.00041	0.00334	0.00043	0.00023	0.00025	0.00175	0.00024
30	0.00039	0.00045	0.00291	0.00047	0.00032	0.00034	0.00176	0.00033
35	0.00045	0.00052	0.00372	0.00055	0.00043	0.00045	0.00276	0.00045
40	0.00056	0.00065	0.00492	0.00074	0.00059	0.00062	0.00431	0.00062
45	0.00078	0.00134	0.00725	0.00656	0.00080	0.00126	0.00679	0.00312
50	0.00114	0.00211	0.01160	0.00822	0.00108	0.00217	0.01050	0.00403
55	0.00166	0.00337	0.01727	0.00976	0.00147	0.00376	0.01428	0.00559
60	0.00251	0.00559	0.02166	0.01243	0.00200	0.00649	0.01650	0.00789
65	0.00390	0.00969	0.02543	0.01791	0.00315	0.01121	0.01846	0.01158
70	0.00728	0.01725	0.03185	0.02818	0.00628	0.01936	0.02205	0.01781
75	0.01360	0.03109	0.04127	0.04466	0.01249	0.03344	0.02915	0.02881
80	0.02541	0.05613	0.05625	0.07148	0.05177	0.05774	0.04210	0.04901
85		0.10049	0.08137	0.11732		0.09971	0.06435	0.08833
90		0.17446	0.11975	0.19311		0.16715	0.09913	0.15347

85% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated as projected with a modified MP-2020 Improvement Scale.



Schedule E – State Police Actuarial Assumptions and Methods

**RETIREMENT RATES:** The following rates of retirement are assumed for members eligible to retire.

SPORS Retirement Rates				
Age	Years of Service			
	0-4	5-24	25	>=26
<=49	0.000	0.000	0.000	0.000
50	0.000	0.100	0.100	0.100
51	0.000	0.030	0.100	0.100
52	0.000	0.030	0.100	0.100
53	0.000	0.030	0.100	0.100
54	0.000	0.030	0.100	0.100
55	0.000	0.060	0.100	0.200
56	0.000	0.060	0.100	0.130
57	0.000	0.060	0.100	0.130
58	0.000	0.100	0.100	0.130
59	0.000	0.100	0.100	0.130
60	0.000	0.100	0.100	0.130
61	0.000	0.100	0.100	0.130
62	0.000	0.200	0.200	0.200
63	0.000	0.200	0.200	0.300
64	0.000	0.200	0.200	0.300
65	0.000	0.200	0.200	0.500
66	0.000	0.200	0.200	0.500
67	0.000	0.200	0.200	0.500
68	0.000	0.200	0.200	0.500
69	0.000	0.200	0.200	0.500
>=70	0.000	1.000	1.000	1.000



Schedule E – State Police Actuarial Assumptions and Methods

**DISABILITY RATES:** As shown below for selected ages. 85% of disability cases are assumed to be service related.

SPORS Disability Rates	
Age	Unisex
<=44	0.00194
45	0.00233
50	0.00481
55	0.00770
60	0.00897
65	0.01108
70	0.01368

**TERMINATION RATES:** The following are sample withdrawal rates based on years of service (for causes other than death, disability, or retirement).

SPORS Termination Rates	
Service	Unisex
0	0.08000
1	0.06000
2	0.06000
3	0.06000
4	0.06000
5	0.06000
6	0.06000
7	0.03000
8	0.03000
9	0.03000
>=10	0.01750



Schedule E – State Police Actuarial Assumptions and Methods

**SALARY INCREASE RATES:** The following salary increase rates are used. Inflation rate of 2.50% plus productivity component of 1.00% plus step-rate/promotional component as shown:

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1	4.75%
2	4.75
3	4.75
4	4.75
5	4.65
6	4.40
7	4.40
8	4.40
9	4.40
10 - 19	4.00
20 or more	3.50

It is assumed members covered under VSDP receive a 3.50% annual increase in pay while disabled and this adjusted pay is used to determine deferred benefits payable from the System.

**DISABILITY ELECTION:** All active members hired on or after January 1, 1999 will enter the Virginia Sickness and Disability Program (VSDP) and will not be eligible to receive non-VSDP disability benefits. For members hired before January 1, 1999 we measure the liabilities based upon the member's actual election contained in the valuation data.



Schedule E – Judicial Actuarial Assumptions and Methods

**JUDICIAL**

**Plan Specific Assumptions and Methods**

**MORTALITY RATES:**

Pre-Retirement:

Pub-2010 Amount Weighted General Employee Rates projected generationally;  
males set forward 2 years

Post-Retirement:

Pub-2010 Amount Weighted General Healthy Retiree Rates projected  
generationally; 95% of rates for males and females set back 2 years

Post-Disablement:

Pub-2010 Amount Weighted General Disabled Rates projected generationally

Beneficiaries and Survivors:

Pub-2010 Amount Weighted General Contingent Annuitant Rates projected  
generationally

Mortality Improvement:

Rates projected generationally with Modified MP-2020 Improvement Scale that is  
75% of the MP-2020 rates





**Schedule E – Judicial Actuarial Assumptions and Methods**

JRS Mortality Base Rates								
Age	Male				Female			
	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor
20	0.00033	0.00034	0.00412	0.00037	0.00013	0.00012	0.00233	0.00013
25	0.00031	0.00030	0.00278	0.00028	0.00009	0.00010	0.00164	0.00009
30	0.00040	0.00031	0.00354	0.00036	0.00015	0.00011	0.00257	0.00015
35	0.00053	0.00040	0.00458	0.00047	0.00023	0.00018	0.00401	0.00023
40	0.00077	0.00054	0.00645	0.00066	0.00036	0.00029	0.00629	0.00036
45	0.00116	0.00079	0.01007	0.00549	0.00056	0.00045	0.00985	0.00262
50	0.00175	0.00121	0.01605	0.00701	0.00083	0.00068	0.01483	0.00320
55	0.00255	0.00353	0.02114	0.00824	0.00123	0.00246	0.01742	0.00446
60	0.00371	0.00506	0.02503	0.01012	0.00186	0.00319	0.01956	0.00622
65	0.00548	0.00732	0.03044	0.01384	0.00296	0.00475	0.02256	0.00899
70	0.00837	0.01168	0.03901	0.02129	0.00489	0.00807	0.02862	0.01353
75	0.01315	0.02023	0.05192	0.03382	0.00808	0.01422	0.04003	0.02151
80	0.06052	0.03586	0.07348	0.05360	0.01330	0.02525	0.06007	0.03573
85		0.06471	0.10815	0.08743		0.04592	0.09331	0.06316
90		0.11350	0.16253	0.14418		0.08594	0.13665	0.11329

5% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated as projected with a modified MP-2020 Improvement Scale.



Schedule E – Judicial Actuarial Assumptions and Methods

**RETIREMENT RATES:** The following rates of retirement are assumed for members eligible to retire with an unreduced retirement benefit.

Judicial Retirement Rates	
Age	Unisex
<=59	0.000
60	0.100
61	0.100
62	0.100
63	0.100
64	0.100
65	0.100
66	0.100
67	0.150
68	0.150
69	0.150
70	0.250
71	0.250
72	0.250
>=73	1.000

**DISABILITY RATES:** There are no assumed rates of disability prior to service retirement for causes other than death or retirement.

**TERMINATION RATES:** There are no assumed rates of withdrawal prior to service retirement for causes other than death or retirement.

**SALARY INCREASE RATES:** Salary increase rates are 4.0%.

**EMPLOYER CONTRIBUTION TO DEFINED CONTRIBUTION HYBRID PLAN:** The valuation assumes an average employer defined contribution rate for members in the Hybrid Plan. This is reported by VRS each valuation.



Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods

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**VIRGINIA LAW OFFICERS**

**Plan Specific Assumptions and Methods**

**MORTALITY RATES:**

Pre-Retirement:

Pub-2010 Amount Weighted Safety Employee Rates projected generationally; 95% of rates for males; 105% of rates for females set forward 2 years

Post-Retirement:

Pub-2010 Amount Weighted Safety Healthy Retiree Rates projected generationally; 110% of rates for males; 105% of rates for females set forward 3 years

Post-Disablement:

Pub-2010 Amount Weighted General Disabled Rates projected generationally; 95% of rates for males set back 3 years; 90% of rates for females set back 3 years

Beneficiaries and Survivors:

Pub-2010 Amount Weighted Safety Contingent Annuitant Rates projected generationally; 110% of rates for males and females set forward 2 years

Mortality Improvement:

Rates projected generationally with Modified MP-2020 Improvement Scale that is 75% of the MP-2020 rates



**Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods**

VaLORS Mortality Base Rates								
Age	Male				Female			
	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor	Pre Retirement	Post Retirement	Post Disablement	Beneficiary & Survivor
20	0.00039	0.00045	0.00030	0.00044	0.00018	0.00019	0.00011	0.00019
25	0.00035	0.00041	0.00334	0.00043	0.00023	0.00025	0.00175	0.00024
30	0.00039	0.00045	0.00291	0.00047	0.00032	0.00034	0.00176	0.00033
35	0.00045	0.00052	0.00372	0.00055	0.00043	0.00045	0.00276	0.00045
40	0.00056	0.00065	0.00492	0.00074	0.00059	0.00062	0.00431	0.00062
45	0.00078	0.00134	0.00725	0.00656	0.00080	0.00126	0.00679	0.00312
50	0.00114	0.00211	0.01160	0.00822	0.00108	0.00217	0.01050	0.00403
55	0.00166	0.00337	0.01727	0.00976	0.00147	0.00376	0.01428	0.00559
60	0.00251	0.00559	0.02166	0.01243	0.00200	0.00649	0.01650	0.00789
65	0.00390	0.00969	0.02543	0.01791	0.00315	0.01121	0.01846	0.01158
70	0.00728	0.01725	0.03185	0.02818	0.00628	0.01936	0.02205	0.01781
75	0.01360	0.03109	0.04127	0.04466	0.01249	0.03344	0.02915	0.02881
80	0.02541	0.05613	0.05625	0.07148	0.05177	0.05774	0.04210	0.04901
85		0.10049	0.08137	0.11732		0.09971	0.06435	0.08833
90		0.17446	0.11975	0.19311		0.16715	0.09913	0.15347

35% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated as projected with a modified MP-2020 Improvement Scale.



*Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods*

**RETIREMENT RATES:** The following rates of retirement are assumed for members eligible to retire.

VaLORS Retirement Rates, Male					
Age	Years of Service				
	0-4	5	6-24	25	>=26
<=49	0.000	0.000	0.000	0.000	0.000
50	0.000	0.150	0.150	0.450	0.450
51	0.000	0.100	0.080	0.300	0.300
52	0.000	0.100	0.080	0.300	0.300
53	0.000	0.100	0.080	0.300	0.250
54	0.000	0.100	0.080	0.240	0.250
55	0.000	0.100	0.080	0.180	0.250
56	0.000	0.100	0.090	0.180	0.250
57	0.000	0.100	0.100	0.180	0.200
58	0.000	0.100	0.100	0.180	0.200
59	0.000	0.100	0.120	0.180	0.200
60	0.000	0.180	0.180	0.180	0.300
61	0.000	0.180	0.200	0.200	0.200
62	0.000	0.180	0.300	0.300	0.300
63	0.000	0.400	0.250	0.250	0.250
64	0.000	0.150	0.250	0.250	0.250
65	0.000	0.150	0.300	0.300	0.300
66	0.000	0.150	0.300	0.300	0.300
67	0.000	0.150	0.300	0.300	0.300
68	0.000	0.150	0.300	0.300	0.300
69	0.000	0.150	0.300	0.300	0.300
>=70	0.000	1.000	1.000	1.000	1.000



Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods

VaLORS Retirement Rates, Female					
Age	Years of Service				
	0-4	5	6-24	25	>=26
<=49	0.000	0.000	0.000	0.000	0.000
50	0.000	0.150	0.150	0.375	0.375
51	0.000	0.100	0.100	0.250	0.200
52	0.000	0.100	0.090	0.250	0.200
53	0.000	0.100	0.090	0.250	0.225
54	0.000	0.100	0.090	0.250	0.300
55	0.000	0.100	0.090	0.250	0.300
56	0.000	0.100	0.100	0.250	0.300
57	0.000	0.100	0.130	0.250	0.180
58	0.000	0.100	0.130	0.400	0.180
59	0.000	0.100	0.130	0.300	0.200
60	0.000	0.200	0.200	0.200	0.200
61	0.000	0.200	0.200	0.200	0.200
62	0.000	0.200	0.350	0.350	0.350
63	0.000	0.200	0.250	0.250	0.250
64	0.000	0.200	0.250	0.250	0.250
65	0.000	0.200	0.500	0.500	0.500
66	0.000	0.200	0.300	0.300	0.300
67	0.000	0.200	0.300	0.300	0.300
68	0.000	0.200	0.300	0.300	0.300
69	0.000	0.200	0.300	0.300	0.300
>=70	0.000	1.000	1.000	1.000	1.000



Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods

**DISABILITY RATES:** As shown below for selected ages. 35% of disability cases are assumed to be service related.

VaLORS Disability Rates		
Age	Male	Female
20	0.00143	0.00543
25	0.00322	0.00581
30	0.00584	0.00659
35	0.00720	0.00769
40	0.00793	0.01001
45	0.00913	0.01381
50	0.01165	0.01821
55	0.01501	0.02277
60	0.01782	0.02901
65	0.01916	0.03865
70	0.01920	0.05499



Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods

**TERMINATION RATES:** The following are sample withdrawal rates based on age and years of service (for causes other than death, disability, or retirement).

VaLORS Termination Rates, Male											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.39130	0.29901	0.23922	0.21072	0.20801	0.21063	0.20749	0.19800	0.19643	0.19065	0.21396
25	0.36285	0.28479	0.23294	0.20555	0.19714	0.19438	0.18892	0.17882	0.17232	0.16314	0.17288
30	0.32624	0.26656	0.22474	0.19872	0.18316	0.17349	0.16486	0.15375	0.14058	0.12618	0.11671
35	0.29590	0.24719	0.21139	0.18685	0.16890	0.15650	0.14654	0.13513	0.11884	0.10094	0.07962
40	0.26990	0.22715	0.19453	0.17109	0.15383	0.14157	0.13160	0.12059	0.10400	0.08381	0.05579
45	0.24947	0.20776	0.17527	0.15163	0.13800	0.12852	0.11960	0.10962	0.09617	0.07511	0.04653
50	0.23564	0.19022	0.15449	0.12845	0.12136	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.22917	0.17523	0.13271	0.10157	0.10390	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.23045	0.16307	0.11015	0.07107	0.08562	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.23923	0.15385	0.08724	0.03755	0.06679	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.25880	0.14725	0.06100	0.00455	0.04490	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

VaLORS Termination Rates, Female											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.47177	0.35733	0.28556	0.25386	0.26029	0.28130	0.30657	0.32166	0.31215	0.30524	0.22840
25	0.43786	0.33985	0.27627	0.24458	0.24051	0.24937	0.26238	0.26963	0.25996	0.24867	0.18991
30	0.39363	0.31781	0.26502	0.23302	0.21502	0.20767	0.20420	0.20042	0.18976	0.17234	0.13686
35	0.35591	0.29532	0.25008	0.21852	0.19421	0.17876	0.16674	0.15620	0.14391	0.12349	0.09981
40	0.32307	0.27240	0.23204	0.20097	0.17622	0.15870	0.14410	0.12972	0.11499	0.09385	0.07347
45	0.29713	0.25007	0.21104	0.17970	0.16112	0.14777	0.13695	0.12161	0.10324	0.08381	0.04500
50	0.27965	0.22915	0.18712	0.15384	0.14876	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.27168	0.21009	0.16023	0.12279	0.13911	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.27367	0.19304	0.13033	0.08631	0.13217	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.28529	0.17815	0.09796	0.04508	0.12790	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.31084	0.16417	0.05830	0.00350	0.12656	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000





Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods

**SALARY INCREASE RATES:** The following salary increase rates are used. Inflation rate of 2.50% plus productivity component of 1.00% plus step-rate/promotional component as shown:

Pay Increase Assumption	
Years of Service	Total Increase (Next Year)
1	4.75%
2	4.75
3	4.75
4	4.75
5	4.65
6	4.40
7	4.40
8	4.40
9	4.40
10 - 19	4.00
20 or more	3.50

It is assumed members covered under VSDP receive a 3.50% annual increase in pay while disabled and this adjusted pay is used to determine deferred benefits payable from the System.

**DISABILITY ELECTION:** All active members hired on or after January 1, 1999 will enter the Virginia Sickness and Disability Program (VSDP) and will not be eligible to receive non-VSDP disability benefits. For members hired before January 1, 1999 we measure the liabilities based upon the member’s actual election contained in the valuation data.



Schedule E – Summary of Actuarial Assumption and Method Changes

**2009 Valuation**

1. Changes to the actuarial assumptions as a result of the experience study for the four-year period ending June 30, 2008 are stated below.

SYSTEM	ASSUMPTION CHANGE
State	Increase rates of withdrawals Increase rates of disability retirement up to age 52, females Decrease rates of disability retirement after age 52, all members Decrease rates of service retirement
Teachers	Increase rates of withdrawals Increase rates of disability retirement Decrease rates of service retirement
SPORS	Decrease rates of withdrawals, males Decrease rates of service retirement
VaLORS	Increase rates of withdrawals Decrease rates of disability retirement Change rates of service retirement
Judicial	Increase rates of salary increases

2. For the June 30, 2009 valuation the Board suspended application of the 80%/120% market value of assets corridor on the actuarial value of assets.

**2010 Valuation**

The investment return rate was decreased from 7.50% per annum to 7.00% per annum.

**2011 Valuation**

The amortization period of the unfunded less the deferred contribution begins at 30 years on June 30, 2011 and will decrease by one each year until reaching the minimum period of 20 years. The deferred contribution, as defined under 2011 Appropriations Act, Item 469(1)(6), is amortized using a level-dollar, closed, 10-year period beginning June 30, 2011.

**2013 Valuation**

1. The amortization period of the unfunded as of June 30, 2013 less the deferred contribution under 2011 Appropriations Act, Item 469(1)(6) is amortized using a level-dollar, closed, 30-year period beginning June 30, 2013 decreasing by one each year until reaching 0 years.



Schedule E – Summary of Actuarial Assumption and Method Changes

- Changes to the actuarial assumptions as a result of the experience study for the four-year period ending June 30, 2012 are summarized below.

STATE SYSTEM	ASSUMPTION CHANGE
State	Update mortality table Decrease rates of service retirement Decrease rates of withdrawals for less than 10 years of service Decrease rates of male disability retirement Reduce rates of salary increase by 0.25% per year
Teachers	Update mortality table Adjustments to rates of service retirement Decrease rates of withdrawals for three through nine years of service Decrease rates of disability Reduce rates of salary increase by 0.25% per year
SPORS	Update mortality table Increase rate of service retirement at age 54
VaLORS	Update mortality table Adjustments to rates of service retirement Decrease rates of withdrawals for females under 10 years of service Increase rates of disability Decrease service-related disability rate from 60% to 50%
Judicial	Update mortality table

**2015 Valuation**

- An administrative expense charge was added to the employer contribution rates to cover administrative expenses.
- The retirement rates for the Judicial plan were extended to age 73 to reflect the change in the mandatory retirement age to 73.



## Schedule E – Summary of Actuarial Assumption and Method Changes

### 2017 Valuation

Changes to the actuarial assumptions as a result of the experience study for the four-year period ending June 30, 2016 are summarized below. In addition to these, the spouse age difference was changed from spouses being the same age as participants to males being two years older than females.

System	Assumption	Description
State	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to a more current mortality table - RP-2014 projected to 2020
	2. Retirement Rates	Lowered rates at older ages and changed final retirement age from 70 to 75
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	Adjusted rates to better match experience
	5. Salary Scale	No change
	6. Line of Duty Disability	Increase rate from 14% to 25%
Teachers	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to a more current mortality table - RP-2014 projected to 2020
	2. Retirement Rates	Lowered rates at older ages and changed final retirement age from 70 to 75
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	Adjusted rates to better match experience
	5. Salary Scale	No change
SPORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to a more current mortality table - RP-2014 projected to 2020 and reduced margin for future improvement in accordance with experience
	2. Retirement Rates	Increased age 50 rates, and lowered rates at older ages
	3. Withdrawal Rates	Adjusted rates to better match experience
	4. Disability Rates	Adjusted rates to better match experience
	5. Salary Increases	No change
	6. Line of Duty Disability	Increase rate from 60% to 85%
VaLORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to a more current mortality table - RP-2014 projected to 2020 and reduced margin for future improvement in accordance with experience
	2. Retirement Rates	Increased age 50 rates, and lowered rates at older ages
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	Adjusted rates to better match experience
	5. Salary Increases	No change
	6. Line of Duty Disability	Decrease rate from 50% to 35%
JRS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to a more current mortality table - RP-2014 projected to 2020
	2. Retirement Rates	Decreased rates at first retirement eligibility
	3. Withdrawal Rates	No change
	4. Disability Rates	Removed disability rates
	5. Salary Increases	No change

In addition to these assumption changes listed above, the method to determine the normal cost rate has changed. Beginning with this valuation, the payroll used to develop the rate will be reduced for those expected to leave during the year. The normal cost rate is also adjusted to reflect that the Hybrid payroll as a percent of the total payroll will increase from the rate setting valuation date to when employers make the contribution.



Schedule E – Summary of Actuarial Assumption and Method Changes

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**2018 Valuation**

The assumed payment form was updated to a modified cash refund annuity. This is a form of payment in which the total benefit received by a member and his or her estate cannot be less than the total contributions made by the member while he or she was an active participant.

**2019 Valuation**

The investment return rate was decreased from 7.00% per annum to 6.75% per annum.



## Schedule E – Summary of Actuarial Assumption and Method Changes

### 2021 Valuation

Changes to the actuarial assumptions as a result of the experience study for the four-year period ending June 30, 2020 are summarized below. In addition to these assumption changes, decrement timing was changed from beginning of the year to mid-year for all plans except Teachers.

System	Assumption	Description
State	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
Teachers	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
SPORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Increased rates for ages 55 to 61, 63, and 64 with 26 or more years of service; changed final retirement age from 65 to 70
	3. Withdrawal Rates	Decreased rate for 0 years of service and increased rates for 1 to 6 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
VaLORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Increased rates at some younger ages, decreased at age 62, and changed final retirement age from 65 to 70
	3. Withdrawal Rates	Adjusted rates to better fit experience at each age and service decrement through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
JRS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Review separately from State employees because exhibit fewer deaths. Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Decreased rates for ages 60-66 and 70-72
	3. Withdrawal Rates	No change
	4. Disability Rates	No change
	5. Salary Increases	Reduce increases across all ages by 0.50%



## *Schedule F – Actuarial Cost Method*

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### **ACTUARIAL COST METHOD**

1. The valuation is prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable at retirement, disability, termination from service or death. The calculations are based on the member's age, years of service, sex, compensation, expected future salary increases, and an assumed future interest earnings rate (currently 6.75%). The calculations consider the probability of a member's death or termination of employment prior to becoming eligible for a benefit and the probability of the member terminating with a service, disability, or survivor's benefit. The present value of the expected benefits payable to active members is added to the present value of the expected future payments to current benefit recipients to obtain the present value of all expected benefits payable to the present group of members and survivors.
2. The employer contributions required to support the benefits of VRS are determined following a level funding approach and consist of a normal contribution and an accrued liability contribution.
3. The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf. The normal cost rate has been developed to cover the cost of new hires during the fiscal year and has also been adjusted to reflect the expected allocation of Plan 1, Plan 2, and Hybrid membership as of the fiscal year in which the contributions are being made.
4. The unfunded accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from the VRS. The accrued liability contribution amortizes the balance of the unfunded accrued liability over a period of years from the valuation date and includes a timing adjustment to reflect the period between the rate setting date and the time employers will actually make contributions.



Schedule G – Summary of Main Plan Provisions

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**Benefit Provisions which apply to all VRS Plans**

<b>Plan Year:</b>	Twelve-month period ending June 30th.
<b>Administration:</b>	All plans are administered by the Board of Trustees of the Virginia Retirement System.
<b>Plan 1:</b>	Members hired prior to July 1, 2010 and who were vested as of January 1, 2013.
<b>Plan 2:</b>	Members hired on or after July 1, 2010, or members hired prior to July 1, 2010 and who were not vested as of January 1, 2013. Members hired after January 1, 2014 in the State Police and Virginia Law Officers Plans are in Plan 2.
<b>Hybrid:</b>	Members hired on or after January 1, 2014 or by member election. There is no Hybrid Plan in the State Police and Virginia Law Officers Plans.
<b>Eligibility:</b>	All full-time, salaried, permanent employees of the Commonwealth of Virginia or of any participating Virginia city, county, town or political subdivision or of any local Virginia school boards are eligible to become members of VRS. This summary covers the provisions relating to state employees.
<b>Employee Contributions:</b>	
<b>Defined Benefit -</b>	Active members in Plan 1 and Plan 2 contribute 5% of their creditable compensation per year. Active members in the Hybrid Plan contribute 4% of their creditable compensation per year. The employer may "pick-up" the member's assessments under the provisions of Internal Revenue Code Section 414(h).
<b>Defined Contribution -</b>	Active members in the Hybrid Plan are required to contribute 1% of their creditable compensation per year to the defined contribution component of the Hybrid Plan. Active members can make voluntary additional contributions of up to 4% of their creditable compensation. The employer matches the required 1% and will match 100% of the first 1% of voluntary contributions plus 50% of additional voluntary contributions up to the 4% maximum.





## Schedule G – Summary of Main Plan Provisions

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**Creditable Compensation:** Annual salary minus any overtime pay, payments of a temporary nature, or payments for extra duties.

**Optional Forms of Payment:** There are optional forms of payment available on an actuarially equivalent basis, as follows:

**100% Survivor Option:**

Payable for the member's life. Upon the member's death, 100% of the benefit continues to the contingent annuitant.

**50% Survivor Option:**

Upon the member's death, 50% of the benefit continues to the contingent annuitant.

**Leveling Option:**

A temporarily increased retirement allowance payable to a date specified by the member and a reduced retirement allowance (on an actuarially equivalent basis) payable after the specified date for the member's remaining lifetime.

**Partial Lump Sum Option:**

The member may elect to receive a lump sum payment equal to the sum of 12, 24, or 36 payments of the standard monthly life annuity. The member's monthly benefit will be actuarially reduced to reflect the lump sum payment. The member may then elect to receive the reduced monthly annuity under any of the other optional forms of payment.

Actuarial equivalence is based on tables adopted by the Board of Trustees.



Schedule G – State Employees’ Plan Provisions

**STATE EMPLOYEES**  
**Plan Specific Benefit Provisions**

<b>Effective Date:</b>	March 1, 1952
<b>Type of Plan:</b>	VRS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered an agent multiple-employer PERS with separate cost-sharing pools for state employees and teachers.
<b>Service:</b>	Employees receive credit of one month of service for each month a contribution is made on their behalf to VRS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate established by the VRS Board. Special rules and limits govern the purchase of additional service.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member’s highest 36 consecutive months of salary.
Plan 2 and Hybrid:	The average of the member’s highest 60 consecutive months of salary.
<b>Normal Retirement:</b>	
Plan 1:	Eligibility:  A member may retire upon Normal Retirement on or after age 65 with credit for five years of service.  Annual Benefit:  1.70% of average final compensation (AFC) times years of service.  Payment Form:  Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.



Schedule G – State Employees’ Plan Provisions

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Plan 2:

Eligibility:

A member may retire upon Normal Retirement after reaching Social Security Normal Retirement Age plus five years of service.

Annual Benefit:

1.70% of average final compensation (AFC) times years of service up to January 1, 2013 plus 1.65% of AFC times years of service from January 1, 2013.

Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.

Hybrid:

Eligibility:

A member may retire upon Normal Retirement after reaching Social Security Normal Retirement Age plus five years of service.

Annual Benefit:

1.00% of average final compensation (AFC) times years of service.

Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.



## Schedule G – State Employees’ Plan Provisions

### **Early Retirement:**

Plan 1:

Eligibility:

A member may retire early after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.

Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and multiplied by a reduction factor. No reduction applies if the member has credit for thirty years of service at retirement and is at least age 50. For members at least age 55, the reduction is 0.5% per month for the first 60 months and 0.4% per month for the next 60 months. This reduction is applied for each month that the retirement age precedes 65, or if more favorable, for each month the service at retirement is less than 30. For members younger than 55 at retirement, the reduction factor determined as though the member were 55 is further reduced by multiplying it by a second factor, to reflect a 0.6% reduction for each month retirement precedes age 55.

Payment Form:

Same as for Normal Retirement above.

Plan 2 & Hybrid:

Eligibility:

A member may retire early after reaching age 60 with five years of service, or upon the sum of their age and their service being 90 (Rule of 90).

Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and multiplied by a reduction factor similar to Plan 1. No reduction is applied if the sum of the member’s age and service is equal to 90.

Payment Form:

Same as for Normal Retirement above.



## Schedule G – State Employees’ Plan Provisions

### **Disability Retirement - Non-VSDP: Eligibility:**

A member hired prior to 1/1/1999 and who has declined VSDP coverage is eligible from the first day of employment.

### **Annual Benefit:**

For members with less than five years of service credit, the minimum guaranteed benefit. For members with greater than five years of service credit, the greater of the minimum guaranteed benefit and 1.70% of AFC times service credit. Benefit is reduced by Worker's Compensation (if any).

### **Minimum Guaranteed Benefit:**

- **Workers Compensation Guarantee:**  
  
66 2/3% of AFC if member does not qualify for primary Social Security and 50% of AFC if member qualifies for primary Social Security.
- **Special Retirement Allowance Guarantee:**  
  
50% of AFC if member does not qualify for primary Social Security and 33 1/3% of AFC if member qualifies for primary Social Security.

### **Service Credit:**

If disability occurs before age 60, service is the smaller of 1) twice actual service, and 2) rendered service plus the number of years remaining between age at disability and age 60.

### **Payment Form:**

The disability benefit commences immediately upon the member's retirement. Benefits cease upon recovery or reemployment. Disability benefits are payable as a monthly life annuity with a guarantee that, at the member's death, the sum of the member's contributions plus interest as of the date of retirement will be paid in a lump sum to the member's beneficiary. 100% and 50% Survivor Options are also permitted for disability retirement. (A refund of the member's contribution account is paid out for a work-related disability.)



## Schedule G – State Employees’ Plan Provisions

### **Disability Retirement – VSDP:**

Provisions applying to members entering in 1999 or later and continuing members who have elected this benefit: In lieu of the above benefits, these members will be covered by the Virginia Sickness and Disability Program (VSDP). Under VSDP, these members will receive a deferred benefit payable at age 65 from this plan. The deferred benefit will be computed like a normal retirement benefit. For this calculation, a member's creditable service will include the period of disability, and the Average Final Compensation will be adjusted to reflect increases in the cost-of-living between the date of disability and age 65. If the member dies while disabled before age 65, a death benefit will be determined as though the employee were an active member.

### **Deferred Termination Benefit:**

Plan 1:

Eligibility:

A member with at least five years of service who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit.

Annual Benefit:

Same as normal retirement benefit, but both AFC and service are determined at the time the member leaves active employment. Benefits may commence unreduced at age 65 or at age 50 with at least 30 years of service. Reduced benefits may commence at or after age 55 with more than 5 years of service or age 50 with at least 10 years of service.

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

The beneficiary of a member who dies after leaving active service but before retiring is entitled to receive a lump sum distribution of the deceased member's contribution account.



Schedule G – State Employees’ Plan Provisions

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Plan 2 & Hybrid:

Eligibility:

A member with at least five years of service who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit.

Annual Benefit:

Same as normal retirement benefit, but both AFC and service are determined at the time the member leaves active employment. Benefits commence unreduced at Social Security Normal Retirement Age. Reduced benefits may commence on or after age 60 with five years of service.

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

The beneficiary of a member who dies after leaving active service but before retiring is entitled to receive a lump sum distribution of the deceased member's contribution account.

**Withdrawal (Refund) Benefit:**

Eligibility:

All members leaving covered employment with less than five years of service are eligible. Optionally, vested members (those with five or more years of service) may withdraw their contributions plus interest in lieu of the deferred benefits otherwise due.

Benefit:

The member who withdraws receives a lump-sum payment of his/her employee contributions, plus the interest credited on these contributions. Interest is credited at 4%.



## Schedule G – State Employees’ Plan Provisions

### **Death Benefit:**

#### Eligibility:

Death must have occurred while an active or inactive, non-retired member.

#### Benefit:

Upon the death of a non-vested member, a refund of the member's contributions and interest is paid. Upon the death of a vested member, if death occurs while in active service the qualifying survivor of the member is entitled to receive a benefit determined as though the member retired, elected the 100% Survivor Option, then died. If the member dies before reaching age 55, the member is assumed to be 55 for benefit calculation purposes. The qualifying survivor may elect to receive a refund of the contributions plus interest in lieu of the monthly benefit. If the death occurs while inactive, benefits payable are described in Section 9(d).

#### Work-Related Death:

Qualifying survivor would receive 50% of AFC if beneficiary does not qualify for Social Security survivor benefits and 33 1/3% of AFC if beneficiary qualifies for Social Security survivor benefits. This benefit is reduced by Worker's Compensation. In addition, a refund of the member's contribution account is paid to the beneficiary.

### **Cost-of-Living Increase:**

#### Plan 1:

Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.

#### Plan 2 and Hybrid:

Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%.

#### Plans 1, 2 & Hybrid:

The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within five years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.





Schedule G – Teachers’ Plan Provisions

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**TEACHERS**  
**Plan Specific Benefit Provisions**

<b>Effective Date:</b>	March 1, 1952
<b>Type of Plan:</b>	VRS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered an agent multiple-employer PERS with separate cost-sharing pools for state employees and teachers.
<b>Service:</b>	Employees receive credit of one month of service for each month a contribution is made on their behalf to VRS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate established by the VRS Board. Special rules and limits govern the purchase of additional service.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member’s highest 36 consecutive months of salary.
Plan 2 and Hybrid:	The average of the member’s highest 60 consecutive months of salary.
<b>Normal Retirement:</b>	
Plan 1:	Eligibility:  A member may retire upon Normal Retirement on or after age 65 with credit for five years of service.  Annual Benefit:  1.70% of average final compensation (AFC) times years of service.  Payment Form:  Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.



## Schedule G – Teachers’ Plan Provisions

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Plan 2:

Eligibility:

A member may retire upon Normal Retirement after reaching Social Security Normal Retirement Age plus five years of service.

Annual Benefit:

1.70% of average final compensation (AFC) times years of service up to January 1, 2013 plus 1.65% of AFC times years of service from January 1, 2013.

Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.

Hybrid:

Eligibility:

A member may retire upon Normal Retirement after reaching Social Security Normal Retirement Age plus five years of service.

Annual Benefit:

1.00% of average final compensation (AFC) times years of service.

Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.



## Schedule G – Teachers’ Plan Provisions

### **Early Retirement:**

Plan 1:

Eligibility:

A member may retire early after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.

Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and multiplied by a reduction factor. No reduction applies if the member has credit for thirty years of service at retirement and is at least age 50. For members at least age 55, the reduction is 0.5% per month for the first 60 months and 0.4% per month for the next 60 months. This reduction is applied for each month that the retirement age precedes 65, or if more favorable, for each month the service at retirement is less than 30. For members younger than 55 at retirement, the reduction factor determined as though the member were 55 is further reduced by multiplying it by a second factor, to reflect a 0.6% reduction for each month retirement precedes age 55.

Payment Form:

Same as for Normal Retirement above.

Plan 2 and Hybrid:

Eligibility:

A member may retire early after reaching age 60 with five years of service or upon the sum of their age and their service being 90 (Rule of 90).

Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and multiplied by a reduction factor similar to Plan 1. No reduction is applied if the sum of the member’s age and service is equal to 90.

Payment Form:

Same as for Normal Retirement above.



## Schedule G – Teachers’ Plan Provisions

### **Disability Retirement (Plan 1 and Plan 2):**

#### Eligibility:

A member is eligible from the first day of employment.

#### Annual Benefit:

For members with less than five years of service credit, the minimum guaranteed benefit. For members with greater than five years of service credit, the greater of the minimum guaranteed benefit and 1.70% of AFC times service credit. Benefit is reduced by Worker's Compensation (if any).

#### Minimum Guaranteed Benefit:

- Workers Compensation Guarantee:  
  
66 2/3% of AFC if member does not qualify for primary Social Security and 50% of AFC if member qualifies for primary Social Security.
- Special Retirement Allowance Guarantee:  
  
50% of AFC if member does not qualify for primary Social Security and 33 1/3% of AFC if member qualifies for primary Social Security.

#### Service Credit:

If disability occurs before age 60, service is the smaller of 1) twice actual service, and 2) rendered service plus the number of years remaining between age at disability and age 60.

#### Payment Form:

The disability benefit commences immediately upon the member's retirement. Benefits cease upon recovery or reemployment. Disability benefits are payable as a monthly life annuity with a guarantee that, at the member's death, the sum of the member's contributions plus interest as of the date of retirement will be paid in a lump sum to the member's beneficiary. 100% and 50% Survivor Options are also permitted for disability retirement. (A refund of the member's contribution account is paid out for a work-related disability.)



## Schedule G – Teachers’ Plan Provisions

### **Disability Retirement – VLDP (Hybrid Plan):**

Provisions applying to Hybrid members: In lieu of the above benefits, these members will be covered by the Virginia Local Disability Program (VLDP). Under VLDP, these members will receive a deferred benefit payable at normal retirement from this plan. The deferred benefit will be computed like a normal retirement benefit. For this calculation, a member's creditable service will include the period of disability, and the Average Final Compensation will be adjusted to reflect increases in the cost-of-living between the date of disability and the date of normal retirement. If the member dies while disabled before normal retirement, a death benefit will be determined as though the employee were an active member.

### **Deferred Termination Benefit:**

Plan 1:

Eligibility:

A member with at least five years of service who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit.

Annual Benefit:

Same as normal retirement benefit, but both AFC and service are determined at the time the member leaves active employment. Benefits may commence unreduced at age 65 or at age 50 with at least 30 years of service. Reduced benefits may commence at or after age 55 with more than 5 years of service or age 50 with at least 10 years of service.

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

The beneficiary of a member who dies after leaving active service but before retiring is entitled to receive a lump sum distribution of the deceased member's contribution account.



## Schedule G – Teachers’ Plan Provisions

Plan 2 and Hybrid:

Eligibility:

A member with at least five years of service who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit.

Annual Benefit:

Same as normal retirement benefit, but both AFC and service are determined at the time the member leaves active employment. Benefits commence unreduced at Social Security Normal Retirement Age. Reduced benefits may commence on or after age 60 with five years of service.

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

The beneficiary of a member who dies after leaving active service but before retiring is entitled to receive a lump sum distribution of the deceased member's contribution account.

**Withdrawal (Refund) Benefit:**

Eligibility:

All members leaving covered employment with less than five years of service are eligible. Optionally, vested members (those with five or more years of service) may withdraw their contributions plus interest in lieu of the deferred benefits otherwise due.

Benefit:

The member who withdraws receives a lump-sum payment of his/her employee contributions, plus the interest credited on these contributions. Interest is credited at 4%.

**Death Benefit:**

Eligibility:

Death must have occurred while an active or inactive, non-retired member.



## Schedule G – Teachers’ Plan Provisions

### Benefit:

Upon the death of a non-vested member, a refund of the member's contributions and interest is paid. Upon the death of a vested member, if death occurs while in active service the qualifying survivor of the member is entitled to receive a benefit determined as though the member retired, elected the 100% Survivor Option, then died. If the member dies before reaching age 55, the member is assumed to be 55 for benefit calculation purposes. The qualifying survivor may elect to receive a refund of the contributions plus interest in lieu of the monthly benefit. If the death occurs while inactive, benefits payable are described in Section 9(d).

### Work-Related Death:

Qualifying survivor would receive 50% of AFC if beneficiary does not qualify for Social Security survivor benefits and 33 1/3% of AFC if beneficiary qualifies for Social Security survivor benefits. This benefit is reduced by Worker's Compensation. In addition, a refund of the member's contribution account is paid to the beneficiary.

### Cost-of-Living Increase:

- Plan 1: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.
- Plan 2 and Hybrid: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%.
- Plans 1, 2 & Hybrid: The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within five years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.



Schedule G – State Police Plan Provisions

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**STATE POLICE**  
**Plan Specific Benefit Provisions**

<b>Effective Date:</b>	July 1, 1950
<b>Type of Plan:</b>	SPORS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.
<b>Service:</b>	Employees receive credit of one month of service for each month a contribution is made on their behalf to SPORS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate established by the VRS Board. Special rules and limits govern the purchase of additional service.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member's highest 36 consecutive months of salary.
Plan 2:	The average of the member's highest 60 consecutive months of salary.
<b>Normal Retirement:</b>	Eligibility:  A member may retire upon Normal Retirement on or after age 60 with credit for five years of service.  Annual Benefit:  1.85% of average final compensation (AFC) times years of service for retirements on or after July 1, 2007 (1.70% of AFC times years of service for retirements prior to July 1, 2007).  Payment Form:  Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.





## Schedule G – State Police Plan Provisions

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### Temporary Supplement:

A member hired on or after July 1, 1974 who has 20 or more years of hazardous service at retirement or a member hired before July 1, 1974 who is vested under SPORS/VaLORS benefits shall receive an additional annual retirement allowance of \$14,664 payable from the date of retirement to their Social Security normal retirement age. This amount is adjusted biennially based upon increases in Social Security benefits during the interim period.

### Early Retirement:

#### Eligibility:

A member may retire early after reaching age 50 with at least five years of service.

#### Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and reduced by 1/2% for the first 60 months and 4/10% for any additional months of early retirement. This reduction is applied for each month that the retirement age precedes 60, or if more favorable, for each month the service at retirement is less than 25. No reduction applies if the member has credit for 25 years of service at retirement.

#### Payment Form:

Same as for Normal Retirement above.

### Temporary Supplement:

A member hired on or after July 1, 1974 who has 20 or more years of hazardous service at retirement or a member hired before July 1, 1974 who is vested under SPORS/VaLORS benefits shall receive an additional annual retirement allowance of \$14,664 payable from the date of retirement to their Social Security normal retirement age. This amount is adjusted biennially based upon increases in Social Security benefits during the interim period.



## Schedule G – State Police Plan Provisions

### **Disability Retirement**

#### **- Non-VSDP:**

#### Eligibility:

A member hired prior to 1/1/1999 and who has declined VSDP coverage is eligible from the first day of employment.

#### Monthly Benefit:

For members with less than five years of service credit, the minimum guaranteed benefit. For members with greater than five years of service credit, the greater of the minimum guaranteed benefit and 1.70% of AFC times service credit. Benefit is reduced by Worker's Compensation (if any).

#### Minimum Guaranteed Benefit:

- **Workers Compensation Guarantee:**  
  
66 2/3% of AFC if member does not qualify for primary Social Security and 50% of AFC if member qualifies for primary Social Security.
- **Special Retirement Allowance Guarantee:**  
  
50% of AFC if member does not qualify for primary Social Security and 33 1/3% of AFC if member qualifies for primary Social Security.

#### Service Credit:

If disability occurs before age 60, service is the smaller of 1) twice actual service, and 2) rendered service plus the number of years remaining between age at disability and age 60.

#### Payment Form:

The disability benefit commences immediately upon the member's retirement. Benefits cease upon recovery or reemployment. Disability benefits are payable as a monthly life annuity with a guarantee that, at the member's death, the sum of the member's contributions plus interest as of the date of retirement will be paid in a



## Schedule G – State Police Plan Provisions

lump sum to the member's beneficiary. 100% and 50% Survivor Options are also permitted for disability retirement. (A refund of the member's contribution account is paid out for a work-related disability.)

### **Disability Retirement – VSDP:**

Provisions applying to members entering in 1999 or later and continuing members who have elected this benefit: In lieu of the above benefits, these members will be covered by the Virginia Sickness and Disability Program (VSDP). Under VSDP, these members will receive a deferred benefit payable at age 60 from this plan. The deferred benefit will be computed like a normal retirement benefit. For this calculation, a member's creditable service will include the period of disability, and the Average Final Compensation will be adjusted to reflect increases in the cost-of-living between the date of disability and age 60. If the member dies while disabled before age 60, a death benefit will be determined as though the employee were an active member.

### **Deferred Termination Benefit:**

#### Eligibility:

A member with at least five years of service who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit.

#### Annual Benefit:

Same as normal retirement benefit, but both AFC and service are determined at the time the member leaves active employment. Benefits may commence unreduced at age 60 or at age 50 with at least 25 years of service. Reduced benefits may commence at or after age 50 if the member is not eligible for an unreduced benefit.

#### Payment Form:

The form of payment is the same as for Normal Retirement above.

#### Death Benefit:

The beneficiary of a member who dies after leaving active service but before retiring is entitled to receive a lump sum distribution of the deceased member's contribution account.



## Schedule G – State Police Plan Provisions

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### **Withdrawal (Refund) Benefit:**

#### Eligibility:

All members leaving covered employment with less than five years of service are eligible. Optionally, vested members (those with five or more years of service) may withdraw their contributions plus interest in lieu of the deferred benefits otherwise due.

#### Benefit:

The member who withdraws receives a lump-sum payment of his/her employee contributions, plus the interest credited on these contributions. Interest is credited at 4%.

### **Death Benefit:**

#### Eligibility:

Death must have occurred while an active, non-retired member.

#### Benefit:

Upon the death of a non-vested member, a refund of the member's contributions and interest is paid. Upon the death of a vested member, if death occurs while in active service the qualifying survivor of the member is entitled to receive a benefit determined as though the member retired, elected the 100% Survivor Option, then died. If the member dies before reaching age 50, the member is assumed to be 50 for benefit calculation purposes. The qualifying survivor may elect to receive a refund of the contributions plus interest in lieu of the monthly benefit. If the death occurs while inactive, benefits payable are described in Section 9(d).

#### Work-Related Death:

Qualifying survivor would receive 50% of AFC if beneficiary does not qualify for Social Security survivor benefits and 33 1/3% of AFC if beneficiary qualifies for Social Security survivor benefits. This benefit is reduced by Worker's Compensation. In addition, a refund of the member's contribution account is paid to the beneficiary.



## Schedule G – State Police Plan Provisions

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### **Cost-of-Living Increase:**

- Plan 1: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.
- Plan 2: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%. This COLA will be deferred until the date at which the member is eligible for unreduced retirement.
- Plans 1 & 2: The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within five years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.



*Schedule G – Judicial Plan Provisions*

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**JUDICIAL**  
**Plan Specific Benefit Provisions**

**Effective Date:** July 1, 1970

**Type of Plan:** JRS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.

**Service:**

Appointed or elected  
prior to 7/1/2010:

Employees receive credit of one month of service multiplied by a weighting factor of 3.5 (2.5 for judges entering JRS on or after January 1, 1995) for each month a contribution is made on their behalf to JRS. This weighted service is used for all purposes under this plan, including determining a member's vested status, determining whether a member is eligible for retirement, computing early retirement reductions, and computing the amount of the benefit. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate established by the VRS Board. Special rules and limits govern the purchase of additional service.

Appointed or elected  
on and after 7/1/2010:

Employees receive credit of one month of service multiplied by a tiered weighting factor for each month a contribution is made on their behalf to JRS. First term judges under age 45 at the time of appointment/election use a weighing factor of 1.5, judges age 45 – 54 use a weighing factor of 2.0, and judges age 55 and above use a weighing factor of 2.5. This weighted service is used for all purposes under this plan, including determining a member's vested status, determining whether a member is eligible for retirement, computing early retirement reductions, and computing the amount of the benefit. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate established by the VRS Board. Special rules and limits govern the purchase of additional service.



## Schedule G – Judicial Plan Provisions

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### **Average Final Compensation:**

Plan 1:	The average of the member's highest 36 consecutive months of salary.
Plan 2 and Hybrid:	The average of the member's highest 60 consecutive months of salary.

### **Normal Retirement:**

#### Eligibility:

A member may retire upon Normal Retirement on or after age 65 with credit for five years of service. The mandatory retirement age for judges is age 73.

#### Annual Benefit:

1.70% of average final compensation (AFC) times years of service, not to exceed 78% of AFC. For members appointed or elected on or after January 1, 2013, the benefit multiplier is 1.65% and for members appointed or elected on or after January 1, 2014, the benefit multiplier is 1.00%

#### Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.

### **Early Retirement:**

#### Eligibility:

A member may retire early after reaching age 55 with credit for five years of service.

#### Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and multiplied by a reduction factor. No reduction applies if the member has reached age 60 and has credit for 30 or more years of creditable service. For other members, the reduction is 0.5% per month for the first 60 months and 0.4% per month for the next 60 months. This reduction is measured



## Schedule G – Judicial Plan Provisions

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from the later of age 60 and the point at which the member would have earned 30 years of service, or if more favorable, from age 65.

### Payment Form:

Same as for Normal Retirement above.

### **Disability Retirement:**

#### Eligibility:

A member is eligible from the first day of employment.

#### Annual Benefit:

For members with less than five years of service credit, the minimum guaranteed benefit. For members with greater than five years of service credit, the greater of the minimum guaranteed benefit and 1.70% of AFC times service credit (1.65% if appointed or elected on or after January 1, 2013 and 1.00% if appointed or elected on or after January 1, 2014). Benefit is reduced by Worker's Compensation (if any).

#### Minimum Guaranteed Benefit:

- Workers Compensation Guarantee:  

66 2/3% of AFC if member does not qualify for primary Social Security and 50% of AFC if member qualifies for primary Social Security.
- Special Retirement Allowance Guarantee  

50% of AFC if member does not qualify for primary Social Security and 33 1/3% of AFC if member qualifies for primary Social Security.

#### Service Credit:

If disability occurs before age 60, service is the smaller of 1) twice actual service, and 2) rendered service plus the number of years remaining between age at disability and age 60.





## Schedule G – Judicial Plan Provisions

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### Payment Form:

The disability benefit commences immediately upon the member's retirement. Benefits cease upon recovery or reemployment. Disability benefits are payable as a monthly life annuity with a guarantee that, at the member's death, the sum of the member's contributions plus interest as of the date of retirement will be paid in a lump sum to the member's beneficiary. 100% and 50% Survivor Options are also permitted for disability retirement. (A refund of the member's contribution account is paid out for a work-related disability.)

### **Deferred Termination Benefit:**

#### Eligibility:

A member with at least five years of service who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit

#### Annual Benefit:

Same as normal retirement benefit, but both AFC and service are determined at the time the member leaves active employment. Benefits may commence unreduced at age 65 or at age 60 with at least 30 years of service. Reduced benefits may commence at or after age 55 if the member is not eligible for an unreduced benefit.

#### Payment Form:

The form of payment is the same as for Normal Retirement above.

#### Death Benefit:

The beneficiary of a member who dies after leaving active service but before retiring is entitled to receive a lump sum distribution of the deceased member's contribution account.



## Schedule G – Judicial Plan Provisions

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### **Withdrawal (Refund) Benefit:**

#### Eligibility:

All members leaving covered employment with less than five years of service are eligible. Optionally, vested members (those with five or more years of service) may withdraw their contributions plus interest in lieu of the deferred benefits otherwise due.

#### Benefit:

The member who withdraws receives a lump-sum payment of his/her employee contributions, plus the interest credited on these contributions. Interest is credited at 4%.

### **Death Benefit:**

#### Eligibility:

Death must have occurred while an active, non-retired member.

#### Benefit:

Upon the death of a non-vested member, a refund of the member's contributions and interest is paid. Upon the death of a vested member, if death occurs while in active service the qualifying survivor of the member is entitled to receive a benefit determined as though the member retired, elected the 100% Survivor Option, then died. If the member dies before reaching age 55, the member is assumed to be 55 for benefit calculation purposes. The qualifying survivor may elect to receive a refund of the contributions plus interest in lieu of the monthly benefit. If the death occurs while inactive, benefits payable are described in Section 8(d).

#### Work-Related Death:

Qualifying survivor would receive 50% of AFC if beneficiary does not qualify for Social Security survivor benefits, and 33 1/3% of AFC if beneficiary qualifies for Social Security survivor benefits. This benefit is reduced by Worker's Compensation. In addition, a refund of the member's contribution account is paid to the beneficiary.



## *Schedule G – Judicial Plan Provisions*

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### **Cost-of-Living Increase:**

- Plan 1: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.
- Plan 2 and Hybrid: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%.
- Plans 1, 2 & Hybrid: The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within five years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.



Schedule G – Virginia Law Officers’ Plan Provisions

**VIRGINIA LAW OFFICERS  
Plan Specific Benefit Provisions**

<b>Effective Date:</b>	October 1, 1999
<b>Type of Plan:</b>	VaLORS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.
<b>Service:</b>	Employees receive credit of one month of service for each month a contribution is made on their behalf to VaLORS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate established by the VRS Board. Special rules and limits govern the purchase of additional service.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member’s highest 36 consecutive months of salary.
Plan 2:	The average of the member’s highest 60 consecutive months of salary.
<b>Normal Retirement:</b>	Eligibility:  A member may retire upon Normal Retirement on or after age 60 with credit for five years of service.  Annual Benefit:  For all employees hired on or after July 1, 2001, the benefit is calculated as 2.00% of average final compensation (AFC) times years of service.  Employees hired before July 1, 2001, must make a one-time election to receive benefits under (i) or (ii) below:  (i) 1.70% of average final compensation (AFC) times years of service plus the temporary supplement described in 5(d).  (ii) 2.00% of average final compensation (AFC) times years of service and no temporary supplement.



## Schedule G – Virginia Law Officers’ Plan Provisions

### Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in a lump sum to the member's beneficiary. Optional forms of payment are available.

### Temporary Supplement:

Temporary Supplement: A member who is hired before July 1, 2001, and who was either (i) hired on or after July 1, 1974 who has 20 or more years of hazardous service at retirement or (ii) a member hired before July 1, 1974 who is vested under SPORS/VaLORS benefits shall be eligible to receive an additional annual retirement allowance of \$14,664 payable from the date of retirement to age 65. This amount is adjusted biennially based upon increases in Social Security benefits during the interim period. The eligible employee must have made a one-time election to receive benefits under b(i) to receive this supplement.

### Early Retirement:

#### Eligibility:

A member may retire early after reaching age 50 with credit for five years of service.

#### Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and reduced by 0.5% per month for the first 60 months and 0.4% per month for any additional months of early retirement. This reduction is applied for each month that the retirement age precedes 60, or if more favorable, for each month the service at retirement is less than 25. No reduction applies if the member has credit for 25 years of service at retirement.

#### Payment Form:

Same as for Normal Retirement above.



## Schedule G – Virginia Law Officers’ Plan Provisions

### Temporary Supplement:

Temporary Supplement: A member who is hired before July 1, 2001, and who was either (i) hired on or after July 1, 1974 who has 20 or more years of hazardous service at retirement or (ii) a member hired before July 1, 1974 who is vested under SPORS/VaLORS benefits shall be eligible to receive an additional annual retirement allowance or \$14,664 payable from the date of retirement to age 65. This amount is adjusted biennially based upon increases in Social Security benefits during the interim period. The eligible employee must have made a one-time election to receive benefits under 5(b)(i) to receive this supplement.

### **Disability Retirement**

#### **- Non-VSDP:**

#### Eligibility:

A member hired prior to 1/1/1999 and who has declined VSDP coverage is eligible from the first day of employment.

#### Monthly Benefit:

For members with less than five years of service credit, the minimum guaranteed benefit. For members with greater than five years of service credit, the greater of the minimum guaranteed benefit and 1.70% of AFC times service credit. Benefit is reduced by Worker's Compensation (if any).

#### Minimum Guaranteed Benefit:

- Workers Compensation Guarantee:  
  
66  $\frac{2}{3}$ % of AFC if member does not qualify for primary Social Security and 50% of AFC if member qualifies for primary Social Security.
- Special Retirement Allowance Guarantee:  
  
50% of AFC if member does not qualify for primary Social Security and 33  $\frac{1}{3}$ % of AFC if member qualifies for primary Social Security.



## Schedule G – Virginia Law Officers’ Plan Provisions

### Service Credit:

If disability occurs before age 60, service is the smaller of 1) twice actual service, and 2) rendered service plus the number of years remaining between age at disability and age 60.

### Payment Form:

The disability benefit commences immediately upon the member's retirement. Benefits cease upon recovery or reemployment. Disability benefits are payable as a monthly life annuity with a guarantee that, at the member's death, the sum of the member's contributions plus interest as of the date of retirement will be paid in a lump sum to the member's beneficiary. 100% and 50% Survivor Options are also permitted for disability retirement. (A refund of the member's contribution account is paid out for a work-related disability.)

### **Disability Retirement – VSDP:**

Provisions applying to members entering in 1999 or later and continuing members who have elected this benefit: In lieu of the above benefits, these members will be covered by the Virginia Sickness and Disability Program (VSDP). Under VSDP, these members will receive a deferred benefit payable at age 60 from this plan. The deferred benefit will be computed like a normal retirement benefit. For this calculation, a member's creditable service will include the period of disability, and the Average Final Compensation will be adjusted to reflect increases in the cost-of-living between the date of disability and age 60. If the member dies while disabled before age 60, a death benefit will be determined as though the employee were an active member.

### **Deferred Termination Benefit:**

#### Eligibility:

A member with at least five years of service who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit.

#### Annual Benefit:

Same as normal retirement benefit, but both AFC and service are determined at the time the member leaves active employment. Benefits may commence unreduced at age 60 or at age 50 with at least 25 years of service.



## Schedule G – Virginia Law Officers’ Plan Provisions

Reduced benefits may commence at or after age 50 if the member is not eligible for an unreduced benefit.

### Payment Form:

The form of payment is the same as for Normal Retirement above.

### Death Benefit:

The beneficiary of a member who dies after leaving active service but before retiring is entitled to receive a lump sum distribution of the deceased member's contribution account.

### **Withdrawal (Refund) Benefit:**

#### Eligibility:

All members leaving covered employment with less than five years of service are eligible. Optionally, vested members (those with five or more years of service) may withdraw their contributions plus interest in lieu of the deferred benefits otherwise due.

#### Benefit:

The member who withdraws receives a lump-sum payment of his/her employee contributions, plus the interest credited on these contributions. Interest is credited at 4%.

### **Death Benefit:**

#### Eligibility:

Death must have occurred while an active or inactive, non-retired member.

#### Benefit:

Upon the death of a non-vested member, a refund of the member's contributions and interest is paid. Upon the death of a vested member, if death occurs while in active service the qualifying survivor of the member is entitled to receive a benefit determined as though the member retired, elected the 100% Survivor Option, then died. If the member dies before reaching age 50, the member is assumed to be 50 for benefit calculation purposes. The qualifying survivor may elect to receive a refund of the contributions plus interest in lieu of the monthly benefit.





## Schedule G – Virginia Law Officers’ Plan Provisions

If the death occurs while inactive, benefits payable are described in Section 9(d).

### Work-Related Death:

Qualifying survivor would receive 50% of AFC if beneficiary does not qualify for Social Security survivor benefits and 33 1/3% of AFC if beneficiary qualifies for Social Security survivor benefits. This benefit is reduced by Worker's Compensation. In addition, a refund of the member's contribution account is paid to the beneficiary.

### Cost-of-Living Increase:

- Plan 1: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.
- Plan 2: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%.
- Plans 1 & 2: The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within five years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.



## Schedule G – Summary of Plan Changes

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### Summary of Plan Changes

#### 1996 Valuation

1. Any member with at least 25 years of service may purchase prior service credit for a) active duty military service in the armed forces of the United States, b) certified creditable service in the retirement system of another state, or c) both at the rate of 5% of current compensation or average final compensation, if greater, times years of service purchased.
2. VRS may enter into an agreement with any political subdivision of the Commonwealth of Virginia which has a defined benefit plan that is not supplemental to VRS to permit portability of service credit on a cost-neutral basis.
3. Early retirement is allowed at age 50 with 10 years of service. The early retirement benefit is determined as if the member is age 55 (but using actual service and AFC) reduced by 0.6% for each month the member is younger than age 55. This benefit can be no smaller than the value of the member's contributions and interest paid in monthly installments over the member's lifetime.
4. The service multiplier for judges entering the Retirement System after January 1, 1995 is 2.5.
5. Effective 7/1/98, a health credit of \$1.50 per month per year of service (up to 30 years) is automatically provided to teachers in VRS who retire with at least 15 years of service. An additional credit of \$1.00 per month per year of service (up to 30 years) can be provided.

#### 1998 Valuation

1. Effective January 1, 1999, the retirement benefit became 1.7% of average final pay times years of service. The 3% benefit adjustment was eliminated for future retirees. A 1.6% ad hoc benefit increase was provided for all retirees and beneficiaries receiving benefits as of December 31, 1999.
2. On January 1, 1999, the Virginia Sickness and Disability Program became effective. All future new members will be covered by this program and will only receive a deferred retirement benefit from VRS. Members joining before 1999 were allowed to make a one-time irrevocable election to join this program. (Applies to State Employees and State Police.)
3. Effective July 1, 1999, state employees, teachers and employees of participating local units that had not elected out of this benefit may retire with an unreduced benefit if they are at least 50 years old and they have earned at least 30 years of service.

#### 1999 Valuation

1. 100% Joint and Survivor Option is payable in the case of death of a member who dies while in active service.
2. 100% Joint and Survivor Option is payable for disability retirement.



## Schedule G – Summary of Plan Changes

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### **2000 Valuation**

1. On October 1, 1999, the Virginia Law Officers' Retirement System (VaLORS) became effective.
2. The Board of Trustees adopted the use of a "pooled" contribution rate for State Employees and Teachers.

### **2001 Valuation**

1. The State Police System had their temporary supplement starting at retirement extended from age 65 to their Social Security Retirement Age.
2. VaLORS changed their benefit multiplier from 1.70% to 2.00% of pay with no temporary supplement for all new hires and rehires after July 1, 2001 as well as for current participants who have made an election to change formulas.
3. The Partial Lump Sum Option was added as an additional optional form of payment. This option provides the retiring member with a lump sum payment equal to the sum of 12, 24, or 36 payments of the standard monthly life annuity. The member's monthly annuity is actuarially reduced to reflect the lump sum payment.

### **2003 Valuation**

No actuarially material changes were made to the plan provisions. Listed below are the two minor changes of note.

1. School superintendents with five years of service may now purchase an additional ten years of out-of-state service. The superintendent must not be eligible for an out-of-state benefit.
2. The leveling option was restored as an optional form of payment. Benefits may be leveled to age 62 or older, and the benefit cannot reduce more than 50%. Any COLAs are calculated on the basic benefit amount.

### **2007 Valuation**

The State Police changed their benefit multiplier from 1.70% to 1.85% of pay.



## Schedule G – Summary of Plan Changes

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### **2011 Valuation**

In 2010, VRS adopted a second retirement plan. All employees hired on or after July 1, 2010 are automatically enrolled in this plan. The differences between Plan 1 and Plan 2 are listed below:

1. The Average Final Compensation is now based on the highest 60 consecutive months of service.
2. The Cost of Living Adjustment was adjusted to be the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 10%, with the maximum cost-of-living increases of 6%.
3. The Normal Retirement Age is Social Security Normal Retirement Age plus five years of service. A member is eligible for unreduced early retirement when the sum of his or her age plus years of service is 90 (Rule of 90). Eligibility for reduced early retirement is at age 60 with five years of service.
4. Judges service weight has been changed. For first term judges less than age 45 the service weight is 1.5; for judges age 45 – 54 the service weight is 2.0; finally, for judges age 55 and above the service weight is 2.5.

The State Employees Plan and the Teachers Plan adopted changes 1, 2, and 3 listed above. The State Police Plan and the Virginia Law Officers Plan adopted changes 1 and 2 listed above. The Judicial Plan adopted changes 1, 2, and 4

### **2012 Valuation**

In, 2012 HB 1130 / SB 498 was enacted and will go into effect on January 1, 2013. A summary of this bill is listed below:

1. Active non-vested members in Plan 1 will have their Average Final Compensation based on the highest 60 consecutive months of service instead of the highest 36 consecutive months of service. This provision applies to all plans.
2. Active non-vested members in Plan 1 and all Plan 2 members will accrue benefits at 1.65% as of the effective date. This provision applies only to the State and Teacher Plans as well as members in political subdivision plans not covered by hazardous duty benefits members.
3. Active members in the Judicial plan hired after January 1, 2013 will accrue benefits at 1.65%.
4. Active non-vested members in Plan 1 will now have to satisfy the Rule of 90 (sum of age and service at least 90) or reach their Social Security Normal Retirement Age to be eligible for Unreduced Retirement. These same members must attain age 60 with five years of service to be eligible for Early Retirement. This provision applies only to the State and Teachers Plans as well as members in political subdivision plans not covered by hazardous duty benefits members.



## Schedule G – Summary of Plan Changes

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5. Active non-vested members in Plan 1 and all Plan 2 members will only be able to receive a maximum COLA of 3%. This provision applies to all plans.
6. All active employees not within five years of eligibility for unreduced retirement as of January 1, 2013 and retiring with less than 20 years of service will have their COLA deferred to one year after their unreduced retirement date after beginning to receive benefits. All active employees within five years of eligibility for unreduced retirement as of January 1, 2013 are grandfathered into the old provisions with no deferral of the COLA.

### **2014 Valuation**

The 2014 valuation includes Hybrid Plan members for the first time. The Hybrid Plan covers eligible employees hired on or after January 1, 2014 in the State, Teachers and Judicial plans. The Hybrid Plan does not apply to members in the State Police and VaLORS plans. The Hybrid Plan consists of defined benefit plan and defined contribution plan components.

#### Defined benefit plan component

The benefits under the defined benefit plan are similar to Plan 2 benefits except that the benefit accrual rate is 1.00% under the Hybrid Plan.

#### Defined contribution plan component

Active members in the Hybrid Plan are required to contribute 1% of their creditable compensation per year to the defined contribution component of the Hybrid Plan. Active members can make voluntary additional contributions of up to 4% of their creditable compensation. The maximum employee contribution is 5% of pay.

Employers are also required to contribute 1% of pay to the defined contribution component for members in the Hybrid Plan. In addition, employers match the employee's first 1% of voluntary contributions and 0.5% match for each additional 1% of voluntary employee contributions. The maximum employer contribution is 3.5% of pay of members in the defined contribution component of the Hybrid Plan.

### **2015 Valuation**

The mandatory retirement age for Judges was increased from age 70 to age 73.



Schedule H – Schedules of Active Member Data

STATE EMPLOYEES  
As of June 30, 2021

Attained Age	Completed Years of Service								Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+			
Under 20	53	0	0	0	0	0	0	53	\$ 1,584,947	
20 to 24	1,613	12	0	0	0	0	0	1,625	\$ 62,611,428	
25 to 29	4,508	546	3	0	0	0	0	5,057	\$ 233,043,384	
30 to 34	4,497	2,233	329	10	0	0	0	7,069	\$ 377,960,647	
35 to 39	3,751	2,478	1,385	457	5	0	0	8,076	\$ 486,013,030	
40 to 44	3,143	2,189	1,550	1,155	374	12	0	8,423	\$ 536,841,939	
45 to 49	2,672	1,932	1,487	1,272	974	260	8	8,605	\$ 564,495,474	
50 to 54	2,665	1,883	1,561	1,543	1,291	864	449	10,256	\$ 676,467,799	
55 to 59	2,098	1,759	1,505	1,417	1,431	1,009	1,639	10,858	\$ 712,200,198	
60	349	282	308	310	278	185	419	2,131	\$ 139,248,005	
61	294	262	255	305	235	187	451	1,989	\$ 130,070,829	
62	244	243	229	237	234	185	412	1,784	\$ 121,181,065	
63	183	237	230	210	219	145	359	1,583	\$ 107,750,404	
64	132	195	217	210	194	141	427	1,516	\$ 105,208,241	
65	127	145	155	162	124	112	276	1,101	\$ 75,164,649	
66	83	124	127	97	103	63	232	829	\$ 57,883,295	
67	58	85	86	97	79	53	161	619	\$ 45,626,514	
68	50	54	74	76	55	45	151	505	\$ 36,997,553	
69	28	45	46	55	41	31	118	364	\$ 26,453,958	
70 & Over	99	122	145	173	167	107	430	1,243	\$ 97,543,836	
Total	26,647	14,826	9,692	7,786	5,804	3,399	5,532	73,686	\$ 4,594,347,195	

Average Age: 47.83

Average Service: 11.48



*Schedule H – Schedules of Active Member Data*

**TEACHERS**  
**As of June 30, 2021**

Attained Age	Completed Years of Service								Total	Payroll*
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+			
Under 20	41	0	0	0	0	0	0	0	41	\$ 806,685
20 to 24	3,894	5	0	0	0	0	0	0	3,899	\$ 159,945,895
25 to 29	11,169	3,352	4	0	0	0	0	0	14,525	\$ 689,296,964
30 to 34	6,339	8,664	2,031	4	0	0	0	0	17,038	\$ 887,534,153
35 to 39	4,833	4,627	6,146	2,529	5	0	0	0	18,140	\$ 1,022,398,142
40 to 44	4,574	3,692	3,503	6,317	1,771	6	0	0	19,863	\$ 1,185,205,720
45 to 49	4,202	3,555	3,032	3,940	4,881	1,149	2	0	20,761	\$ 1,277,044,544
50 to 54	3,630	3,567	3,279	3,822	3,660	3,605	878	0	22,441	\$ 1,399,589,537
55 to 59	2,400	2,423	2,733	3,442	2,768	1,795	1,847	0	17,408	\$ 1,034,080,449
60	348	362	451	592	546	311	361	0	2,971	\$ 172,055,503
61	296	303	383	570	537	251	367	0	2,707	\$ 156,035,510
62	263	261	322	471	410	231	310	0	2,268	\$ 130,049,162
63	195	217	275	427	343	262	245	0	1,964	\$ 114,827,085
64	173	176	221	302	337	195	241	0	1,645	\$ 94,696,044
65	113	133	136	198	195	132	179	0	1,086	\$ 63,766,510
66	76	95	94	138	127	80	121	0	731	\$ 42,572,956
67	66	67	78	109	99	63	77	0	559	\$ 31,861,445
68	59	59	57	71	85	56	68	0	455	\$ 26,151,565
69	51	52	44	68	54	24	59	0	352	\$ 19,076,913
70 & Over	130	114	116	171	140	69	199	0	939	\$ 50,002,334
Total	42,852	31,724	22,905	23,171	15,958	8,229	4,954	0	149,793	\$ 8,556,997,116

Average Age: 44.98

Average Service: 11.73

\* Actual annual compensation provided by VRS.



Schedule H – Schedules of Active Member Data

**STATE POLICE**  
**As of June 30, 2021**

Attained Age	Completed Years of Service								Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total	
Under 20	0	0	0	0	0	0	0	0	\$ -
20 to 24	140	0	0	0	0	0	0	140	\$ 7,117,111
25 to 29	220	52	0	0	0	0	0	272	\$ 15,219,306
30 to 34	94	165	42	0	0	0	0	301	\$ 18,249,198
35 to 39	40	65	101	78	0	0	0	284	\$ 19,685,110
40 to 44	20	22	40	138	42	0	0	262	\$ 19,918,559
45 to 49	10	20	17	73	124	27	0	271	\$ 22,657,646
50 to 54	6	12	15	40	50	60	29	212	\$ 19,085,136
55 to 59	3	5	17	12	11	19	69	136	\$ 13,388,355
60	0	1	2	1	3	1	17	25	\$ 2,620,378
61	0	1	0	1	2	2	6	12	\$ 1,284,478
62	0	1	0	0	3	0	4	8	\$ 795,009
63	0	0	0	0	1	1	8	10	\$ 1,145,667
64	0	0	0	0	0	1	4	5	\$ 578,448
65	0	0	0	0	0	0	0	0	\$ -
66	0	0	0	1	0	0	4	5	\$ 548,417
67	0	0	0	0	0	0	1	1	\$ 168,068
68	0	0	0	0	0	0	2	2	\$ 219,737
69	0	0	0	0	0	0	1	1	\$ 114,839
70 & Over	0	0	0	0	0	0	0	0	\$ -
<b>Total</b>	<b>533</b>	<b>344</b>	<b>234</b>	<b>344</b>	<b>236</b>	<b>111</b>	<b>145</b>	<b>1,947</b>	<b>\$ 142,795,462</b>

Average Age: 40.26

Average Service: 13.38





Schedule H – Schedules of Active Member Data

JUDICIAL  
As of June 30, 2021

Attained Age	Completed Years of Service								Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+			
Under 20	0	0	0	0	0	0	0	0	0	\$ -
20 to 24	0	0	0	0	0	0	0	0	0	\$ -
25 to 29	0	0	0	0	0	0	0	0	0	\$ -
30 to 34	0	0	0	0	0	0	0	0	0	\$ -
35 to 39	6	1	0	0	0	0	0	0	7	\$ 1,185,946
40 to 44	21	9	0	0	0	0	0	0	30	\$ 5,150,997
45 to 49	25	17	3	0	0	0	0	0	45	\$ 7,758,451
50 to 54	30	32	9	4	1	0	0	0	76	\$ 13,078,838
55 to 59	24	27	14	13	3	0	0	0	81	\$ 14,166,117
60	3	7	1	2	1	2	0	0	16	\$ 2,863,254
61	8	8	2	5	0	1	0	0	24	\$ 4,201,724
62	3	8	4	3	4	1	0	0	23	\$ 3,968,186
63	7	5	2	3	2	0	0	0	19	\$ 3,318,545
64	1	8	3	6	1	2	0	0	21	\$ 3,729,470
65	1	9	2	4	4	0	0	0	20	\$ 3,581,559
66	5	6	4	3	1	0	1	0	20	\$ 3,549,831
67	2	5	1	2	2	2	0	0	14	\$ 2,437,014
68	2	2	1	4	2	3	2	0	16	\$ 2,843,154
69	2	5	2	1	1	4	2	0	17	\$ 3,009,318
70 & Over	0	7	3	2	7	4	1	0	24	\$ 4,282,687
Total	140	156	51	52	29	19	6	0	453	\$ 79,125,091

Average Age: 58.22

Average Service: 9.36



Schedule H – Schedules of Active Member Data

**VIRGINIA LAW OFFICERS  
As of June 30, 2021**

Attained Age	Completed Years of Service							Total	Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+		
Under 20	56	0	0	0	0	0	0	56	\$ 1,991,218
20 to 24	727	7	0	0	0	0	0	734	\$ 27,959,916
25 to 29	1,002	188	1	0	0	0	0	1,191	\$ 48,281,153
30 to 34	724	355	80	3	0	0	0	1,162	\$ 48,988,298
35 to 39	403	228	237	87	0	0	0	955	\$ 43,115,688
40 to 44	272	185	162	180	84	0	0	883	\$ 41,077,111
45 to 49	198	150	176	189	223	85	1	1,022	\$ 49,920,678
50 to 54	164	112	145	173	125	75	9	803	\$ 39,238,713
55 to 59	121	78	127	149	72	47	26	620	\$ 30,660,632
60	13	11	20	16	14	5	4	83	\$ 4,023,150
61	13	11	18	14	8	4	1	69	\$ 3,194,752
62	7	6	18	11	7	3	2	54	\$ 2,612,819
63	10	4	15	13	8	2	3	55	\$ 2,675,285
64	3	5	11	4	10	4	6	43	\$ 2,389,687
65	2	2	5	8	2	1	3	23	\$ 1,187,225
66	3	3	1	5	3	1	2	18	\$ 912,399
67	2	3	4	4	3	1	2	19	\$ 1,131,382
68	0	2	0	2	1	3	0	8	\$ 433,722
69	1	1	0	5	0	1	1	9	\$ 468,665
70 & Over	4	0	3	3	2	2	2	16	\$ 823,583
Total	3,725	1,351	1,023	866	562	234	62	7,823	\$ 351,086,076

Average Age: 40.05

Average Service: 8.44



Schedule I – Schedules of Retiree and Beneficiary Data

**RETIREE AND BENEFICIARY DATA**  
As of June 30, 2021

Employer	Prior Year Total Retirees and Beneficiaries	Retirees and Beneficiaries		Current Year Total Retirees and Beneficiaries	Current Annual Allowances (000s)	Prior Annual Allowances (000s)	% Increase in Annual Allowances	Average Annual Allowances	Prior Year Average Annual Allowances	% Increase in Average Annual Allowances
		Added	Removed							
State	60,069	3,318	2,286	61,101	\$ 1,472,727	\$ 1,425,109	3.3%	\$ 24,103	\$ 23,725	1.6%
Teachers	97,403	5,631	2,494	100,540	2,562,291	2,465,245	3.9%	25,485	25,310	0.7%
Political	58,589	4,292	2,144	60,737	1,229,724	1,155,556	6.4%	20,247	19,723	2.7%
Total VRS	216,061	13,241	6,924	222,378	\$ 5,264,742	\$ 5,045,910	4.3%	\$ 23,675	\$ 23,354	1.4%
State Police	1,481	110	37	1,554	68,652	63,771	7.7%	44,178	43,059	2.6%
VaLORS	5,261	366	117	5,510	124,807	116,615	7.0%	22,651	22,166	2.2%
Judicial	553	35	27	561	46,397	45,412	2.2%	82,704	82,119	0.7%
Totals	223,356	13,752	7,105	230,003	\$ 5,504,598	\$ 5,271,708	4.4%	\$ 23,933	\$ 23,602	1.4%

**CHANGE IN ALLOWANCES FOR RETIREES AND BENEFICIARIES**  
As of June 30, 2021

Employer	Prior Year Annual Allowances	COLA	Additions	Deletions	Current Year Annual Allowances
State	\$ 1,425,109	\$ 17,529	\$ 80,754	\$ 50,665	\$ 1,472,727
Teachers	2,465,245	30,323	130,102	63,379	2,562,291
Political	1,155,556	14,213	92,357	32,402	1,229,724
Total VRS	\$ 5,045,910	\$ 62,065	\$ 303,213	\$ 146,446	\$ 5,264,742
State Police	63,771	784	5,454	1,357	68,652
VaLORS	116,615	1,434	9,887	3,129	124,807
Judicial	45,412	559	2,542	2,116	46,397
Totals	\$ 5,271,708	\$ 64,842	\$ 321,096	\$ 153,048	\$ 5,504,598