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Virginia
Retirement
System

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

Prepared as of June 30, 2017





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

December 20, 2017

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, 2017.

- 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, 2017. 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, 2017 and to recommend rates of contribution. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The asset values used to determine unfunded liabilities are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts using the market value of assets would be different. 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 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. We also present the expected employer contributions to be actually funded based on the percentage of the full rate adopted by the General Assembly. For comparison, in the table below we present the employer contribution rates for fiscal years ending 2019 and 2020 based on the June 30, 2017 actuarial valuation and the employer contribution rates approved by the General Assembly for fiscal years ending 2017 and 2018. Contribution rates for VRS employers are established every two years. The actuarially calculated employer contribution rates based on the June 30, 2016 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 2017/2018		Informational Only	Fiscal Years 2019/2020		
	Board Approved	General Assembly Approved	Total Employer Rate for Retirement Plans	Full Employer Rate for Defined Benefit Plan	Employer Rate for Hybrid DC Component	Total Employer Rate for Retirement Plans
	2015 Valuation		2016 Valuation	2017 Valuation		
State	14.46%	13.49%	13.17%	12.94%	0.58%	13.52%
Teachers	16.32%	14.66%/16.32%	15.86%	15.24%	0.44%	15.68%
SPORS	28.99%	28.54%	27.78%	24.88%	N/A	24.88%
ValORS	22.21%	21.05%	20.44%	21.61%	N/A	21.61%
JRS	45.15%	41.97%	38.45%	33.21%	1.18%	34.39%
Political Subdivisions (Average rates)	8.15%	N/A	7.70%	7.12%	0.48%	7.60%

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. 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 26-year period and changes in the unfunded accrued liability since June 30, 2013 are 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.

The assumptions recommended by the actuary and adopted by the Board are in the aggregate reasonably related to the experience under the Fund and to reasonable expectations of anticipated experience under the Fund. The valuation reflects changes in the actuarial assumptions adopted by the Board of Trustees recommended in the experience study of VRS for the four-year period ending June 30, 2016. The table below summarizes the changes in actuarial assumptions. In addition to the assumption changes listed below, 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.



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 year age and service 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 year age and service 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 year age and service 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

We have prepared several supporting schedules shown in the actuarial section of the Comprehensive Annual Financial Report, including the Schedule of Active Member Data and the Analysis of Financial Experience. For completeness, the table of Changes in Unfunded Actuarial Accrued Liabilities in Section VI 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.



December 20, 2017
The Board of Trustees
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This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with the Actuarial Standards of Practice issued by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the 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.

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 that reads "Jose I. Fernandez".

Jose I. Fernandez, ASA, FCA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in blue ink that reads "Larry Langer".

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

A handwritten signature in blue ink that reads "John Garrett".

John Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

A handwritten signature in blue ink that reads "Micki R. Taylor".

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



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Section I – Summary of Principal Results

1. 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 below. In addition, we present a summary of the valuation results for the political subdivisions.

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

VALUATION DATE	June 30, 2017	June 30, 2016
Members:		
Active	74,807	74,968
Long Term Disability	2,198	2,267
Retirees and Beneficiaries	63,180	61,404
Inactive, Vested	12,618	12,232
Inactive, Non-Vested	25,730	26,258
Inactive, active elsewhere in VRS	<u>9,089</u>	<u>8,967</u>
Total	187,622	186,096
Annual Covered Payroll	\$ 4,037,072	\$ 4,002,477
Annual Retirement Benefits	\$ 1,223,849	\$ 1,172,004
Total Assets:		
Actuarial Value	\$ 17,547,764	\$ 16,672,776
Market Value	17,789,888	16,367,842
Actuarial Accrued Liability	\$ 23,311,534	\$ 22,878,243
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>5,763,770</u>	<u>6,205,467</u>
Total UAAL	\$ 5,763,770	\$ 6,205,467
RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING	2019 & 2020	For Informational Purposes
Employer Contribution Rate Defined Benefit Plan:		
Normal Cost (net of employee contributions)	4.61 %	3.95 %
Administrative Expense	0.29 %	0.26 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>8.04 %</u>	<u>8.76 %</u>
Annual Recommended Contribution	12.94 %	12.97 %
Employer Contribution Rate Defined Contribution	<u>0.58 %</u>	<u>0.20 %</u>
Total Employer Contribution Rate Retirement Plans	13.52 %	13.17 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	17-26	18-27
Effective Amortization Period Total UAAL	29.6	29.5



Section I – Summary of Principal Results

TEACHERS
(\$ IN THOUSANDS)

VALUATION DATE	June 30, 2017	June 30, 2016
Members:		
Active	150,416	149,018
Long Term Disability	0	1
Retirees and Beneficiaries	91,737	88,563
Inactive, Vested	23,150	22,081
Inactive, Non-Vested	31,163	31,146
Inactive, active elsewhere in VRS	<u>5,452</u>	<u>5,375</u>
Total	301,918	296,184
Annual Covered Payroll	\$ 7,919,450	\$ 7,666,824
Annual Retirement Benefits	\$ 2,090,205	\$ 2,000,999
Total Assets:		
Actuarial Value	\$ 32,684,868	\$ 30,768,277
Market Value	33,119,545	30,168,211
Actuarial Accrued Liability	\$ 45,006,017	\$ 43,581,629
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 222,583	\$ 269,435
Balance of UAAL	<u>12,098,566</u>	<u>12,543,917</u>
Total UAAL	\$ 12,321,149	\$ 12,813,352
RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING	2019 & 2020	For Informational Purposes
Employer Contribution Rate Defined Benefit Plan:		
Normal Cost (net of employee contributions)	5.96 %	5.43 %
Administrative Expense	0.26 %	0.25 %
Amortization of Deferred Contributions	0.75 %	0.82 %
Amortization of Balance of UAAL	<u>8.27 %</u>	<u>9.22 %</u>
Annual Recommended Contribution	15.24 %	15.72 %
Employer Contribution Rate Defined Contribution	<u>0.44 %</u>	<u>0.14 %</u>
Total Employer Contribution Rate Retirement Plans	15.68 %	15.86 %
Amortization Period (Years):		
Deferred Contributions	4	5
Balance of UAAL	17-26	18-27
Effective Amortization Period Total UAAL	25.8	26.4



Section I – Summary of Principal Results

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

VALUATION DATE	June 30, 2017	June 30, 2016
Members:		
Active	1,882	1,940
Long-Term Disability	13	15
Retirees and Beneficiaries	1,507	1,433
Inactive, Vested	146	135
Inactive, Non-Vested	210	210
Inactive, active elsewhere in VRS	<u>245</u>	<u>238</u>
Total	4,003	3,971
Annual Covered Payroll	\$ 110,265	\$ 114,877
Annual Retirement Benefits	\$ 55,248	\$ 51,432
Total Assets:		
Actuarial Value	\$ 785,677	\$ 744,656
Market Value	796,073	730,688
Actuarial Accrued Liability	\$ 1,040,628	\$ 1,081,980
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>254,951</u>	<u>337,324</u>
Total UAAL	\$ 254,951	\$ 337,324
RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING	2019 & 2020	For Informational Purposes
Employer Contribution Rate:		
Normal Cost (net of employee contributions)	11.78 %	10.66 %
Administrative Expense	0.86 %	0.52 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>12.24 %</u>	<u>16.60 %</u>
Annual Recommended Contribution	24.88 %	27.78 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	17-26	18-27
Effective Amortization Period Total UAAL	33.4	29.4



Section I – Summary of Principal Results

JUDICIAL
(\$ IN THOUSANDS)

VALUATION DATE	June 30, 2017	June 30, 2016
Members:		
Active	421	416
Retirees and Beneficiaries	538	535
Inactive, Vested	5	6
Inactive, Non-Vested	0	0
Inactive, active elsewhere in VRS	<u>3</u>	<u>3</u>
Total	967	960
Annual Covered Payroll	\$ 66,288	\$ 65,524
Annual Retirement Benefits	\$ 40,657	\$ 39,788
Total Assets:		
Actuarial Value	\$ 505,834	\$ 476,321
Market Value	512,749	467,389
Actuarial Accrued Liability	\$ 631,522	\$ 607,798
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>125,688</u>	<u>131,477</u>
Total UAAL	\$ 125,688	\$ 131,477
RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING	2019 & 2020	For Informational Purposes
Employer Contribution Rate:		
Normal Cost (net of employee contributions)	23.00 %	27.39 %
Administrative Expense	0.91 %	0.56 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>9.30 %</u>	<u>9.99 %</u>
Annual Recommended Contribution	33.21 %	37.94 %
Employer Contribution Rate Defined Contribution	<u>1.18 %</u>	<u>0.51 %</u>
Total Employer Contribution Rate Retirement	34.39 %	38.45 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	17-26	18-27
Effective Amortization Period Total UAAL	39.4	38.0



Section I – Summary of Principal Results

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

VALUATION DATE	June 30, 2017	June 30, 2016
Members:		
Active	8,718	9,106
Long Term Disability	583	581
Retirees and Beneficiaries	4,813	4,457
Inactive, Vested	1,020	955
Inactive, Non-Vested	4,744	4,341
Inactive, active elsewhere in VRS	<u>2,760</u>	<u>2,639</u>
Total	22,638	22,079
Annual Covered Payroll	\$ 339,150	\$ 352,677
Annual Retirement Benefits	\$ 95,607	\$ 89,700
Total Assets:		
Actuarial Value	\$ 1,328,178	\$ 1,235,490
Market Value	1,345,887	1,211,446
Actuarial Accrued Liability	\$ 1,977,781	\$ 1,984,257
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 0
Balance of UAAL	<u>649,603</u>	<u>748,767</u>
Total UAAL	\$ 649,603	\$ 748,767
RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING	2019 & 2020	For Informational Purposes
Employer Contribution Rate:		
Normal Cost (net of employee contributions)	10.07 %	7.75 %
Administrative Expense	0.46 %	0.27 %
Amortization of Deferred Contributions	0.00 %	0.00 %
Amortization of Balance of UAAL	<u>11.08 %</u>	<u>12.42 %</u>
Annual Recommended Contribution	21.61 %	20.44 %
Amortization Period (Years):		
Deferred Contributions	0	0
Balance of UAAL	17-26	18-27
Effective Amortization Period Total UAAL	28.2	27.7



Section I – Summary of Principal Results

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

VALUATION DATE	June 30, 2017	June 30, 2016
Number of Political Subdivisions in VRS	589	585
Members:		
Active	107,315	106,271
Long Term Disability	5	0
Retirees and Beneficiaries*	66,553	63,050
Inactive, Vested*	16,487	15,834
Inactive, Non-Vested*	31,930	31,769
Inactive, active elsewhere in VRS	<u>31,172</u>	<u>30,128</u>
Total	253,462	247,052
Annual Covered Payroll	\$ 4,808,354	\$ 4,656,697
Annual Retirement Benefits	\$927,567	\$ 860,954
Total Assets:**		
Actuarial Value	\$ 18,981,614	\$ 17,762,683
Market Value	19,250,247	17,418,106
Actuarial Accrued Liability**	\$ 21,533,733	\$ 20,659,120
Unfunded Actuarial Accrued Liability (UAAL)**	2,552,119	2,896,437
	For Informational Purposes	For Informational Purposes
Average Employer Contribution Rate Defined Benefit Plan (<i>net of employee contributions</i>)	7.12 %	7.53 %
Average Employer Contribution Rate Defined Contribution Plan	<u>0.48 %</u>	<u>0.17 %</u>
Average Employer Contribution Rate Retirement Plans	7.60 %	7.70 %
Amortization Period (Years)	17-26	18-27
Effective Amortization Period Total UAAL	42.7	37.6

* 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 does not include counts for Political Subdivisions with no active members.

** Includes Political Subdivisions with no active members.



Section I – Summary of Principal Results

2. Comments on the valuation results as of June 30, 2017 are given in Section IV and further discussion of the contribution level for each plan is set out in Section V.

3. Schedule B shows the development of the actuarial value of assets. Schedule E and Schedule F of this report outline the full set of actuarial assumptions and methods used in the current valuation. The actuarial assumptions and methods reflect the changes adopted as a result of the experience study of VRS for the four-year period ending June 30, 2016.

4. The valuation takes into account the effect of amendments to VRS through the valuation date. The main provisions of VRS, as summarized in Schedule G, were taken into account in the current valuation.

5. 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. Below we provide an estimate of the deferred contributions as provided by VRS.

DIVISION	Deferred Contributions (\$ in thousands)	
	Outstanding Balance as of 6/30/2017	Outstanding Balance as of 6/30/2016
State Employees	\$ 0	\$ -
Teachers	222,583	269,435
State Police	0	0
Virginia Law Officers	0	0
Judicial	0	0
Total	\$ 222,583	\$ 269,435



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, 2017 on the basis of which the valuation was prepared.

TABLE 1
THE NUMBER AND ANNUAL COMPENSATION OF
ACTIVE MEMBERS AS OF JUNE 30, 2017
(\$ IN THOUSANDS)

DIVISION	NUMBER	COMPENSATION
State Employees	74,807	\$4,037,072
Teachers	150,416	8,303,502
State Police	1,882	110,265
Judicial	421	66,288
Virginia Law Officers	8,718	339,150
Political Subdivisions	<u>107,315</u>	<u>4,808,354</u>
Total	343,559	\$17,664,632

- 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
6/30/2017	343,559	\$ 17,664,632	\$ 51,417	4.22 %
6/30/2016	341,719	16,859,077	49,336	2.27 %
6/30/2015	340,048	16,404,201	48,241	1.37 %
6/30/2014	340,319	16,195,744	47,590	2.56 %
6/30/2013	340,032	15,777,349	46,400	2.54 %



Section II – Membership Data

- 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, 2017
(\$ IN THOUSANDS)**

TYPE OF RETIREMENT	DIVISION						TOTAL
	STATE EMPLOYEES	TEACHERS	STATE POLICE	JUDICIAL	VIRGINIA LAW OFFICERS	POLITICAL SUBDIVISIONS*	
Service:							
Number	54,436	84,232	1,110	400	4,286	54,111	198,575
Annual Benefits	\$1,097,414	\$1,951,320	\$45,171	\$34,109	\$89,575	\$764,431	\$3,982,020
Disability:							
Number	3,770	4,395	185	0	258	8,116	16,724
Annual Benefits	\$60,738	\$94,680	\$6,243	\$0	\$3,861	\$123,197	\$288,719
Survivors:							
Number	4,974	3,110	212	138	269	4,326	13,029
Annual Benefits	\$65,697	\$44,205	\$3,834	\$6,548	\$2,171	\$39,939	\$162,394
Total:							
Number	63,180	91,737	1,507	538	4,813	66,553	228,328
Annual Benefits	\$1,223,849	\$2,090,205	\$55,248	\$40,657	\$95,607	\$927,567	\$4,433,133

* 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 does not include counts for Political Subdivisions with no active members.

- 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, 2017, the market value of assets used to determine the actuarial value of assets for each division is shown below:

TABLE 4
COMPARISON OF MARKET VALUE OF ASSETS
(\$ IN THOUSANDS)

DIVISION	JUNE 30, 2017 MARKET VALUE	JUNE 30, 2016 MARKET VALUE
State Employees	\$17,789,888	\$16,367,842
Teachers	33,119,545	30,168,211
State Police	796,073	730,688
Judicial	512,749	467,389
Virginia Law Officers	1,345,887	1,211,446
Political Subdivisions	<u>19,250,247</u>	<u>17,418,106</u>
Total Market Value of Assets	\$72,814,389	\$66,363,682

- Schedule B shows the development of the actuarial value of assets as of June 30, 2017. The following table shows the actuarial value of assets allocated among all divisions.

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

DIVISION	JUNE 30, 2017 ACTUARIAL VALUE	JUNE 30, 2016 ACTUARIAL VALUE
State Employees	\$17,547,764	\$16,672,776
Teachers	32,684,868	30,768,277
State Police	785,677	744,656
Judicial	505,834	476,321
Virginia Law Officers	1,328,178	1,235,490
Political Subdivisions	<u>18,981,614</u>	<u>17,762,683</u>
Total Actuarial Value of Assets	\$71,833,935	\$67,660,203



Section IV – Comments on Valuation

State Employees

1. The total valuation balance sheet on account of benefits as of June 30, 2017 shows that the State Employees plan has total prospective benefit liabilities of \$25,951,153,739, of which \$13,052,108,838 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$1,096,760,870 is for the prospective benefits payable on account of present inactive members, and \$11,802,284,031 is for the prospective benefits payable on account of present active members. Against these benefit liabilities the State Employees plan has a total present actuarial value of assets of \$17,547,764,000 as of June 30, 2017. The difference of \$8,403,389,739 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future on account of benefits. Of this amount, \$1,349,822,151 is the present value of future contributions expected to be made by members (at the rate of 5% of salary for Plan 1 and Plan 2 members and 4% for Hybrid members) and the balance of \$7,053,567,588 represents the present value of future contributions payable by the employers.
2. The employers' contributions to the State Employees plan on account of retirement benefits consist of normal contributions and accrued liability contributions. The valuation indicates that employer normal contributions at the rate of 4.61% of salary are required. This is net of the 4.68% blended employee contribution rate. In addition, there is a required contribution rate of 0.29% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$1,289,798,043. When this amount is subtracted from \$7,053,567,588, which is the present value of the total future contributions to be made by the employers, there remains \$5,763,769,545 as the amount of future accrued liability contributions.
4. It is recommended that the accrued liability contribution rate payable by employers on account of retirement benefits be set at 8.04% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$5,763,769,545 on the assumption that the aggregate payroll for State employees will increase by 3% each year. See Schedule D for the amortization schedule for the unfunded accrued liability.
5. In addition, the employer makes a contribution to the defined contribution component of the Hybrid Plan. As of the valuation date the average employer defined contribution rate is 1.83% of pay for members in the Hybrid Plan. The employer defined contribution rate as a percent of the plan's total payroll is 0.58%.



Section IV – Comments on Valuation

Teachers

1. The total valuation balance sheet on account of benefits as of June 30, 2017 shows that the Teachers plan has total prospective benefit liabilities of \$52,537,333,903, of which \$24,312,263,410 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$1,162,271,879 is for the prospective benefits payable on account of present inactive members, and \$27,062,798,614 is for the prospective benefits payable on account of present active members. Against these benefit liabilities the Teachers plan has a total present actuarial value of assets of \$32,684,868,000 as of June 30, 2017. The difference of \$19,852,465,903 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future on account of benefits. Of this amount, \$3,414,424,716 is the present value of future contributions expected to be made by members (at the rate of 5% of salary for Plan 1 and Plan 2 members and 4% for Hybrid members) and the balance of \$16,438,041,188 represents the present value of future contributions payable by the employers.
2. The employers' contributions to the Teachers plan on account of retirement benefits consist of normal contributions and accrued liability contributions. The valuation indicates that employer normal contributions at the rate of 5.96% of salary are required. This is net of the 4.75% blended employee contribution rate. In addition, there is a required contribution rate of 0.26% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$4,116,891,903. When this amount is subtracted from \$16,438,041,188, which is the present value of the total future contributions to be made by the employers, there remains \$12,321,149,285 as the amount of future accrued liability contributions.
4. It is recommended that the accrued liability contribution rate payable by the employers on account of retirement benefits be set at 9.02% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$12,321,149,285 on the assumption that the aggregate payroll for Teachers will increase by 3% each year. See Schedule D for the amortization schedule for the unfunded accrued liability.
5. In addition, the employer makes a contribution to the defined contribution component of the Hybrid Plan. As of the valuation date the average employer defined contribution rate is 1.76% of pay for members in the Hybrid Plan. The employer defined contribution rate as a percent of the plan's total payroll is 0.44%.



Section IV – Comments on Valuation

State Police (SPORS)

1. The total valuation balance sheet on account of benefits as of June 30, 2017 shows that the SPORS plan has total prospective benefit liabilities of \$1,204,852,967, of which \$599,620,898 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$22,584,976 is for the prospective benefits payable on account of present inactive members, and \$582,647,093 is for the prospective benefits payable on account of present active members. Against these benefit liabilities SPORS has a total present actuarial value of assets of \$785,677,000 as of June 30, 2017. The difference of \$419,175,967 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future on account of benefits. Of this amount, \$49,991,192 is the present value of future contributions expected to be made by members (at the rate of 5% of salary) and the balance of \$369,184,775 represents the present value of future contributions payable by the employers.
2. The employers' contributions to SPORS on account of retirement benefits consist of normal contributions and accrued liability contributions. The valuation indicates that employer normal contributions at the rate of 11.78% of salary are required. This is net of the 5% employee contribution rate. In addition, there is a required contribution rate of 0.86% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$114,234,076. When this amount is subtracted from \$369,184,775, which is the present value of the total future contributions to be made by the employers, there remains \$254,950,699 as the amount of future accrued liability contributions.
4. It is recommended that the accrued liability contribution rate payable by the employers on account of retirement benefits be set at 12.24% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$254,950,699 on the assumption that the aggregate payroll for SPORS employees will increase by 3% each year. See Schedule D for the amortization schedule for the unfunded accrued liability.



Section IV – Comments on Valuation

Judicial

1. The total valuation balance sheet on account of benefits as of June 30, 2017 shows that the Judicial plan has total prospective benefit liabilities of \$749,630,241, of which \$406,030,945 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$1,831,212 is for the prospective benefits payable on account of present inactive members, and \$341,768,084 is for the prospective benefits payable on account of present active members. Against these benefit liabilities the Judicial plan has a total present actuarial value of assets of \$505,834,000 as of June 30, 2017. The difference of \$243,796,241 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future on account of benefits. Of this amount, \$22,216,169 is the present value of future contributions expected to be made by members (at the rate of 5% of salary for Plan 1 and Plan 2 members and 4% for Hybrid members) and the balance of \$221,580,072 represents the present value of future contributions payable by the employers.
2. The employers' contributions to the Judicial plan on account of retirement benefits consist of normal contributions and accrued liability contributions. The valuation indicates that employer normal contributions at the rate of 23.00% of salary are required. This is net of the 4.60% employee contribution rate. In addition, there is a required contribution rate of 0.91% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$95,892,258. When this amount is subtracted from \$221,580,072, which is the present value of the total future contributions to be made by the employers, there remains \$125,687,814 as the amount of future accrued liability contributions.
4. It is recommended that the accrued liability contribution rate payable by employers on account of retirement benefits be set at 9.30% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$125,687,814 on the assumption that the aggregate payroll for Judicial employees will increase by 3% each year. See Schedule D for the amortization schedule for the unfunded accrued liability.
5. In addition, the employer makes a contribution to the defined contribution component of the Hybrid Plan. As of the valuation date the average employer defined contribution rate is 2.98% of pay for members in the Hybrid Plan. The employer defined contribution rate as a percent of the plan's total payroll is 1.18%.



Section IV – Comments on Valuation

Virginia Law Officers (VaLORS)

1. The total valuation balance sheet on account of benefits as of June 30, 2017 shows that VaLORS has total prospective benefit liabilities of \$2,242,841,364, of which \$1,055,083,959 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$164,589,158 is for the prospective benefits payable on account of present inactive members, and \$1,023,168,247 is for the prospective benefits payable on account of present active members. Against these benefit liabilities VaLORS has a total present actuarial value of assets of \$1,328,178,000 as of June 30, 2017. The difference of \$914,663,364 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future on account of benefits. Of this amount, \$92,544,809 is the present value of future contributions expected to be made by members (at the rate of 5% of salary) and the balance of \$822,118,555 represents the present value of future contributions payable by the employers.
2. The employers' contributions to VaLORS on account of retirement benefits consist of normal contributions and accrued liability contributions. The valuation indicates that employer normal contributions at the rate of 10.07% of salary are required. This is net of the 5% employee contribution rate. In addition, there is a required contribution rate of 0.46% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$172,515,372. When this amount is subtracted from \$822,118,555, which is the present value of the total future contributions to be made by the employers, there remains \$649,603,183 as the amount of future accrued liability contributions.
4. It is recommended that the accrued liability contribution rate payable by employers on account of retirement benefits be set at 11.08% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$649,603,183 on the assumption that the aggregate payroll for VaLORS employees will increase by 3% each year. See Schedule D for the amortization schedule for the unfunded accrued liability.



Section V – Contribution Rates

1. The actuarially determined employer contribution rates as a percent of payroll for each division based on the June 30, 2017 actuarial valuation are shown in the following table:

TABLE 6

Division	Employer Contribution Rate Defined Benefit Plan	Employer Contribution Rate Defined Contribution Plan	Employer Contribution Rate Retirement Plans
State Employees	12.94%	0.58%	13.52%
Teachers	15.24	0.44	15.68
State Police	24.88	N/A	24.88
Judicial	33.21	1.18	34.39
Virginia Law Officers	21.61	N/A	21.61

The rates shown are net of member contributions.



Section V – 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, 2017.

TABLE 7
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	6.29%	8.37%	12.82%	26.52%	8.21%
Disability Benefits	1.00%	0.61%	1.48%	0.00%	3.14%
Survivor Benefits	0.33%	0.19%	0.65%	1.08%	0.28%
Separation Benefits	<u>1.67%</u>	<u>1.53%</u>	<u>1.83%</u>	<u>0.00%</u>	<u>3.44%</u>
Total	9.29%	10.71%	16.78%	27.60%	15.07%
Member Current Contributions	<u>4.68%</u>	<u>4.75%</u>	<u>5.00%</u>	<u>4.60%</u>	<u>5.00%</u>
Employer Normal Cost	4.61%	5.96%	11.78%	23.00%	10.07%
Administrative Expense	0.29%	0.26%	0.86%	0.91%	0.46%
Amortization of UAAL (<i>net of deferred contributions</i>) *	8.04%	8.27%	12.24%	9.30%	11.08%
Amortization of Deferred Contributions *	0.00%	0.75%	0.00%	0.00%	0.00%
Actuarially Recommended Employer Defined Benefit Plan Contribution Rate to pay Normal Cost and amortize UAAL	12.94%	15.24%	24.88%	33.21%	21.61%
<u>Defined Contribution Hybrid Plan</u>	0.58%	0.44%	N/A	1.18%	N/A
Employer Contribution Rate for Retirement Plans	13.52%	15.68%	24.88%	34.39%	21.61%

* The amortization period of the unfunded less the deferred contribution begins at 30 years on 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 except for Teachers which is to be amortized using a level-dollar, closed, 10 year period. See Schedule D for the Amortization Schedules showing each base comprising the unfunded accrued liability.



Section VI – Derivation of Experience Gains and Losses

**CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITIES (UAAL)
DURING FISCAL YEAR 2017
(\$ IN THOUSANDS)**

	State Employees	Teachers	State Police	Judicial	Virginia Law Officers	Political Subdivisions	Total
A. Calculation of Expected Unfunded Actuarial Accrued Liability							
1. UAAL as of June 30, 2016	\$ 6,205,467	\$ 12,813,352	\$ 337,324	\$ 131,477	\$ 748,767	\$ 2,896,437	\$ 23,132,824
2. Normal Cost for previous year	346,014	776,145	17,645	20,695	44,102	506,162	1,710,763
3. Actual contributions during the year	(723,460)	(1,506,345)	(36,564)	(30,226)	(89,564)	(702,092)	(3,088,251)
4. Interest at previous year's rate of 0.07							
a. on UAAL	434,383	896,935	23,613	9,203	52,414	202,751	1,619,299
b. on normal cost	24,221	54,330	1,235	1,449	3,087	35,431	119,753
c. on contributions	(25,321)	(52,722)	(1,280)	(1,058)	(3,135)	(24,573)	(108,089)
d. total: (a)+(b)+(c)	\$ 433,283	\$ 898,543	\$ 23,568	\$ 9,594	\$ 52,366	\$ 213,609	\$ 1,630,963
5. Expected UAAL as of June 30, 2017 A1+A2+A3+A4	6,261,304	12,981,695	341,973	131,540	755,671	2,914,116	23,386,299
6. Actual UAAL as of June 30, 2017	5,763,770	12,321,149	254,951	125,688	649,603	2,552,119	21,667,280
7. Total Gain/(Loss): A5-A6	\$ 497,534	\$ 660,546	\$ 87,022	\$ 5,852	\$ 106,068	\$ 361,997	\$ 1,719,019
B. Calculation of Asset Gain/(Loss)							
1. Actuarial Value of Assets (AVA) as of June 30, 2016	\$16,672,776	\$ 30,768,277	\$ 744,656	\$ 476,321	\$ 1,235,490	\$ 17,762,683	\$67,660,203
2. Contributions during the year	\$ 723,460	\$ 1,506,345	\$ 36,564	\$ 30,226	\$ 89,564	\$ 702,092	\$ 3,088,251
3. Benefit payments during the year	(1,265,225)	(2,187,302)	(58,444)	(40,895)	(101,162)	(983,924)	(4,636,952)
4. Interest at previous year's rate of 0.07							
a. on AVA at beginning of year	\$ 1,167,094	\$ 2,153,779	\$ 52,126	\$ 33,342	\$ 86,484	\$ 1,243,388	\$ 4,736,213
b. on contributions	25,321	52,722	1,280	1,058	3,135	24,573	108,089
c. on benefit payments	(44,283)	(76,556)	(2,046)	(1,431)	(3,541)	(34,437)	(162,294)
d. total: (a)+(b)+(c)	\$ 1,148,132	\$ 2,129,945	\$ 51,360	\$ 32,969	\$ 86,078	\$ 1,233,524	\$ 4,682,008
5. Expected AVA as of June 30, 2017 B1+B2+B3+B4	17,279,143	32,217,265	774,136	498,621	1,309,970	18,714,375	70,793,510
6. Actual AVA as of June 30, 2017	17,547,764	32,684,868	785,677	505,834	1,328,178	18,981,614	71,833,935
7. Gain/(Loss) on assets: B6-B5	\$ 268,621	\$ 467,603	\$ 11,541	\$ 7,213	\$ 18,208	\$ 267,239	\$ 1,040,425
C. Calculation of Liability Gain/(Loss)							
1. Gain/(Loss) due to changes in actuarial assumptions	(62,301)	(104,288)	63,377	(19,589)	59,591	59,356	(3,854)
2. Gain/(Loss) due to plan amendments	0	0	0	0	0	(10,104)	(10,104)
3. Gain/(Loss) due to change in methods	0	0	0	0	0	0	0
4. Liability Experience Gain/(Loss): A7-B7-C1-C2-C3	\$ 291,214	\$ 297,231	\$ 12,104	\$ 18,228	\$ 28,269	\$ 45,506	\$ 692,553



Section VI – Derivation of Experience Gains and Losses

**GAINS & LOSSES
DURING FISCAL YEAR 2017
(\$ IN MILLIONS)**

Type of Activity	State Employees	Teachers	State Police	Judges	Virginia Law Officers	Political Subdivisions
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	\$9.0	\$82.6	\$2.4	\$6.2	(\$11.6)	(\$32.6)
Disability Before Retirement. If disability claims are less than assumed, there is a gain. If more claims, a loss.	(\$2.9)	(\$1.5)	(\$0.8)	\$0.7	(\$0.6)	(\$11.4)
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	\$1.1	(\$0.5)	(\$0.1)	\$0.2	\$0.4	\$1.7
Withdrawal from Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(\$37.3)	(\$116.5)	\$1.2	\$0.0	\$1.9	\$2.2
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	\$150.1	\$59.6	\$6.8	\$6.9	\$17.9	\$4.5
New Members. Additional unfunded accrued liability will produce a loss.	(\$3.5)	(\$23.6)	\$0.0	(\$0.6)	(\$0.7)	(\$12.2)
Death after Retirement. If retirees live longer than assumed, there is a loss. If not as long, a gain.	\$30.3	(\$9.5)	(\$1.4)	(\$1.4)	\$5.4	\$10.0
Data and Other Adjustments.	(\$14.6)	(\$2.2)	(\$1.1)	\$1.5	\$2.1	(\$32.9)
Benefit Payments. If benefit payments are greater than expected, there is a loss. If the benefits payments are less, a gain.	\$10.1	\$22.7	(\$1.7)	\$0.0	\$1.3	\$1.0
Cost of Living Allowance (COLA). If COLA is greater than expected, there is a loss. If COLA is less, a gain.	\$148.9	\$286.1	\$6.8	\$4.8	\$12.2	\$115.2
Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.	\$268.6	\$467.6	\$11.5	\$7.2	\$18.2	\$267.2
Gain or (Loss) During Year	\$559.8	\$764.8	\$23.6	\$25.5	\$46.5	\$312.7
Non-Recurring Items. Adjustments for plan amendments, assumption changes, etc.	(62.3)	(104.3)	63.4	(19.6)	59.6	\$49.3
Expected Contributions vs. Actual Contributions. 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.	(14.8)	(131.7)	(2.4)	1.3	(3.3)	\$29.0
Total Gain or (Loss) During Year	\$482.7	\$528.8	\$84.5	\$7.2	\$102.8	\$391.0



Schedule A – Valuation Balance Sheet

STATE EMPLOYEES
As of June 30, 2017

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets		\$ 17,547,764,000
Present value of future members' contributions		1,349,822,151
Present value of future employer contributions		
Normal contributions	\$ 1,289,798,043	
Unfunded accrued liability contributions	<u>5,763,769,545</u>	
Total prospective employer contributions		<u>7,053,567,588</u>
Total Present and Prospective Assets		<u>\$ 25,951,153,739</u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 13,052,108,838
Present value of prospective benefits payable on account of inactive members		1,096,760,870
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$10,559,710,827	
Disability retirement benefits	570,815,263	
Survivor benefits	300,941,858	
Separation benefits	<u>370,816,083</u>	
Total		<u>11,802,284,031</u>
Total Actuarial Liabilities		<u>\$ 25,951,153,739</u>



Schedule A – Valuation Balance Sheet

TEACHERS
As of June 30, 2017

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets		\$ 32,684,868,000
Present value of future members' contributions		3,414,424,716
Present value of future employer contributions		
Normal contributions	\$ 4,116,891,903	
Unfunded accrued liability contributions	<u>12,321,149,285</u>	
Total prospective employer contributions		<u>16,438,041,188</u>
Total Present and Prospective Assets		<u><u>\$ 52,537,333,903</u></u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 24,312,263,410
Present value of prospective benefits payable on account of inactive members		1,162,271,879
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 24,857,333,457	
Disability retirement benefits	811,270,040	
Survivor benefits	368,356,813	
Separation benefits	<u>1,025,838,304</u>	
Total		<u>27,062,798,614</u>
Total Actuarial Liabilities		<u><u>\$ 52,537,333,903</u></u>



Schedule A – Valuation Balance Sheet

STATE POLICE
As of June 30, 2017

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets		\$ 785,677,000
Present value of future members' contributions		49,991,192
Present value of future employer contributions		
Normal contributions	\$ 114,234,076	
Unfunded accrued liability contributions	<u>254,950,699</u>	
Total prospective employer contributions		<u>369,184,775</u>
Total Present and Prospective Assets		<u>\$ 1,204,852,967</u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 599,620,898
Present value of prospective benefits payable on account of inactive members		22,584,976
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 515,040,654	
Disability retirement benefits	27,097,192	
Survivor benefits	14,557,408	
Separation benefits	<u>25,951,839</u>	
Total		<u>582,647,093</u>
Total Actuarial Liabilities		<u>\$ 1,204,852,967</u>



Schedule A – Valuation Balance Sheet

JUDICIAL
As of June 30, 2017

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets	\$	505,834,000
Present value of future members' contributions		22,216,169
Present value of future employer contributions		
Normal contributions	\$	95,892,258
Unfunded accrued liability contributions		<u>125,687,814</u>
Total prospective employer contributions		<u>221,580,072</u>
Total Present and Prospective Assets	\$	<u><u>749,630,241</u></u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits	\$	406,030,945
Present value of prospective benefits payable on account of inactive members		1,831,212
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$	331,800,803
Disability retirement benefits		-
Survivor benefits		9,967,281
Separation benefits		<u>-</u>
Total		<u>341,768,084</u>
Total Actuarial Liabilities	\$	<u><u>749,630,241</u></u>



Schedule A – Valuation Balance Sheet

VIRGINIA LAW OFFICERS
As of June 30, 2017

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets		\$ 1,328,178,000
Present value of future members' contributions		92,544,809
Present value of future employer contributions		
Normal contributions	\$ 172,515,372	
Unfunded accrued liability contributions	<u>649,603,183</u>	
Total prospective employer contributions		<u>822,118,555</u>
Total Present and Prospective Assets		<u>\$ 2,242,841,364</u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 1,055,083,959
Present value of prospective benefits payable on account of inactive members		164,589,158
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 812,096,799	
Disability retirement benefits	91,737,973	
Survivor benefits	13,990,977	
Separation benefits	<u>105,342,498</u>	
Total		<u>1,023,168,247</u>
Total Actuarial Liabilities		<u>\$ 2,242,841,364</u>



Schedule A – Valuation Balance Sheet

POLITICAL SUBDIVISIONS

As of June 30, 2017

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets		\$ 18,981,614,000
Present value of future members' contributions		1,575,225,865
Present value of future employer contributions		
Normal contributions	\$ 2,305,915,711	
Unfunded accrued liability contributions	<u>2,552,119,410</u>	
Total prospective employer contributions		<u>4,858,035,121</u>
Total Present and Prospective Assets		<u><u>\$ 25,414,874,986</u></u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 10,311,987,164
Present value of prospective benefits payable on account of inactive members		1,312,214,127
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$11,799,787,922	
Disability retirement benefits	879,169,077	
Survivor benefits	287,968,209	
Separation benefits	<u>823,748,487</u>	
Total		<u>13,790,673,695</u>
Total Actuarial Liabilities		<u><u>\$ 25,414,874,986</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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$12,887,047	\$51,247,606	\$25,716,631	\$89,851,284	\$69,214,246	100.00%	100.00%	19.75%
6/30/2016	12,518,183	48,717,940	25,882,869	87,118,992	65,203,736	100.00	100.00	15.33
6/30/2015	12,176,530	46,783,519	25,751,093	84,711,142	62,083,601	100.00	100.00	12.13
6/30/2014	11,819,771	44,469,489	25,794,124	82,083,384	57,144,567	100.00	100.00	3.32
6/30/2013	11,420,836	42,383,697	25,273,058	79,077,591	52,124,581	100.00	96.00	0.00

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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$3,374,835	\$14,148,870	\$5,787,829	\$23,311,534	\$17,547,764	100.00%	100.00%	0.42%
6/30/2016	3,324,003	13,408,506	6,145,734	22,878,243	16,672,776	100.00	99.55	0.00
6/30/2015	3,267,188	12,960,842	6,063,528	22,291,558	15,881,597	100.00	97.33	0.00
6/30/2014	3,202,604	12,433,349	6,186,983	21,822,936	14,826,208	100.00	93.50	0.00
6/30/2013	3,113,926	11,954,023	6,000,702	21,068,651	13,714,404	100.00	88.70	0.00



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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$6,082,982	\$25,474,535	\$13,448,500	\$45,006,017	\$32,684,868	100.00%	100.00%	8.38%
6/30/2016	5,871,258	24,559,074	13,151,297	43,581,629	30,768,277	100.00	100.00	2.57
6/30/2015	5,679,555	23,776,912	13,107,711	42,564,178	29,441,485	100.00	99.94	0.00
6/30/2014	5,494,752	22,720,375	13,082,542	41,297,669	27,026,576	100.00	94.80	0.00
6/30/2013	5,310,701	21,627,490	12,914,143	39,852,334	24,724,679	100.00	89.80	0.00

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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$3,429,230	\$11,624,201	\$6,480,302	\$21,533,733	\$18,981,614	100.00%	100.00%	60.62%
6/30/2016	3,322,922	10,750,359	6,585,839	20,659,120	17,762,683	100.00	100.00	56.02
6/30/2015	3,229,787	10,045,765	6,579,854	19,855,406	16,760,519	100.00	100.00	52.96
6/30/2014	3,122,415	9,315,765	6,524,599	18,962,779	15,291,783	100.00	100.00	43.74
6/30/2013	2,996,209	8,802,184	6,358,213	18,156,606	13,685,498	100.00	100.00	29.68



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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$99,643	\$622,206	\$318,779	\$1,040,628	\$785,677	100.00%	100.00%	20.02%
6/30/2016	100,291	585,837	395,852	1,081,980	744,656	100.00	100.00	14.79
6/30/2015	95,394	586,984	368,323	1,050,701	710,864	100.00	100.00	7.73
6/30/2014	92,637	562,413	374,105	1,029,155	662,244	100.00	100.00	1.92
6/30/2013	88,814	548,115	359,761	996,690	591,983	100.00	91.80	0.00

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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$39,104	\$407,862	\$184,556	\$631,522	\$505,834	100.00%	100.00%	31.90%
6/30/2016	37,648	395,698	174,452	607,798	476,321	100.00	100.00	24.63
6/30/2015	36,784	390,690	172,914	600,388	442,250	100.00	100.00	8.55
6/30/2014	38,522	370,265	199,382	608,169	406,053	100.00	99.30	0.00
6/30/2013	38,439	360,470	191,717	590,626	368,671	100.00	91.60	0.00



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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$240,517	\$1,219,673	\$517,591	\$1,977,781	\$1,328,178	100.00%	89.18%	0.00%
6/30/2016	237,416	1,160,507	586,334	1,984,257	1,235,490	100.00	86.00	0.00
6/30/2015	232,824	1,088,742	585,155	1,906,721	1,155,767	100.00	84.77	0.00
6/30/2014	230,522	977,848	611,675	1,820,045	1,058,010	100.00	84.60	0.00
6/30/2013	223,467	916,886	601,757	1,742,110	941,933	100.00	78.40	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) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2017	\$13,266,311	\$53,497,347	\$26,737,557	\$93,501,215	\$71,833,935	100.00%	100.00%	18.96%
6/30/2016	12,893,538	50,859,982	27,039,507	90,793,027	67,660,203	100.00	100.00	14.45
6/30/2015	12,541,532	48,849,935	26,877,485	88,268,952	64,392,482	100.00	100.00	11.17
6/30/2014	12,181,452	46,380,015	26,979,286	85,540,753	59,270,874	100.00	100.00	2.63
6/30/2013	11,771,556	44,209,168	26,426,293	82,407,017	54,027,168	100.00	95.60	0.00



Schedule B – Development of Actuarial Value of Assets

STATE EMPLOYEES
For the Year Ending June 30, 2017
(\$ in thousands)

(1)	Actuarial Value Beginning of Year	\$	16,672,776
(2)	Market Value End of Year	\$	17,789,888
(3)	Market Value Beginning of Year	\$	16,367,842
(4)	Cash Flow		
	a. Contributions	\$	736,815
	b. Benefit Payments		(1,265,225)
	c. Administrative Expenses		(11,612)
	d. Miscellaneous revenue and expenses		(1,743)
	e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(541,765)
(5)	Investment Income		
	a. Market total: (2) – (3) – (4)e	\$	1,963,811
	b. Assumed Rate		7.00%
	c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	1,126,787
	d. Amount for Phased-in Recognition: (5)a – (5)c	\$	837,024
(6)	Phased-In Recognition of Investment Income		
	a. Current Year: 0.20 x (5)d	\$	167,405
	b. First Prior Year		(171,992)
	c. Second Prior Year		(79,389)
	d. Third Prior Year		247,257
	e. Fourth Prior Year		126,685
	f. Total Recognized Investment Gain	\$	289,966
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	17,547,764



Schedule B – Development of Actuarial Value of Assets

TEACHERS
For the Year Ending June 30, 2017
(\$ in thousands)

(1)	Actuarial Value Beginning of Year	\$	30,768,277
(2)	Market Value End of Year	\$	33,119,545
(3)	Market Value Beginning of Year	\$	30,168,211
(4)	Cash Flow		
	a. Contributions	\$	1,530,706
	b. Benefit Payments		(2,187,302)
	c. Administrative Expenses		(21,123)
	d. Miscellaneous revenue and expenses		(3,238)
	e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(680,957)
(5)	Investment Income		
	a. Market total: (2) – (3) – (4)e	\$	3,632,291
	b. Assumed Rate		7.00%
	c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	2,087,941
	d. Amount for Phased-in Recognition: (5)a – (5)c	\$	1,544,350
(6)	Phased-In Recognition of Investment Income		
	a. Current Year: 0.20 x (5)d	\$	308,870
	b. First Prior Year		(316,628)
	c. Second Prior Year		(147,364)
	d. Third Prior Year		443,811
	e. Fourth Prior Year		220,918
	f. Total Recognized Investment Gain	\$	509,607
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	32,684,868



Schedule B – Development of Actuarial Value of Assets

STATE POLICE
For the Year Ending June 30, 2017
(\$ in thousands)

(1)	Actuarial Value Beginning of Year	\$	744,656
(2)	Market Value End of Year	\$	796,073
(3)	Market Value Beginning of Year	\$	730,688
(4)	Cash Flow		
	a. Contributions	\$	37,589
	b. Benefit Payments		(58,444)
	c. Administrative Expenses		(926)
	d. Miscellaneous revenue and expenses		(99)
	e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(21,880)
(5)	Investment Income		
	a. Market total: (2) – (3) – (4)e	\$	87,265
	b. Assumed Rate		7.00%
	c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	50,382
	d. Amount for Phased-in Recognition: (5)a – (5)c	\$	36,883
(6)	Phased-In Recognition of Investment Income		
	a. Current Year: 0.20 x (5)d	\$	7,377
	b. First Prior Year		(7,633)
	c. Second Prior Year		(3,555)
	d. Third Prior Year		10,912
	e. Fourth Prior Year		5,418
	f. Total Recognized Investment Gain	\$	12,519
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	785,677



Schedule B – Development of Actuarial Value of Assets

JUDICIAL
For the Year Ending June 30, 2017
(\$ in thousands)

(1)	Actuarial Value Beginning of Year	\$	476,321
(2)	Market Value End of Year	\$	512,749
(3)	Market Value Beginning of Year	\$	467,389
(4)	Cash Flow		
	a. Contributions	\$	30,884
	b. Benefit Payments		(40,895)
	c. Administrative Expenses		(594)
	d. Miscellaneous revenue and expenses		(64)
	e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(10,669)
(5)	Investment Income		
	a. Market total: (2) – (3) – (4)e	\$	56,029
	b. Assumed Rate		7.00%
	c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	32,344
	d. Amount for Phased-in Recognition: (5)a – (5)c	\$	23,685
(6)	Phased-In Recognition of Investment Income		
	a. Current Year: 0.20 x (5)d	\$	4,737
	b. First Prior Year		(4,786)
	c. Second Prior Year		(2,198)
	d. Third Prior Year		6,720
	e. Fourth Prior Year		3,365
	f. Total Recognized Investment Gain	\$	7,838
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	505,834



Schedule B – Development of Actuarial Value of Assets

VIRGINIA LAW OFFICERS
For the Year Ending June 30, 2017
(\$ in thousands)

(1)	Actuarial Value Beginning of Year	\$	1,235,490
(2)	Market Value End of Year	\$	1,345,887
(3)	Market Value Beginning of Year	\$	1,211,446
(4)	Cash Flow		
	a. Contributions	\$	91,414
	b. Benefit Payments		(101,162)
	c. Administrative Expenses		(1,540)
	d. Miscellaneous revenue and expenses		(310)
	e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(11,598)
(5)	Investment Income		
	a. Market total: (2) – (3) – (4)e	\$	146,039
	b. Assumed Rate		7.00%
	c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	84,395
	d. Amount for Phased-in Recognition: (5)a – (5)c	\$	61,644
(6)	Phased-In Recognition of Investment Income		
	a. Current Year: 0.20 x (5)d	\$	12,329
	b. First Prior Year		(12,494)
	c. Second Prior Year		(5,716)
	d. Third Prior Year		17,316
	e. Fourth Prior Year		8,456
	f. Total Recognized Investment Gain	\$	19,891
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	1,328,178



Schedule B – Development of Actuarial Value of Assets

POLITICAL SUBDIVISIONS
For the Year Ending June 30, 2017
(\$ in thousands)

(1)	Actuarial Value Beginning of Year	\$	17,762,683
(2)	Market Value End of Year	\$	19,250,247
(3)	Market Value Beginning of Year	\$	17,418,106
(4)	Cash Flow		
	a. Contributions	\$	716,199
	b. Benefit Payments		(983,924)
	c. Administrative Expenses		(12,220)
	d. Miscellaneous revenue and expenses		(1,887)
	e. Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(281,832)
(5)	Investment Income		
	a. Market total: (2) – (3) – (4)e	\$	2,113,973
	b. Assumed Rate		7.00%
	c. Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	1,209,403
	d. Amount for Phased-in Recognition: (5)a – (5)c	\$	904,570
(6)	Phased-In Recognition of Investment Income		
	a. Current Year: 0.20 x (5)d	\$	180,914
	b. First Prior Year		(180,602)
	c. Second Prior Year		(81,957)
	d. Third Prior Year		250,697
	e. Fourth Prior Year		122,308
	f. Total Recognized Investment Gain	\$	291,360
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	18,981,614



Schedule C – Summary of Changes in Net Assets

STATE EMPLOYEES
For the Year Ending June 30, 2017
(\$ in thousands)

Additions for the Year

Contributions:	
Members	\$ 201,267
Members (paid by employer)	124
Employers	<u>535,424</u>
Total	\$ 736,815
Miscellaneous Revenue	(1,743)
Net Investment Income	<u>1,963,811</u>
TOTAL	\$ 2,698,883

Deductions for the Year

Benefit Payments	\$ 1,234,388
Refunds	30,837
Transfers	-
Administrative Expenses	<u>11,612</u>
TOTAL	\$ <u>1,276,837</u>

Excess of Additions Over Deductions \$ 1,422,046

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2016	\$ 16,367,842
Excess of Additions over Deductions	<u>1,422,046</u>
Market Value of Assets as of 6/30/2017*	<u>\$ 17,789,888</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, 2017
(\$ in thousands)

Additions for the Year

Contributions:	
Members	\$ 392,742
Members (paid by employer)	(12)
Employers	<u>1,137,976</u>
Total	\$ 1,530,706
Miscellaneous Revenue	(3,238)
Net Investment Income	<u>3,632,291</u>
TOTAL	\$ 5,159,759

Deductions for the Year

Benefit Payments	\$ 2,147,781
Refunds	39,521
Transfers	-
Administrative Expenses	<u>21,123</u>
TOTAL	\$ <u>2,208,425</u>

Excess of Additions Over Deductions \$ 2,951,334

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2016	\$ 30,168,211
Excess of Additions over Deductions	<u>2,951,334</u>
Market Value of Assets as of 6/30/2017*	<u>\$ 33,119,545</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, 2017
(\$ in thousands)

Additions for the Year

Contributions:		
Members	\$	5,701
Members (paid by employer)		-
Employers		<u>31,888</u>
Total	\$	37,589
Miscellaneous Revenue		(99)
Net Investment Income		<u>87,265</u>
TOTAL	\$	<u>124,755</u>

Deductions for the Year

Benefit Payments	\$	57,814
Refunds		630
Transfers		-
Administrative Expenses		<u>926</u>
TOTAL	\$	<u>59,370</u>

Excess of Additions Over Deductions \$ 65,385

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2016	\$	730,688
Excess of Additions over Deductions		<u>65,385</u>
Market Value of Assets as of 6/30/2017*	\$	<u>796,073</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, 2017
(\$ in thousands)

Additions for the Year

Contributions:		
Members	\$	1,063
Members (paid by employer)		2,209
Employers		<u>27,612</u>
Total	\$	30,884
Miscellaneous Revenue		(64)
Net Investment Income		<u>56,029</u>
TOTAL	\$	<u>86,849</u>

Deductions for the Year

Benefit Payments	\$	40,895
Refunds		-
Transfers		-
Administrative Expenses		<u>594</u>
TOTAL	\$	<u>41,489</u>

Excess of Additions Over Deductions \$ 45,360

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2016	\$	467,389
Excess of Additions over Deductions		<u>45,360</u>
Market Value of Assets as of 6/30/2017*	\$	<u>512,749</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, 2017
(\$ in thousands)

Additions for the Year

Contributions:	
Members	\$ 17,598
Members (paid by employer)	-
Employers	<u>73,816</u>
Total	\$ 91,414
Miscellaneous Revenue	(310)
Net Investment Income	<u>146,039</u>
TOTAL	\$ <u>237,143</u>

Deductions for the Year

Benefit Payments	\$ 96,224
Refunds	4,938
Transfers	-
Administrative Expenses	<u>1,540</u>
TOTAL	\$ <u>102,702</u>

Excess of Additions Over Deductions \$ 134,441

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2016	\$ 1,211,446
Excess of Additions over Deductions	<u>134,441</u>
Market Value of Assets as of 6/30/2017*	<u>\$ 1,345,887</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, 2017
(\$ in thousands)

Additions for the Year

Contributions:	
Members	\$ 238,633
Members (paid by employer)	3
Employers	<u>477,563</u>
Total	\$ 716,199
Miscellaneous Revenue	(1,887)
Net Investment Income	<u>2,113,973</u>
TOTAL	\$ 2,828,285

Deductions for the Year

Benefit Payments	\$ 941,856
Refunds	42,068
Transfers	-
Administrative Expenses	<u>12,220</u>
TOTAL	\$ <u>996,144</u>

Excess of Additions Over Deductions \$ 1,832,141

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2016	\$ 17,418,106
Excess of Additions over Deductions	<u>1,832,141</u>
Market Value of Assets as of 6/30/2017*	\$ 19,250,247

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



Schedule D – Amortization Schedules Unfunded Accrued Liability

STATE EMPLOYEES
As of June 30, 2017

Table with 7 columns: Description, Original Amount, Outstanding Balance as of June 30, 2016, BOY 2016/2017 Amortization Payment, Outstanding Balance as of June 30, 2017, BOY 2017/2018 Amortization Payment, Years Remaining June 30, 2017. Rows include 2013 Original Unfunded, 2014-2017 Experience (Gain) / Loss, and a Total row.

Table with 2 columns: Date, Projected Unfunded Liability. Rows show dates from June 30, 2017 to June 30, 2043 with corresponding liability values.



Schedule D – Amortization Schedules Unfunded Accrued Liability

TEACHERS
As of June 30, 2017

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2017</u>	<u>BOY 2017/2018 Amortization Payment</u>	<u>Years Remaining June 30, 2017</u>
2013 Original Unfunded	\$14,493,629,234	\$14,939,824,413	\$869,221,034	\$15,055,545,616	\$895,297,665	26 years
2014 Experience (Gain) / Loss	(\$958,176,017)	(\$946,084,095)	(\$71,260,953)	(\$936,060,762)	(\$73,398,782)	17 years
2015 Experience (Gain) / Loss	(\$1,043,509,874)	(\$1,038,282,522)	(\$75,346,949)	(\$1,030,341,063)	(\$77,607,357)	18 years
2016 Experience (Gain) / Loss	(\$411,540,187)	(\$411,540,187)	(\$28,849,888)	(\$409,478,620)	(\$29,715,385)	19 years
2017 Assumption Change	\$104,287,885			\$104,287,885	\$7,310,814	20 years
2017 Experience (Gain) / Loss	(\$685,386,348)			(\$685,386,348)	(\$48,047,117)	20 years
2011 10 Yr Payback of Contribution Deficit	\$741,432,106	\$269,434,778	\$61,413,678	\$222,582,577	\$61,413,678	4 years
Total		\$12,813,352,387	\$755,176,922	\$12,321,149,285	\$735,253,516	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2017	\$12,321,149,285
June 30, 2018	\$12,396,908,473
June 30, 2019	\$12,456,340,545
June 30, 2020	\$12,497,653,696
June 30, 2043	\$0



Schedule D – Amortization Schedules Unfunded Accrued Liability

STATE POLICE
As of June 30, 2017

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2017</u>	<u>BOY 2017/2018 Amortization Payment</u>	<u>Years Remaining June 30, 2017</u>
2013 Original Unfunded	\$385,000,723	\$396,853,204	\$23,089,505	\$399,927,158	\$23,782,190	26 years
2014 Experience (Gain) / Loss	(\$25,215,304)	(\$24,897,094)	(\$1,875,299)	(\$24,633,321)	(\$1,931,558)	17 years
2015 Experience (Gain) / Loss	(\$30,844,770)	(\$30,690,257)	(\$2,227,156)	(\$30,455,518)	(\$2,293,971)	18 years
2016 Experience (Gain) / Loss	(\$3,942,276)	(\$3,942,276)	(\$276,362)	(\$3,922,528)	(\$284,653)	19 years
2017 Assumption Change	(\$63,376,957)			(\$63,376,957)	(\$4,442,867)	20 years
2017 Experience (Gain) / Loss	(\$22,588,135)			(\$22,588,135)	(\$1,583,479)	20 years
Total		\$337,323,577	\$18,710,688	\$254,950,699	\$13,245,662	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2017	\$254,950,699
June 30, 2018	\$258,624,390
June 30, 2019	\$262,130,052
June 30, 2020	\$265,443,169
June 30, 2043	\$0



Schedule D – Amortization Schedules Unfunded Accrued Liability

JUDICIAL
As of June 30, 2017

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2017</u>	<u>BOY 2017/2018 Amortization Payment</u>	<u>Years Remaining June 30, 2017</u>
2013 Original Unfunded	\$209,625,821	\$216,079,280	\$12,571,811	\$217,752,992	\$12,948,966	26 years
2014 Experience (Gain) / Loss	(\$21,000,605)	(\$20,735,584)	(\$1,561,846)	(\$20,515,900)	(\$1,608,701)	17 years
2015 Experience (Gain) / Loss	(\$44,957,373)	(\$44,732,164)	(\$3,246,161)	(\$44,390,023)	(\$3,343,546)	18 years
2016 Experience (Gain) / Loss	(\$19,134,811)	(\$19,134,811)	(\$1,341,393)	(\$19,038,957)	(\$1,381,635)	19 years
2017 Assumption Change	\$19,588,792			\$19,588,792	\$1,373,218	20 years
2017 Experience (Gain) / Loss	(\$27,709,090)			(\$27,709,090)	(\$1,942,469)	20 years
Total		\$131,476,721	\$6,422,411	\$125,687,814	\$6,045,833	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2017	\$125,687,814
June 30, 2018	\$128,016,920
June 30, 2019	\$130,314,991
June 30, 2020	\$132,574,035
June 30, 2043	\$0



Schedule D – Amortization Schedules Unfunded Accrued Liability

VIRGINIA LAW OFFICERS
As of June 30, 2017

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2017</u>	<u>BOY 2017/2018 Amortization Payment</u>	<u>Years Remaining June 30, 2017</u>
2013 Original Unfunded	\$759,539,883	\$782,922,779	\$45,551,603	\$788,987,158	\$46,918,151	26 years
2014 Experience (Gain) / Loss	(\$27,744,710)	(\$27,394,580)	(\$2,063,415)	(\$27,104,347)	(\$2,125,317)	17 years
2015 Experience (Gain) / Loss	(\$16,540,081)	(\$16,457,225)	(\$1,194,282)	(\$16,331,349)	(\$1,230,110)	18 years
2016 Experience (Gain) / Loss	\$9,695,693	\$9,695,693	\$679,690	\$9,647,123	\$700,080	19 years
2017 Assumption Change	(\$59,590,715)			(\$59,590,715)	(\$4,177,442)	20 years
2017 Experience (Gain) / Loss	(\$46,004,687)			(\$46,004,687)	(\$3,225,032)	20 years
Total		\$748,766,667	\$42,973,596	\$649,603,183	\$36,860,330	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2017	\$649,603,183
June 30, 2018	\$655,634,853
June 30, 2019	\$660,905,523
June 30, 2020	\$665,326,426
June 30, 2043	\$0



Schedule E – Outline of Actuarial Assumptions and Methods

Assumptions and Methods which apply to all VRS Plans

Investment Return Rate:	7.00% 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.
Funding Period:	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 except for Teachers which is to be amortized using a level-dollar, closed 10 year period beginning June 30, 2011. 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.
Payroll Growth Rate:	3% 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.
Cost-of-living Increase:	2.5% 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 2.5% per annum compounded annually.
Percent Electing a Deferred Termination Benefit:	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.



Schedule E – Outline of Actuarial Assumptions and Methods

Marriage Assumption:	100% of active employees are assumed to be married, with males two years older than females.
Plan 1:	Members hired prior to July 1, 2010 and who were vested as of January 1, 2013.
Plan 2:	Members hired on or after July 1, 2010 but before January 1, 2014, 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.
Hybrid:	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.
Service Related Disability:	The service related disability benefits do not include an adjustment for Social Security or Worker's Compensation benefits.
Hazardous Duty Service:	The valuations of SPORS and VaLORS assume that all VRS service is hazardous duty service for purposes of determining eligibility for the temporary supplement.
Administrative Expenses:	The employer contribution rates include a rate for anticipated non-investment expenses.



Schedule E – State Employees’ Actuarial Assumptions and Methods

STATE EMPLOYEES

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older projected with Scale BB to 2020; males setback 1 year, 85% of rates; females setback 1 year

Post-Retirement:

RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older projected with Scale BB to 2020; males set forward 1 year; females setback 1 year with 1.5% increase compounded from ages 70 to 85

Post-Disablement:

RP-2014 Disabled Mortality Rates projected with Scale BB to 2020; males 115% of rates; females 130% of rates

State Employees Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00031	0.00044	0.00803	0.00016	0.00016	0.00285
25	0.00043	0.00045	0.00957	0.00017	0.00017	0.00304
30	0.00037	0.00046	0.00894	0.00020	0.00020	0.00383
35	0.00042	0.00053	0.01035	0.00027	0.00027	0.00503
40	0.00050	0.00066	0.01242	0.00036	0.00036	0.00696
45	0.00073	0.00107	0.01925	0.00058	0.00058	0.01155
50	0.00127	0.00431	0.02304	0.00098	0.00098	0.01520
55	0.00211	0.00599	0.02639	0.00151	0.00333	0.01827
60	0.00345	0.00789	0.02933	0.00214	0.00454	0.02081
65	0.00587	0.01102	0.03389	0.00315	0.00684	0.02522
70	0.00970	0.01677	0.04238	0.00527	0.01104	0.03410
75		0.02704	0.05702		0.01930	0.04963
80		0.04548	0.08047		0.03437	0.07380
85		0.07920	0.11900		0.06378	0.10933
90		0.14247	0.18618		0.11280	0.16137

25% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale BB.



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	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.033	0.033	0.125	0.125
51	0.000	0.000	0.000	0.033	0.030	0.080	0.090
52	0.000	0.000	0.000	0.033	0.030	0.080	0.090
53	0.000	0.000	0.000	0.033	0.030	0.050	0.090
54	0.000	0.000	0.000	0.033	0.030	0.050	0.090
55	0.000	0.045	0.045	0.045	0.035	0.050	0.090
56	0.000	0.045	0.040	0.040	0.040	0.050	0.090
57	0.000	0.045	0.040	0.040	0.040	0.075	0.090
58	0.000	0.045	0.040	0.040	0.040	0.100	0.090
59	0.000	0.045	0.040	0.040	0.040	0.100	0.090
60	0.000	0.045	0.050	0.050	0.050	0.115	0.090
61	0.000	0.150	0.075	0.075	0.075	0.165	0.150
62	0.000	0.150	0.100	0.100	0.100	0.200	0.200
63	0.000	0.150	0.100	0.100	0.100	0.200	0.175
64	0.000	0.150	0.135	0.135	0.135	0.200	0.175
65	0.000	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.275	0.250	0.250	0.250	0.250	0.250
67	0.000	0.275	0.220	0.220	0.220	0.220	0.220
68	0.000	0.200	0.220	0.220	0.220	0.220	0.220
69	0.000	0.200	0.220	0.220	0.220	0.220	0.220
70	0.000	0.200	0.220	0.220	0.220	0.220	0.220
71	0.000	0.200	0.220	0.220	0.220	0.220	0.220
72	0.000	0.200	0.220	0.220	0.220	0.220	0.220
73	0.000	0.200	0.220	0.220	0.220	0.220	0.220
74	0.000	0.200	0.220	0.220	0.220	0.220	0.220
>=75	0.000	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 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	0.075	0.075
51	0.000	0.000	0.000	0.035	0.030	0.075	0.060
52	0.000	0.000	0.000	0.035	0.030	0.075	0.060
53	0.000	0.000	0.000	0.035	0.035	0.100	0.090
54	0.000	0.000	0.000	0.050	0.035	0.100	0.090
55	0.000	0.050	0.050	0.050	0.040	0.100	0.090
56	0.000	0.050	0.050	0.050	0.050	0.100	0.090
57	0.000	0.050	0.050	0.050	0.050	0.100	0.090
58	0.000	0.050	0.050	0.050	0.050	0.100	0.090
59	0.000	0.050	0.050	0.050	0.050	0.100	0.090
60	0.000	0.050	0.050	0.050	0.050	0.120	0.125
61	0.000	0.075	0.080	0.080	0.080	0.165	0.175
62	0.000	0.100	0.120	0.120	0.120	0.225	0.250
63	0.000	0.175	0.120	0.120	0.120	0.225	0.175
64	0.000	0.175	0.150	0.150	0.150	0.225	0.175
65	0.000	0.275	0.275	0.275	0.275	0.275	0.300
66	0.000	0.300	0.300	0.300	0.300	0.300	0.300
67	0.000	0.300	0.250	0.250	0.250	0.250	0.250
68	0.000	0.250	0.250	0.250	0.250	0.250	0.250
69	0.000	0.250	0.250	0.250	0.250	0.250	0.250
70	0.000	0.250	0.250	0.250	0.250	0.250	0.250
71	0.000	0.250	0.250	0.250	0.250	0.250	0.250
72	0.000	0.250	0.250	0.250	0.250	0.250	0.250
73	0.000	0.250	0.250	0.250	0.250	0.250	0.250
74	0.000	0.250	0.250	0.250	0.250	0.250	0.250
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



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	6-25	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
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	0.125
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
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	0.090
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	0.050	0.050	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	0.050	0.050	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	0.050	0.050	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	0.050	0.050	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	0.075	0.075	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	0.100	0.100	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	0.100	0.100	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
60	0.000	0.045	0.045	0.045	0.045	0.045	0.045	0.115	0.115	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
61	0.000	0.150	0.075	0.075	0.075	0.075	0.165	0.165	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
62	0.000	0.150	0.100	0.100	0.100	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
63	0.000	0.150	0.100	0.100	0.200	0.200	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
64	0.000	0.150	0.135	0.200	0.200	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
65	0.000	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	0.250	0.250	0.250
66	0.000	0.275	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	0.250	0.250
67	0.000	0.275	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
68	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
69	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
70	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
71	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
72	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
73	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
74	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
>=75	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



Schedule E – State Employees’ Actuarial Assumptions and Methods

State Employees Retirement Rates, Plan 2 and Hybrid Female																		
Age	Years of service																	
	0-4	5	6-25	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
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	0.075
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	0.075	0.075
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	0.075	0.075	0.060
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	0.100	0.100	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	0.100	0.100	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	0.100	0.100	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	0.100	0.100	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	0.100	0.100	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	0.100	0.100	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	0.100	0.100	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
60	0.000	0.050	0.050	0.050	0.050	0.050	0.050	0.120	0.120	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
61	0.000	0.075	0.080	0.080	0.080	0.080	0.165	0.165	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
62	0.000	0.100	0.120	0.120	0.120	0.225	0.225	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
63	0.000	0.175	0.120	0.120	0.225	0.225	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
64	0.000	0.175	0.150	0.225	0.225	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
65	0.000	0.275	0.275	0.275	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
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
67	0.000	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	0.250	0.250
68	0.000	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	0.250	0.250	0.250
69	0.000	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	0.250	0.250	0.250
70	0.000	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	0.250	0.250	0.250
71	0.000	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	0.250	0.250	0.250
72	0.000	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	0.250	0.250	0.250
73	0.000	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	0.250	0.250	0.250
74	0.000	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	0.250	0.250	0.250
>=75	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



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 Employees Termination Rates, Male											
Age	Years of service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.25852	0.25852	0.25694	0.23691	0.19663	0.15321	0.11602	0.09132	0.08331	0.08331	0.08331
25	0.22297	0.22297	0.22056	0.20171	0.16921	0.13670	0.10954	0.09132	0.08251	0.07732	0.07214
30	0.17601	0.17601	0.17095	0.15425	0.13244	0.11401	0.10011	0.08993	0.08095	0.06790	0.05485
35	0.15120	0.14553	0.13631	0.12195	0.10694	0.09577	0.08902	0.08387	0.07574	0.05878	0.04183
40	0.14480	0.12618	0.11198	0.09890	0.08767	0.08029	0.07681	0.07442	0.06799	0.04938	0.03077
45	0.14223	0.11470	0.09617	0.08321	0.07345	0.06888	0.06600	0.06412	0.05934	0.04282	0.02630
50	0.13789	0.10668	0.08617	0.07370	0.06544	0.06362	0.05994	0.05630	0.05128	0.03879	0.02630
55	0.13242	0.10032	0.08050	0.07094	0.06491	0.06348	0.05950	0.05391	0.04470	0.03550	0.02630
60	0.13038	0.09617	0.07857	0.07094	0.06491	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.13038	0.09477	0.07859	0.07094	0.06491	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.13038	0.09477	0.07859	0.07094	0.06491	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

State Employees Termination Rates, Female											
Age	Years of service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.31434	0.31434	0.30334	0.27392	0.23350	0.18606	0.14708	0.12545	0.12362	0.12362	0.12362
25	0.26747	0.26747	0.25594	0.23170	0.20061	0.16601	0.13663	0.11705	0.11136	0.11136	0.11136
30	0.21874	0.20726	0.19398	0.17630	0.15700	0.13853	0.12163	0.10538	0.09500	0.09045	0.09045
35	0.19257	0.17078	0.15532	0.14101	0.12758	0.11658	0.10633	0.09380	0.08241	0.07177	0.06019
40	0.17770	0.14790	0.12987	0.11685	0.10577	0.09775	0.09030	0.08135	0.07188	0.05904	0.03747
45	0.17029	0.13335	0.11247	0.09984	0.08920	0.08275	0.07531	0.06872	0.06277	0.05214	0.03025
50	0.16721	0.12286	0.09934	0.08763	0.07822	0.07316	0.06479	0.05936	0.05545	0.05088	0.03025
55	0.16695	0.11694	0.09149	0.08236	0.07660	0.07039	0.06175	0.05711	0.05138	0.05088	0.03025
60	0.16695	0.11656	0.09060	0.08236	0.07660	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.16695	0.11656	0.09060	0.08236	0.07660	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.16695	0.11656	0.09060	0.08236	0.07660	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 of 1.83% for members in the Hybrid Plan as reported by VRS.



Schedule E – Teachers Actuarial Assumptions and Methods

TEACHERS

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

RP-2014 White Collar Employee Rates to age 80, White Collar Healthy Annuitant Rates at ages 81 and older projected with Scale BB to 2020

Post-Retirement:

RP-2014 White Collar Employee Rates to age 49, White Collar Healthy Annuitant Rates at ages 50 and older projected with Scale BB to 2020; males 1% increase compounded from ages 70 to 90; females setback 3 years with 1.5% increase compounded from ages 65 to 70 and 2.0% increase compounded from ages 75 to 90

Post-Disablement:

RP-2014 Disabled Mortality Rates projected with Scale BB to 2020; 115% of rates for males and females

Teachers Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00028	0.00028	0.00803	0.00014	0.00015	0.00252
25	0.00033	0.00033	0.00957	0.00014	0.00014	0.00269
30	0.00031	0.00031	0.00894	0.00018	0.00016	0.00339
35	0.00036	0.00036	0.01035	0.00024	0.00020	0.00445
40	0.00043	0.00043	0.01242	0.00033	0.00026	0.00616
45	0.00067	0.00067	0.01925	0.00054	0.00040	0.01022
50	0.00116	0.00272	0.02304	0.00091	0.00068	0.01345
55	0.00192	0.00384	0.02639	0.00137	0.00225	0.01616
60	0.00315	0.00501	0.02933	0.00194	0.00297	0.01841
65	0.00540	0.00705	0.03389	0.00290	0.00460	0.02231
70	0.00939	0.01144	0.04238	0.00505	0.00804	0.03017
75		0.02063	0.05702		0.01419	0.04390
80		0.03801	0.08047		0.02649	0.06529
85		0.07325	0.11900		0.05139	0.09672
90		0.14553	0.18618		0.10307	0.14275

5% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale BB.



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 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	0.020	0.020	0.175	0.175
51	0.000	0.000	0.000	0.020	0.020	0.175	0.150
52	0.000	0.000	0.000	0.020	0.020	0.175	0.150
53	0.000	0.000	0.000	0.020	0.020	0.175	0.150
54	0.000	0.000	0.000	0.040	0.035	0.175	0.150
55	0.000	0.070	0.070	0.070	0.045	0.225	0.150
56	0.000	0.070	0.045	0.045	0.045	0.225	0.150
57	0.000	0.070	0.045	0.045	0.045	0.225	0.150
58	0.000	0.070	0.060	0.060	0.060	0.225	0.150
59	0.000	0.100	0.060	0.060	0.060	0.225	0.150
60	0.000	0.100	0.070	0.070	0.070	0.225	0.150
61	0.000	0.110	0.085	0.085	0.085	0.300	0.250
62	0.000	0.170	0.150	0.150	0.150	0.350	0.350
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	0.350
66	0.000	0.275	0.350	0.350	0.350	0.350	0.350
67	0.000	0.300	0.350	0.350	0.350	0.350	0.350
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	0.300	0.300	0.300	0.300	0.300
73	0.000	0.300	0.300	0.300	0.300	0.300	0.300
74	0.000	0.300	0.300	0.300	0.300	0.300	0.300
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule E – Teachers Actuarial Assumptions and Methods

Teachers 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	0.024	0.024	0.150	0.150
51	0.000	0.000	0.000	0.035	0.020	0.150	0.100
52	0.000	0.000	0.000	0.035	0.025	0.150	0.100
53	0.000	0.000	0.000	0.035	0.025	0.150	0.100
54	0.000	0.000	0.000	0.040	0.030	0.150	0.100
55	0.000	0.060	0.060	0.060	0.050	0.225	0.160
56	0.000	0.060	0.050	0.050	0.050	0.225	0.160
57	0.000	0.060	0.050	0.050	0.050	0.225	0.160
58	0.000	0.070	0.050	0.050	0.050	0.225	0.160
59	0.000	0.080	0.060	0.060	0.060	0.225	0.200
60	0.000	0.090	0.080	0.080	0.080	0.225	0.200
61	0.000	0.150	0.100	0.100	0.100	0.300	0.250
62	0.000	0.150	0.150	0.150	0.150	0.350	0.300
63	0.000	0.150	0.150	0.150	0.150	0.350	0.300
64	0.000	0.250	0.150	0.150	0.150	0.350	0.300
65	0.000	0.300	0.300	0.300	0.300	0.300	0.350
66	0.000	0.300	0.350	0.350	0.350	0.350	0.350
67	0.000	0.300	0.300	0.300	0.300	0.300	0.300
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	0.300	0.300	0.300	0.300	0.300
73	0.000	0.300	0.300	0.300	0.300	0.300	0.300
74	0.000	0.300	0.300	0.300	0.300	0.300	0.300
>=75	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 Retirement Rates, Plan 2 and Hybrid Male																		
Age	Years of service																	
	0-4	5	6-25	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
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	0.175
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	0.175	0.175
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	0.175	0.175	0.150
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	0.175	0.175	0.150	0.150
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	0.175	0.175	0.150	0.150	0.150
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	0.225	0.225	0.150	0.150	0.150	0.150
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
60	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
61	0.000	0.110	0.085	0.085	0.085	0.085	0.300	0.300	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
62	0.000	0.170	0.150	0.150	0.150	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
63	0.000	0.140	0.150	0.150	0.350	0.350	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
64	0.000	0.180	0.150	0.350	0.350	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
65	0.000	0.300	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
66	0.000	0.275	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
67	0.000	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
68	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
69	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
70	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
71	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
72	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
73	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
74	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
>=75	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



Schedule E – Teachers Actuarial Assumptions and Methods

Teachers Retirement Rates, Plan 2 and Hybrid Female																		
Age	Years of service																	
	0-4	5	6-25	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
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	0.150
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	0.150	0.150
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	0.150	0.150	0.100
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	0.150	0.150	0.100	0.100
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	0.150	0.150	0.100	0.100	0.100
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	0.225	0.225	0.160	0.160	0.160	0.160
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.160	0.160	0.160	0.160	0.160
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.160	0.160	0.160	0.160	0.160	0.160
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.160	0.160	0.160	0.160	0.160	0.160	0.160
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
60	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.225	0.225	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
61	0.000	0.150	0.100	0.100	0.100	0.100	0.300	0.300	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
62	0.000	0.150	0.150	0.150	0.150	0.350	0.350	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
63	0.000	0.150	0.150	0.150	0.350	0.350	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
64	0.000	0.250	0.150	0.350	0.350	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
65	0.000	0.300	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
66	0.000	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
67	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
68	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
69	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
70	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
71	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
72	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
73	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
74	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
>=75	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



Schedule E – Teachers’ Actuarial Assumptions and Methods

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	0.21079	0.14843	0.11901	0.11020	0.09349	0.08050	0.08046	0.07228	0.05097	0.04292	0.04292
25	0.18729	0.14293	0.12175	0.11084	0.09453	0.08071	0.07568	0.06716	0.05060	0.04286	0.04286
30	0.16964	0.13940	0.12584	0.11218	0.09637	0.08159	0.07055	0.06162	0.05134	0.04355	0.04355
35	0.16964	0.13888	0.12459	0.10907	0.09347	0.07931	0.06709	0.05881	0.05210	0.04361	0.03314
40	0.16964	0.13888	0.12078	0.10272	0.08688	0.07483	0.06444	0.05760	0.05255	0.04302	0.02407
45	0.16964	0.13888	0.11573	0.10116	0.07864	0.06940	0.06230	0.05733	0.05243	0.04239	0.02407
50	0.16964	0.13888	0.11233	0.10116	0.07206	0.06391	0.06033	0.05733	0.05234	0.04238	0.02407
55	0.16964	0.13888	0.11217	0.10116	0.07038	0.05844	0.05813	0.05733	0.05234	0.04238	0.02407
60	0.16964	0.13888	0.11217	0.10116	0.07038	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.16964	0.13888	0.11217	0.10116	0.07038	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.16964	0.13888	0.11217	0.10116	0.07038	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	0.18697	0.11393	0.09392	0.09392	0.08483	0.06269	0.04984	0.04984	0.04938	0.04663	0.04663
25	0.18037	0.12332	0.10860	0.10637	0.09381	0.07728	0.06567	0.06507	0.05448	0.04933	0.04933
30	0.17320	0.13889	0.12685	0.11780	0.10503	0.09536	0.08496	0.07332	0.06172	0.05303	0.04656
35	0.16500	0.14138	0.12602	0.11307	0.10178	0.09519	0.08653	0.07385	0.06386	0.05292	0.03931
40	0.15660	0.13208	0.11313	0.09891	0.08919	0.08395	0.07759	0.06810	0.06086	0.04911	0.02568
45	0.15055	0.12047	0.09933	0.08544	0.07686	0.07181	0.06623	0.05912	0.05390	0.04417	0.02287
50	0.14909	0.11617	0.09449	0.08038	0.07126	0.06481	0.05822	0.05346	0.04858	0.04357	0.02287
55	0.14909	0.11617	0.09449	0.08038	0.07093	0.06249	0.05450	0.05326	0.04771	0.04357	0.02287
60	0.14909	0.11617	0.09449	0.08038	0.07093	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.14909	0.11617	0.09449	0.08038	0.07093	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.14909	0.11617	0.09449	0.08038	0.07093	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Schedule E – Teachers’ 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	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 of 1.76% for members in the Hybrid Plan as reported by VRS.



Schedule E – State Police Actuarial Assumptions and Methods

STATE POLICE

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older projected with Scale BB to 2020; males 90% of rates; females set forward 1 year

Post-Retirement:

RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older projected with Scale BB to 2020; males set forward 1 year with 1.0% increase compounded from ages 70 to 90; females set forward 3 years

Post-Disablement:

RP-2014 Disabled Mortality Rates projected with Scale BB to 2020; males set forward 2 years; unisex using 100% male

SPORS Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00036	0.00044	0.00839	0.00016	0.00016	0.00839
25	0.00043	0.00045	0.00772	0.00018	0.00019	0.00772
30	0.00040	0.00046	0.00820	0.00023	0.00025	0.00820
35	0.00046	0.00053	0.00948	0.00030	0.00033	0.00948
40	0.00056	0.00066	0.01247	0.00043	0.00052	0.01247
45	0.00086	0.00107	0.01810	0.00072	0.00089	0.01810
50	0.00149	0.00431	0.02124	0.00118	0.00317	0.02124
55	0.00246	0.00599	0.02397	0.00174	0.00423	0.02397
60	0.00405	0.00789	0.02682	0.00247	0.00625	0.02682
65	0.00693	0.01102	0.03182	0.00383	0.00989	0.03182
70	0.01139	0.01694	0.04125	0.00653	0.01601	0.04125
75		0.02871	0.05658		0.02631	0.05658
80		0.05074	0.08141		0.04493	0.08141
85		0.09286	0.12299		0.07928	0.12299
90		0.17558	0.19143		0.14077	0.19143

85% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale BB.



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
<=49	0.000	0.000	0.000
50	0.000	0.100	0.100
51	0.000	0.030	0.100
52	0.000	0.030	0.100
53	0.000	0.030	0.100
54	0.000	0.030	0.100
55	0.000	0.060	0.100
56	0.000	0.060	0.100
57	0.000	0.060	0.100
58	0.000	0.100	0.100
59	0.000	0.100	0.100
60	0.000	0.100	0.100
61	0.000	0.100	0.100
62	0.000	0.200	0.200
63	0.000	0.200	0.200
64	0.000	0.200	0.200
>=65	0.000	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 age and years of service (for causes other than death, disability, or retirement).

SPORS Termination Rates	
Service	Unisex
0	0.09750
1	0.04750
2	0.04750
3	0.04750
4	0.04750
5	0.04750
6	0.04750
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:

RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older projected with Scale BB to 2020; males setback 1 year, 85% of rates; females setback 1 year

Post-Retirement:

RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older projected with Scale BB to 2020; males set forward 1 year; females setback 1 year with 1.5% compounding increase from ages 70 to 85

Post-Disablement:

RP-2014 Disabled Mortality Rates projected with Scale BB to 2020; males 115% of rates; females 130% of rates

Judicial Employees Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00031	0.00044	0.00803	0.00016	0.00016	0.00285
25	0.00043	0.00045	0.00957	0.00017	0.00017	0.00304
30	0.00037	0.00046	0.00894	0.00020	0.00020	0.00383
35	0.00042	0.00053	0.01035	0.00027	0.00027	0.00503
40	0.00050	0.00066	0.01242	0.00036	0.00036	0.00696
45	0.00073	0.00107	0.01925	0.00058	0.00058	0.01155
50	0.00127	0.00431	0.02304	0.00098	0.00098	0.01520
55	0.00211	0.00599	0.02639	0.00151	0.00333	0.01827
60	0.00345	0.00789	0.02933	0.00214	0.00454	0.02081
65	0.00587	0.01102	0.03389	0.00315	0.00684	0.02522
70	0.00970	0.01677	0.04238	0.00527	0.01104	0.03410
75		0.02704	0.05702		0.01930	0.04963
80		0.04548	0.08047		0.03437	0.07380
85		0.07920	0.11900		0.06378	0.10933
90		0.14247	0.18618		0.11280	0.16137

5% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale BB.



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	0.150
61	0.150
62	0.150
63	0.150
64	0.150
65	0.150
66	0.150
67	0.150
68	0.150
69	0.150
70	0.500
71	0.500
72	0.500
>=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 4.5%.

EMPLOYER CONTRIBUTION TO DEFINED CONTRIBUTION HYBRID PLAN: The valuation assumes an average employer defined contribution rate of 2.98% for members in the Hybrid Plan as reported by VRS.



Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods

VIRGINIA LAW OFFICERS

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older projected with Scale BB to 2020; males 90% of rates; females set forward 1 year

Post-Retirement:

RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older projected with Scale BB to 2020; males set forward 1 year with 1.0% increase compounded from ages 70 to 90; females set forward 3 years

Post-Disablement:

RP-2014 Disabled Mortality Rates projected with Scale BB to 2020; males set forward 2 years; unisex using 100% male

VaLORS Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00036	0.00044	0.00839	0.00016	0.00016	0.00839
25	0.00043	0.00045	0.00772	0.00018	0.00019	0.00772
30	0.00040	0.00046	0.00820	0.00023	0.00025	0.00820
35	0.00046	0.00053	0.00948	0.00030	0.00033	0.00948
40	0.00056	0.00066	0.01247	0.00043	0.00052	0.01247
45	0.00086	0.00107	0.01810	0.00072	0.00089	0.01810
50	0.00149	0.00431	0.02124	0.00118	0.00317	0.02124
55	0.00246	0.00599	0.02397	0.00174	0.00423	0.02397
60	0.00405	0.00789	0.02682	0.00247	0.00625	0.02682
65	0.00693	0.01102	0.03182	0.00383	0.00989	0.03182
70	0.01139	0.01694	0.04125	0.00653	0.01601	0.04125
75		0.02871	0.05658		0.02631	0.05658
80		0.05074	0.08141		0.04493	0.08141
85		0.09286	0.12299		0.07928	0.12299
90		0.17558	0.19143		0.14077	0.19143

35% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale BB.



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	0.110	0.110	0.350	0.350
51	0.000	0.100	0.080	0.300	0.250
52	0.000	0.100	0.080	0.300	0.250
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	0.200
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	0.200
61	0.000	0.180	0.200	0.200	0.200
62	0.000	0.180	0.400	0.400	0.400
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	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	0.100	0.100	0.375	0.375
51	0.000	0.100	0.080	0.250	0.200
52	0.000	0.100	0.080	0.250	0.200
53	0.000	0.100	0.080	0.250	0.225
54	0.000	0.100	0.080	0.250	0.250
55	0.000	0.100	0.080	0.250	0.275
56	0.000	0.100	0.080	0.250	0.300
57	0.000	0.100	0.080	0.250	0.225
58	0.000	0.100	0.080	0.400	0.225
59	0.000	0.100	0.130	0.300	0.225
60	0.000	0.200	0.200	0.200	0.225
61	0.000	0.200	0.225	0.225	0.225
62	0.000	0.200	0.300	0.300	0.300
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	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	0.31876	0.28460	0.25466	0.22550	0.19680	0.16134	0.13524	0.12367	0.12367	0.12367	0.12367
25	0.30264	0.26915	0.23838	0.20793	0.17797	0.14758	0.12544	0.11510	0.11510	0.11510	0.11510
30	0.28066	0.24612	0.21425	0.18325	0.15307	0.12980	0.11286	0.10375	0.10098	0.10098	0.10098
35	0.25749	0.21974	0.18823	0.16020	0.13400	0.11603	0.10242	0.09350	0.08615	0.07590	0.06050
40	0.23639	0.19311	0.16185	0.13861	0.11962	0.10471	0.09313	0.08358	0.07325	0.05907	0.04275
45	0.22182	0.17034	0.13792	0.12032	0.11173	0.09580	0.08484	0.07391	0.06240	0.05163	0.04275
50	0.21689	0.15441	0.11855	0.10683	0.10683	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.21689	0.14708	0.10525	0.09930	0.09930	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.21689	0.14673	0.09871	0.09787	0.09787	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.21689	0.14673	0.09796	0.09787	0.09787	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.21689	0.14673	0.09796	0.09787	0.09787	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	0.34816	0.33235	0.29905	0.25161	0.20346	0.15381	0.13567	0.10072	0.09919	0.09919	0.09919
25	0.33633	0.30645	0.27155	0.23161	0.19212	0.15381	0.13567	0.10072	0.09919	0.09919	0.09919
30	0.32698	0.27494	0.23556	0.20432	0.17667	0.15381	0.13567	0.10072	0.09919	0.09066	0.09066
35	0.32025	0.25204	0.20727	0.17948	0.15980	0.14868	0.13534	0.10072	0.09909	0.08073	0.06058
40	0.31390	0.23286	0.18182	0.15417	0.14036	0.13413	0.12530	0.10072	0.09311	0.07057	0.03901
45	0.30589	0.21487	0.15693	0.12720	0.11803	0.10976	0.10134	0.09113	0.07804	0.06036	0.03687
50	0.29483	0.19601	0.13051	0.09760	0.09281	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.28000	0.17544	0.10155	0.06516	0.06490	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.26118	0.15309	0.06978	0.02989	0.03440	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.23879	0.12934	0.03574	0.00004	0.00182	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.20897	0.10078	0.00000	0.00004	0.00000	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 year age and service 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 year age and service 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 year age and service 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 F – Actuarial Cost Method

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 7.00%). 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.
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.



Schedule G – Summary of Main Plan Provisions

Benefit Provisions which apply to all VRS Plans

Plan Year:	Twelve-month period ending June 30th.
Administration:	All plans are administered by the Board of Trustees of the Virginia Retirement System.
Plan 1:	Members hired prior to July 1, 2010 and who were vested as of January 1, 2013.
Plan 2:	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.
Hybrid:	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.
Eligibility:	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.
Employee Contributions:	
Defined Benefit -	Active members in Plan 1 and Plan 2 contribute 5.00% 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).
Defined Contribution -	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.
Creditable Compensation:	Annual salary minus any overtime pay, payments of a temporary nature, or payments for extra duties.



Schedule G – Summary of Main Plan Provisions

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

Effective Date:	March 1, 1952
Type of Plan:	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.
Service:	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 (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.
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:	
Plan 1:	Eligibility: A member may retire upon Normal Retirement on or after age 65 with credit for 5 years of service. Annual Benefit: 1.7% 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

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

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 1.7% 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.

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 Employees’ 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 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

11 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 5 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

TEACHERS
Plan Specific Benefit Provisions

Effective Date: March 1, 1952

Type of Plan: 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.

Service: 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 (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.

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:

Plan 1: Eligibility:

A member may retire upon Normal Retirement on or after age 65 with credit for 5 years of service.

Annual Benefit:

1.7% 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

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. The reduction is an actuarially equivalent factor. 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 1.7% 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 – Teachers’ 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 – 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.



Schedule G – Teachers’ Plan Provisions

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.

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.



Schedule G – Teachers’ Plan Provisions

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.

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).



Schedule G – Teachers’ Plan Provisions

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 5 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

STATE POLICE
Plan Specific Benefit Provisions

Effective Date: July 1, 1950

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

Service: 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 (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.

Average Final Compensation:

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.

Normal Retirement: Eligibility:

A member may retire upon Normal Retirement on or after age 60 with credit for 5 years of service.

Annual Benefit:

1.85% of average final compensation (AFC) times years of service. (Previously 1.7% of 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 Police Plan Provisions

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 \$13,584 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 \$13,584 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 1.7% 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

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

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 5 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

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 (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). 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 (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.



Schedule G – Judicial Plan Provisions

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 5 years of service. The mandatory retirement age for judges is age 73.

Annual Benefit:

1.7% 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 1.0%

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

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 1.7% of AFC times service credit (1.65% if appointed or elected on or after January 1, 2013 and 1.0% 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

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

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

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 5 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**

Effective Date:	October 1, 1999
Type of Plan:	VaLORS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.
Service:	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 (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.
Average Final Compensation:	
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.
Normal Retirement:	Eligibility: A member may retire upon Normal Retirement on or after age 60 with credit for 5 years of service. Annual Benefit: For all employees hired on or after July 1, 2001, the benefit is calculated as 2.0% 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) 1.7% of average final compensation (AFC) times years of service plus the temporary supplement described in 5(d). (ii) 2.0% 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 \$13,584 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 \$13,584 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 1.7% of AFC times service credit. Benefit is reduced by Worker's Compensation (if any).



Schedule G – Virginia Law Officers’ Plan Provisions

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.

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



Schedule G – Virginia Law Officers’ Plan Provisions

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.

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.



Schedule G – Virginia Law Officers’ Plan Provisions

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. 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



Schedule G – Virginia Law Officers’ Plan Provisions

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 5 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

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

2000 Valuation

1. On October 1, 1999, the Virginia Law Officers' Retirement System became effective.
2. On November 15, 2000 the VRS Board of Trustees adopted the recommended economic and demographic assumptions proposed by the actuary as a result of the June 2000 actuarial experience.
3. 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. The Virginia Law Officers System has changed their benefit multiplier from 1.7% to 2.0% 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.

2002 Valuation

No material changes were made to the plan provisions.

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.

2004 Valuation

No material changes were made to the plan provisions.

2005 Valuation

No material changes were made to the plan provisions.



Schedule G – Summary of Plan Changes

2006 Valuation

No material changes were made to the plan provisions.

2007 Valuation

The State Police changed their benefit multiplier from 1.7% to 1.85% of pay.

2008 Valuation

No material changes were made to the plan provisions.

2009 Valuation

The temporary retirement supplement for SPORS and VaLORS changed from \$11,508 to \$12,456.

2010 Valuation

No material changes were made to the plan provisions.

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



Schedule G – Summary of Plan Changes

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 5 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.
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 5 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 5 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% 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



Schedule G – Summary of Plan Changes

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 – Schedule of Active Member Data

**STATE EMPLOYEES
As of June 30, 2017**

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	59	0	0	0	0	0	0	59	\$ 1,423,836
20 to 24	1,626	11	0	0	0	0	0	1,637	\$ 52,988,148
25 to 29	4,668	538	18	0	0	0	0	5,224	\$ 206,750,172
30 to 34	4,208	1,946	604	10	0	0	0	6,768	\$ 315,852,869
35 to 39	3,482	2,028	1,600	401	11	0	0	7,522	\$ 386,462,492
40 to 44	2,835	1,900	1,672	1,054	268	6	0	7,735	\$ 419,730,144
45 to 49	2,628	1,873	1,925	1,526	977	437	32	9,398	\$ 520,231,263
50 to 54	2,395	1,827	1,850	1,633	1,172	1,329	741	10,947	\$ 611,841,469
55 to 59	1,795	1,616	1,825	1,651	1,114	1,468	2,054	11,523	\$ 652,626,599
60	273	288	339	306	217	272	543	2,238	\$ 132,092,237
61	249	258	337	274	220	253	502	2,093	\$ 121,646,140
62	231	248	295	257	197	212	486	1,926	\$ 113,989,941
63	170	172	250	270	174	182	436	1,654	\$ 101,895,385
64	125	186	238	225	154	188	434	1,550	\$ 95,029,526
65	77	128	155	181	119	123	324	1,107	\$ 70,715,459
66	72	131	120	132	108	91	237	891	\$ 56,294,153
67	52	60	99	101	57	68	179	616	\$ 40,635,600
68	32	54	78	69	42	59	131	465	\$ 31,753,124
69	23	39	67	55	31	38	114	367	\$ 25,468,817
70 & Over	56	94	139	157	101	110	430	1,087	\$ 79,644,853
Total	25,056	13,397	11,611	8,302	4,962	4,836	6,643	74,807	\$ 4,037,072,227

Average Age: 48.14

Average Service: 12.31



Schedule H – Schedule of Active Member Data

TEACHERS
As of June 30, 2017

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	22	0	0	0	0	0	0	22	\$ 574,422	
20 to 24	3,681	8	0	0	0	0	0	3,689	\$ 146,646,326	
25 to 29	12,099	3,338	11	0	0	0	0	15,448	\$ 690,535,319	
30 to 34	6,212	7,667	3,060	12	0	0	0	16,951	\$ 820,086,005	
35 to 39	4,642	3,943	7,482	2,215	4	0	0	18,286	\$ 950,656,784	
40 to 44	4,206	3,238	4,433	5,343	1,291	4	0	18,515	\$ 1,001,777,861	
45 to 49	4,311	3,657	4,382	4,194	4,094	1,293	10	21,941	\$ 1,217,689,641	
50 to 54	3,172	3,054	4,288	3,564	2,296	2,806	940	20,120	\$ 1,099,064,923	
55 to 59	2,017	2,186	3,691	3,607	2,193	1,893	2,498	18,085	\$ 994,506,253	
60	263	325	535	682	447	369	562	3,183	\$ 179,340,761	
61	230	256	479	574	404	366	474	2,783	\$ 156,488,247	
62	175	215	414	554	378	334	497	2,567	\$ 149,494,918	
63	158	167	391	455	333	307	335	2,146	\$ 127,155,569	
64	116	169	276	379	302	267	357	1,866	\$ 110,564,721	
65	99	116	271	309	218	190	298	1,501	\$ 88,281,504	
66	69	94	165	190	143	133	201	995	\$ 57,452,157	
67	45	58	104	122	83	80	127	619	\$ 35,922,007	
68	36	48	87	95	63	63	91	483	\$ 27,235,448	
69	25	46	61	75	42	33	76	358	\$ 20,325,917	
70 & Over	74	72	132	180	104	102	194	858	\$ 45,651,386	
Total	41,652	28,657	30,262	22,550	12,395	8,240	6,660	150,416	\$ 7,919,450,169	

Average Age: 45.11

Average Service: 11.86



Schedule H – Schedule of Active Member Data

STATE POLICE
As of June 30, 2017

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	\$ -
20 to 24	80	0	0	0	0	0	0	80	\$ 3,088,694
25 to 29	197	71	0	0	0	0	0	268	\$ 11,711,379
30 to 34	74	99	83	0	0	0	0	256	\$ 12,188,126
35 to 39	34	45	156	57	0	0	0	292	\$ 15,693,807
40 to 44	15	19	68	119	36	0	0	257	\$ 15,179,161
45 to 49	9	24	50	71	110	24	1	289	\$ 18,401,702
50 to 54	3	14	32	13	41	95	40	238	\$ 17,378,762
55 to 59	3	10	3	13	15	23	65	132	\$ 10,307,995
60	0	0	1	0	2	2	15	20	\$ 1,808,738
61	0	0	1	1	2	0	11	15	\$ 1,232,833
62	0	0	1	1	1	0	11	14	\$ 1,195,794
63	0	0	0	0	0	0	4	4	\$ 457,556
64	0	0	1	0	0	0	5	6	\$ 507,722
65	0	0	0	0	0	0	3	3	\$ 322,035
66	0	0	0	0	0	0	5	5	\$ 510,528
67	0	0	0	0	0	0	1	1	\$ 101,410
68	0	0	0	0	0	0	2	2	\$ 179,097
69	0	0	0	0	0	0	0	0	\$ -
70 & Over	0	0	0	0	0	0	0	0	\$ -
Total	415	282	396	275	207	144	163	1,882	\$ 110,265,339

Average Age: 41.24

Average Service: 14.37



Schedule H – Schedule of Active Member Data

JUDICIAL
As of June 30, 2017

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	\$ -
20 to 24	0	0	0	0	0	0	0	0	\$ -
25 to 29	0	0	0	0	0	0	0	0	\$ -
30 to 34	0	0	0	0	0	0	0	0	\$ -
35 to 39	6	0	0	0	0	0	0	6	\$ 897,186
40 to 44	15	2	1	0	0	0	0	18	\$ 2,774,583
45 to 49	27	17	6	0	0	0	0	50	\$ 7,799,674
50 to 54	28	16	12	4	0	0	0	60	\$ 9,357,294
55 to 59	32	10	26	8	8	1	0	85	\$ 13,473,611
60	6	5	7	2	3	0	0	23	\$ 3,668,281
61	5	6	4	7	1	0	0	23	\$ 3,665,485
62	4	8	4	3	0	1	0	20	\$ 3,173,308
63	7	2	5	4	4	0	0	22	\$ 3,459,642
64	3	1	5	4	2	3	0	18	\$ 2,857,608
65	3	4	3	7	3	4	0	24	\$ 3,804,609
66	4	6	5	4	4	0	0	23	\$ 3,605,942
67	0	2	1	3	1	2	1	10	\$ 1,615,688
68	1	2	1	4	2	1	0	11	\$ 1,732,813
69	0	2	2	1	7	0	0	12	\$ 1,860,792
70 & Over	1	2	3	4	2	2	2	16	\$ 2,541,941
Total	142	85	85	55	37	14	3	421	\$ 66,288,457

Average Age: 58.38

Average Service: 10.05



Schedule H – Schedule of Active Member Data

VIRGINIA LAW OFFICERS
As of June 30, 2017

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	40	0	0	0	0	0	0	40	\$ 1,214,229
20 to 24	760	4	0	0	0	0	0	764	\$ 24,803,452
25 to 29	1,183	183	3	0	0	0	0	1,369	\$ 46,923,598
30 to 34	632	342	187	0	0	0	0	1,161	\$ 42,765,836
35 to 39	378	223	282	103	2	0	0	988	\$ 37,565,543
40 to 44	278	189	258	259	108	1	0	1,093	\$ 44,382,269
45 to 49	239	190	255	265	248	64	3	1,264	\$ 53,267,863
50 to 54	157	151	207	209	161	68	19	972	\$ 41,652,221
55 to 59	85	108	157	164	87	26	27	654	\$ 27,777,446
60	10	25	15	27	10	11	5	103	\$ 4,584,146
61	11	9	23	17	6	2	6	74	\$ 3,157,019
62	6	4	15	20	7	1	8	61	\$ 2,743,565
63	5	7	14	13	8	3	8	58	\$ 2,791,509
64	4	7	8	4	10	1	6	40	\$ 1,823,840
65	4	5	8	4	2	3	2	28	\$ 1,257,191
66	1	2	4	4	1	1	2	15	\$ 734,884
67	1	2	2	1	0	2	0	8	\$ 384,701
68	1	0	0	0	1	0	1	3	\$ 136,007
69	0	2	2	1	0	2	2	9	\$ 479,005
70 & Over	0	1	5	3	2	0	3	14	\$ 705,997
Total	3,795	1,454	1,445	1,094	653	185	92	8,718	\$ 339,150,320

Average Age: 40.37

Average Service: 8.92



Schedule I – Schedule of Retiree and Beneficiary Data

RETIREE AND BENEFICIARY DATA
As of June 30, 2017

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	54,306	3,323	1,961	55,668	\$1,223,849	\$1,172,004	4.4%	\$ 21,985	\$ 21,581	1.9%
Teacher	84,069	4,850	1,922	86,997	2,090,205	2,000,999	4.5%	24,026	23,802	0.9%
Political	49,093	3,894	1,549	51,438	927,567	860,954	7.7%	18,033	17,537	2.8%
Total VRS	187,468	12,067	5,432	194,103	\$ 4,241,621	\$4,033,957	5.1%	\$ 21,852	\$ 21,518	1.6%
State Police	1,280	97	31	1,346	55,248	51,432	7.4%	41,046	40,181	2.2%
VaLORS	4,124	354	65	4,413	95,607	89,700	6.6%	21,665	21,751	-0.4%
Judicial	517	28	25	520	40,657	39,788	2.2%	78,187	76,959	1.6%
Totals	193,389	12,546	5,553	200,382	\$ 4,433,133	\$4,214,877	5.2%	\$ 22,123	\$ 21,795	1.5%

CHANGE IN ALLOWANCES FOR RETIREES AND BENEFICIARIES
As of June 30, 2017

	Prior Year Annual Allowances	COLA	Additions	Deletions	Current Year Annual Allowances
State	\$ 1,172,004	\$ 14,767	\$ 75,776	\$ 38,698	\$ 1,223,849
Teacher	2,000,999	25,213	107,239	43,246	2,090,205
Political	860,954	10,848	75,713	19,948	927,567
Total VRS	\$ 4,033,957	\$ 50,828	\$ 258,728	\$ 101,892	\$ 4,241,621
State Police	51,432	648	4,346	1,178	55,248
VaLORS	89,700	1,130	8,273	3,496	95,607
Judges	39,788	501	1,907	1,539	40,657
Totals	\$ 4,214,877	\$ 53,107	\$ 273,254	\$ 108,105	\$ 4,433,133