



**Cavanaugh Macdonald**  
CONSULTING, LLC

*The experience and dedication you deserve*



**Virginia  
Retirement  
System**

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

**Prepared as of June 30, 2016**





# Cavanaugh Macdonald

CONSULTING, LLC

*The experience and dedication you deserve*

December 16, 2016

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, 2016.

- 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, 2016. 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, 2016 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 based on the June 30, 2016 actuarial valuation, the employer contribution rates approved by the General Assembly for fiscal years ending 2015 and 2016, and the employer contribution rates approved by the General Assembly for fiscal years ending in 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.

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144

Phone (678) 388-1700 • Fax (678) 388-1730

[www.CavMacConsulting.com](http://www.CavMacConsulting.com)

Offices in Englewood, CO • Kennesaw, GA • Bellevue, NE



System	Fiscal Years 2015 & 2016 (see below)		Fiscal Years 2017 & 2018		Informational Only		
	Board Approved	General Assembly Approved	Board Approved	General Assembly Approved	Full Employer Contribution Rate for Defined Benefit Plan	Employer Rate for Hybrid DC Component	Total Employer Rate for Retirement Plans
	2013 Valuation		2015 Valuation		2016 Valuation		
State	15.80%	12.33%	14.46%	13.49%	12.97%	0.20%	13.17%
Teachers	18.20%	14.50%	16.32%	14.66%/16.32%	15.72%	0.14%	15.86%
SPORS	32.93%	25.82%	28.99%	28.54%	27.78%	N/A	27.78%
VaLORS	21.74%	17.67%	22.21%	21.05%	20.44%	N/A	20.44%
Judicial	57.84%	51.66%	45.15%	41.97%	37.94%	0.51%	38.45%
Political Subdivisions (Average rates)	9.91%	9.91%	8.15%	8.15%	7.53%	0.17%	7.70%

System	Rates Adopted by General Assembly Fiscal Year 2016		
	July 2015	August 2015	Sept. 2015 - June 2016
State	12.33%	13.28%	14.22%
Teachers	14.06%	14.06%	14.06%
SPORS	25.82%	26.83%	27.83%
VaLORS	17.67%	18.34%	19.00%
Judicial	49.62%	49.82%	50.02%

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(l)(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 27-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.

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 16, 2016  
The Board of Trustees  
Page 3

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, reading 'Jose I. Fernandez'.

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

A handwritten signature in blue ink, reading 'John J. Garrett'.

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

A handwritten signature in blue ink, reading 'Micki R. Taylor'.

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



## Table of Contents

---

<b><u>Section</u></b>	<b><u>Item</u></b>	<b><u>Page No.</u></b>
I	Summary of Principal Results	1
II	Membership Data	8
III	Assets	10
IV	Comments on Valuation	11
V	Contribution Rates	16
VI	Derivation of Experience Gains and Losses	18

## **Schedule**

A	Valuation Balance Sheet	20
B	Development of the Actuarial Value of Assets	26
C	Summary of Changes in Net Assets	32
D	Amortization Schedules Unfunded Accrued Liability	38
E	Outline of Actuarial Assumptions and Methods	43
F	Actuarial Cost Method	72
G	Summary of Main Plan Provisions as Interpreted for Valuation Purposes	73
H	Schedules of Active Member Data	111
I	Schedules of Retiree and Beneficiary Data	116



## Section I – Summary of Principal Results

- For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results for State Employees, Teachers, State Police, Judicial and Virginia Law Officers are summarized below. In addition, we present a summary of the valuation results for the political subdivisions.

### STATE EMPLOYEES (\$ IN THOUSANDS)

VALUATION DATE	June 30, 2016	June 30, 2015
Members:		
Active	74,968	75,256
Long Term Disability	2,267	2,285
Retirees and Beneficiaries	61,404	59,392
Inactive, Vested	12,232	11,731
Inactive, Non-Vested	26,258	24,447
Inactive, active elsewhere in VRS	<u>8,967</u>	<u>8,894</u>
Total	186,096	182,005
Annual Covered Payroll	\$ 4,002,477	\$ 3,872,724
Annual Retirement Benefits	\$ 1,172,004	\$ 1,126,274
Total Assets:		
Actuarial Value	\$ 16,672,776	\$ 15,881,597
Market Value	16,367,842	16,398,575
Actuarial Accrued Liability	\$ 22,878,243	\$ 22,291,558
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 188,800
Balance of UAAL	<u>6,205,467</u>	<u>6,221,161</u>
Total UAAL	\$ 6,205,467	\$ 6,409,961
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>For Informational Purposes</b>	<b>2017 &amp; 2018</b>
Employer Contribution Rate Defined Benefit Plan:		
Normal Cost (net of employee contributions)	3.95 %	4.18 %
Administrative Expense	0.26 %	0.27 %
Amortization of Deferred Contributions	0.00 %	0.97 %
Amortization of Balance of UAAL	<u>8.76 %</u>	<u>8.94 %</u>
Annual Recommended Contribution	12.97 %	14.36 %
Employer Contribution Rate Defined Contribution	<u>0.20 %</u>	<u>0.10 %</u>
Total Employer Contribution Rate Retirement Plans	13.17 %	14.46 %
Amortization Period (Years):		
Deferred Contributions	0	6
Balance of UAAL	18-27	19-28
Effective Amortization Period Total UAAL	29.5	26.5



**Section I – Summary of Principal Results**

**TEACHERS  
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2016	June 30, 2015
Members:		
Active	149,018	147,645
Long Term Disability	1	0
Retirees and Beneficiaries	88,563	84,977
Inactive, Vested	22,081	20,912
Inactive, Non-Vested	31,146	29,048
Inactive, active elsewhere in VRS	<u>5,375</u>	<u>5,345</u>
Total	296,184	287,927
Annual Covered Payroll	\$ 7,666,824	\$ 7,488,507
Annual Retirement Benefits	\$ 2,000,999	\$ 1,923,884
Total Assets:		
Actuarial Value	\$ 30,768,277	\$ 29,441,485
Market Value	30,168,211	30,344,072
Actuarial Accrued Liability	\$ 43,581,629	\$ 42,564,178
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 269,435	\$ 313,222
Balance of UAAL	<u>12,543,917</u>	<u>12,809,471</u>
Total UAAL	\$ 12,813,352	\$ 13,122,693
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>For Informational Purposes</b>	<b>2017 &amp; 2018</b>
Employer Contribution Rate Defined Benefit Plan:		
Normal Cost (net of employee contributions)	5.43 %	5.61 %
Administrative Expense	0.25 %	0.25 %
Amortization of Deferred Contributions	0.82 %	0.84 %
Amortization of Balance of UAAL	<u>9.22 %</u>	<u>9.55 %</u>
Annual Recommended Contribution	15.72 %	16.25 %
Employer Contribution Rate Defined Contribution	<u>0.14 %</u>	<u>0.07 %</u>
Total Employer Contribution Rate Retirement Plans	15.86 %	16.32 %
Amortization Period (Years):		
Deferred Contributions	5	6
Balance of UAAL	18-27	19-28
Effective Amortization Period Total UAAL	26.4	27.0



# Section I – Summary of Principal Results

## STATE POLICE (\$ IN THOUSANDS)

VALUATION DATE	June 30, 2016	June 30, 2015
Members:		
Active	1,940	1,994
Long-Term Disability	15	15
Retirees and Beneficiaries	1,433	1,416
Inactive, Vested	135	135
Inactive, Non-Vested	210	171
Inactive, active elsewhere in VRS	<u>238</u>	<u>233</u>
Total	3,971	3,964
Annual Covered Payroll	\$ 114,877	\$ 110,543
Annual Retirement Benefits	\$ 51,432	\$ 51,169
Total Assets:		
Actuarial Value	\$ 744,656	\$ 710,864
Market Value	730,688	733,352
Actuarial Accrued Liability	\$ 1,081,980	\$ 1,050,701
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 2,463
Balance of UAAL	<u>337,324</u>	<u>337,374</u>
Total UAAL	\$ 337,324	\$ 339,837
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>For Informational Purposes</b>	<b>2017 &amp; 2018</b>
Employer Contribution Rate:		
Normal Cost (net of employee contributions)	10.66 %	11.11 %
Administrative Expense	0.52 %	0.43 %
Amortization of Deferred Contributions	0.00 %	0.45 %
Amortization of Balance of UAAL	<u>16.60 %</u>	<u>17.00 %</u>
Annual Recommended Contribution	27.78 %	28.99 %
Amortization Period (Years):		
Deferred Contributions	0	6
Balance of UAAL	18-27	19-28
Effective Amortization Period Total UAAL	29.4	29.2





*Section I – Summary of Principal Results*

**JUDICIAL  
(\$ IN THOUSANDS)**

VALUATION DATE	June 30, 2016	June 30, 2015
Members:		
Active	416	401
Retirees and Beneficiaries	535	528
Inactive, Vested	6	5
Inactive, Non-Vested	0	0
Inactive, active elsewhere in VRS	<u>3</u>	<u>4</u>
Total	960	938
Annual Covered Payroll	\$ 65,524	\$ 61,881
Annual Retirement Benefits	\$ 39,788	\$ 38,773
Total Assets:		
Actuarial Value	\$ 476,321	\$ 442,250
Market Value	467,389	456,258
Actuarial Accrued Liability	\$ 607,798	\$ 600,388
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 9,842
Balance of UAAL	<u>131,477</u>	<u>148,296</u>
Total UAAL	\$ 131,477	\$ 158,138
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>For Informational Purposes</b>	<b>2017 &amp; 2018</b>
Employer Contribution Rate:		
Normal Cost (net of employee contributions)	27.39 %	28.95 %
Administrative Expense	0.56 %	0.46 %
Amortization of Deferred Contributions	0.00 %	3.18 %
Amortization of Balance of UAAL	<u>9.99 %</u>	<u>12.42 %</u>
Annual Recommended Contribution	37.94 %	45.01 %
Employer Contribution Rate Defined Contribution	<u>0.51 %</u>	<u>0.14 %</u>
Total Employer Contribution Rate Retirement	38.45 %	45.15 %
Amortization Period (Years):		
Deferred Contributions	0	6
Balance of UAAL	18-27	19-28
Effective Amortization Period Total UAAL	38.0	25.7



*Section I – Summary of Principal Results*

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

VALUATION DATE	June 30, 2016	June 30, 2015
Members:		
Active	9,106	8,820
Long Term Disability	581	593
Retirees and Beneficiaries	4,457	4,114
Inactive, Vested	955	865
Inactive, Non-Vested	4,341	3,929
Inactive, active elsewhere in VRS	<u>2,639</u>	<u>2,457</u>
Total	22,079	20,778
Annual Covered Payroll	\$ 352,677	\$ 330,397
Annual Retirement Benefits	\$ 89,700	\$ 84,386
Total Assets:		
Actuarial Value	\$ 1,235,490	\$ 1,155,767
Market Value	1,211,446	1,191,353
Actuarial Accrued Liability	\$ 1,984,257	\$ 1,906,721
Unfunded Actuarial Accrued Liability (UAAL):		
10-Year Payback of Deferred Contributions	\$ 0	\$ 19,172
Balance of UAAL	<u>748,767</u>	<u>731,782</u>
Total UAAL	\$ 748,767	\$ 750,954
<b>RECOMMENDED CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>For Informational Purposes</b>	<b>2017 &amp; 2018</b>
Employer Contribution Rate:		
Normal Cost (net of employee contributions)	7.75 %	8.15 %
Administrative Expense	0.27 %	0.23 %
Amortization of Deferred Contributions	0.00 %	1.16 %
Amortization of Balance of UAAL	<u>12.42 %</u>	<u>12.67 %</u>
Annual Recommended Contribution	20.44 %	22.21 %
Amortization Period (Years):		
Deferred Contributions	0	6
Balance of UAAL	18-27	19-28
Effective Amortization Period Total UAAL	27.7	25.8



## Section I – Summary of Principal Results

### POLITICAL SUBDIVISIONS (\$ IN THOUSANDS)

VALUATION DATE	June 30, 2016	June 30, 2015
Number of Political Subdivisions in VRS	585	585
Members:		
Active	106,271	105,932
Long Term Disability	0	0
Retirees and Beneficiaries*	63,050	59,507
Inactive, Vested*	15,834	14,919
Inactive, Non-Vested*	31,769	28,989
Inactive, active elsewhere in VRS	<u>30,128</u>	<u>28,851</u>
Total	247,052	238,198
Annual Covered Payroll	\$ 4,656,697	\$ 4,540,149
Annual Retirement Benefits	\$860,954	\$ 804,793
Total Assets:**		
Actuarial Value	\$ 17,762,683	\$ 16,760,519
Market Value	17,418,106	17,283,021
Actuarial Accrued Liability**	\$ 20,659,120	\$ 19,855,406
Unfunded Actuarial Accrued Liability (UAAL)**	2,896,437	3,094,887
	<b>For Informational Purposes</b>	<b>For Informational Purposes</b>
Average Employer Contribution Rate Defined Benefit Plan ( <i>net of employee contributions</i> )	7.53 %	8.05 %
Average Employer Contribution Rate Defined Contribution Plan	<u>0.17 %</u>	<u>0.10 %</u>
Average Employer Contribution Rate Retirement Plans	7.70 %	8.15 %
Amortization Period (Years)	18-27	19-28
Effective Amortization Period Total UAAL	37.6	36.0

\* 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, 2016 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 valuation reflects an administrative expense charge being added to the employer contribution rates to cover plan administrative expenses.
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(l)(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 6/30/2016	Outstanding Balance as of 6/30/2015
State Employees	\$ 0	\$ 188,800
Teachers	269,435	313,222
State Police	0	2,463
Virginia Law Officers	0	19,172
Judicial	0	9,842
Total	\$ 269,435	\$ 533,499



## 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, 2016 on the basis of which the valuation was prepared.

**TABLE 1**

**THE NUMBER AND ANNUAL COMPENSATION OF  
ACTIVE MEMBERS AS OF JUNE 30, 2016  
(\$ IN THOUSANDS)**

DIVISION	NUMBER	COMPENSATION
State Employees	74,968	\$4,002,477
Teachers	149,018	7,666,824
State Police	1,940	114,877
Judicial	416	65,524
Virginia Law Officers	9,106	352,677
Political Subdivisions	<u>106,271</u>	<u>4,656,697</u>
Total	341,719	\$16,859,077

- 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
6/30/2016	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 %
6/30/2012	340,029	15,386,038	45,249	0.50 %



## Section II – Membership Data

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

**TABLE 3**  
**THE NUMBER AND ANNUAL RETIREMENT BENEFITS**  
**OF RETIRED MEMBERS AND SURVIVORS OF DECEASED MEMBERS**  
**ON THE ROLL AS OF JUNE 30, 2016**  
**(\$ IN THOUSANDS)**

TYPE OF RETIREMENT	DIVISION						TOTAL
	STATE EMPLOYEES	TEACHERS	STATE POLICE	JUDICIAL	VIRGINIA LAW OFFICERS	POLITICAL SUBDIVISIONS*	
Service:							
Number	52,585	81,204	1,042	394	3,959	50,985	190,169
Annual Benefits	\$1,046,345	\$1,865,917	\$41,646	\$33,192	\$83,992	\$705,277	\$3,776,369
Disability:							
Number	3,919	4,350	182	1	251	7,983	16,686
Annual Benefits	\$62,340	\$92,826	\$6,098	\$108	\$3,725	\$118,606	\$283,703
Survivors:							
Number	4,900	3,009	209	140	247	4,082	12,587
Annual Benefits	\$63,319	\$42,256	\$3,688	\$6,488	\$1,983	\$37,071	\$154,805
Total:							
Number	61,404	88,563	1,433	535	4,457	63,050	219,442
Annual Benefits	\$1,172,004	\$2,000,999	\$51,432	\$39,788	\$89,700	\$860,954	\$4,214,877

- \* 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.

4. 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, 2016, 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, 2016 MARKET VALUE	JUNE 30, 2015 MARKET VALUE
State Employees	\$16,367,842	\$16,398,575
Teachers	30,168,211	30,344,072
State Police	730,688	733,352
Judicial	467,389	456,258
Virginia Law Officers	1,211,446	1,191,353
Political Subdivisions	<u>17,418,106</u>	<u>17,283,021</u>
Total Market Value of Assets	\$66,363,682	\$66,406,631

- Schedule B shows the development of the actuarial value of assets as of June 30, 2016. 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, 2016 ACTUARIAL VALUE	JUNE 30, 2015 ACTUARIAL VALUE
State Employees	\$16,672,776	\$15,881,597
Teachers	30,768,277	29,441,485
State Police	744,656	710,864
Judicial	476,321	442,250
Virginia Law Officers	1,235,490	1,155,767
Political Subdivisions	<u>17,762,683</u>	<u>16,760,519</u>
Total Actuarial Value of Assets	\$67,660,203	\$64,392,482



## Section IV – Comments on Valuation

---

### State Employees

1. The total valuation balance sheet on account of benefits as of June 30, 2016 shows that the State Employees plan has total prospective benefit liabilities of \$25,409,952,535, of which \$12,363,693,914 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$1,044,812,284 is for the prospective benefits payable on account of present inactive members, and \$12,001,446,337 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 \$16,672,776,000 as of June 30, 2016. The difference of \$8,737,176,535 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, \$1,288,643,938 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 \$7,448,532,597 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 3.95% of salary are required. This is net of the 4.86% 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 \$1,243,065,969. When this amount is subtracted from \$7,448,532,597, which is the present value of the total future contributions to be made by the employers, there remains \$6,205,466,628 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 8.76% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$6,205,466,628 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 1.46% of pay for members in the Hybrid Plan. The employer defined contribution rate as a percent of the plan's total payroll is 0.20%.





## Section IV – Comments on Valuation

---

### Teachers

1. The total valuation balance sheet on account of benefits as of June 30, 2016 shows that the Teachers plan has total prospective benefit liabilities of \$50,476,808,961, of which \$23,495,540,619 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$1,063,533,297 is for the prospective benefits payable on account of present inactive members, and \$25,917,735,045 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 \$30,768,277,000 as of June 30, 2016. The difference of \$19,708,531,961 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, \$3,109,300,890 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 \$16,599,231,071 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 5.43% of salary are required. This is net of the 4.89% blended employee contribution rate. In addition, there is a required contribution rate of 0.25% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$3,785,878,684. When this amount is subtracted from \$16,599,231,071, which is the present value of the total future contributions to be made by the employers, there remains \$12,813,352,387 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 10.04% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$12,813,352,387 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 1.29% of pay for members in the Hybrid Plan. The employer defined contribution rate as a percent of the plan's total payroll is 0.14%.



## Section IV – Comments on Valuation

---

### **State Police (SPORS)**

1. The total valuation balance sheet on account of benefits as of June 30, 2016 shows that the SPORS plan has total prospective benefit liabilities of \$1,231,652,342, of which \$563,688,745 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$22,147,992 is for the prospective benefits payable on account of present inactive members, and \$645,815,605 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 \$744,656,000 as of June 30, 2016. The difference of \$486,996,342 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, \$43,376,698 is the present value of future contributions expected to be made by members (at the rate of 5% of salary) and the balance of \$443,619,644 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 10.66% of salary are required. This is net of the 5% employee contribution rate. In addition, there is a required contribution rate of 0.52% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$106,296,067. When this amount is subtracted from \$443,619,644, which is the present value of the total future contributions to be made by the employers, there remains \$337,323,577 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 16.60% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$337,323,577 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, 2016 shows that the Judicial plan has total prospective benefit liabilities of \$737,245,303, of which \$393,818,452 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$1,879,874 is for the prospective benefits payable on account of present inactive members, and \$341,546,977 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 \$476,321,000 as of June 30, 2016. The difference of \$260,924,303 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, \$21,002,051 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 \$239,922,252 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 27.39% of salary are required. This is net of the 4.80% employee contribution rate. In addition, there is a required contribution rate of 0.56% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$108,445,531. When this amount is subtracted from \$239,922,252, which is the present value of the total future contributions to be made by the employers, there remains \$131,476,721 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 9.99% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$131,476,721 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 2.63% of pay for members in the Hybrid Plan. The employer defined contribution rate as a percent of the plan's total payroll is 0.51%.



## Section IV – Comments on Valuation

---

### Virginia Law Officers (VaLORS)

1. The total valuation balance sheet on account of benefits as of June 30, 2016 shows that VaLORS has total prospective benefit liabilities of \$2,261,002,742, of which \$1,006,287,720 is for the prospective benefits payable on account of present retired members and survivors of deceased members, \$154,218,994 is for the prospective benefits payable on account of present inactive members, and \$1,100,496,028 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 \$1,235,490,000 as of June 30, 2016. The difference of \$1,025,512,742 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, \$97,593,490 is the present value of future contributions expected to be made by members (at the rate of 5% of salary) and the balance of \$927,919,252 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 7.75% of salary are required. This is net of the 5% employee contribution rate. In addition, there is a required contribution rate of 0.27% of pay for administrative expenses.
3. Prospective employer normal contributions at the above rate have a present value of \$179,152,585. When this amount is subtracted from \$927,919,252, which is the present value of the total future contributions to be made by the employers, there remains \$748,766,667 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 12.42% of salary. This rate is sufficient to liquidate the unfunded accrued liability of \$748,766,667 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, 2016 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	12.97%	0.20%	13.17%
Teachers	15.72	0.14	15.86
State Police	27.78	N/A	27.78
Judicial	37.94	0.51	38.45
Virginia Law Officers	20.44	N/A	20.44

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, 2016.

**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	6.24%	8.25%	12.40%	28.67%	7.49%
Disability Benefits	0.88%	0.48%	0.91%	2.48%	1.99%
Survivor Benefits	0.27%	0.17%	0.65%	1.04%	0.40%
Separation Benefits	<u>1.42%</u>	<u>1.42%</u>	<u>1.70%</u>	<u>0.00%</u>	<u>2.87%</u>
Total	8.81%	10.32%	15.66%	32.19%	12.75%
Member Current Contributions	<u>4.86%</u>	<u>4.89%</u>	<u>5.00%</u>	<u>4.80%</u>	<u>5.00%</u>
Employer Normal Cost	3.95%	5.43%	10.66%	27.39%	7.75%
Administrative Expense	0.26%	0.25%	0.52%	0.56%	0.27%
Amortization of UAAL ( <i>net of deferred contributions</i> ) *	8.76%	9.22%	16.60%	9.99%	12.42%
Amortization of Deferred Contributions *	0.00%	0.82%	0.00%	0.00%	0.00%
Actuarially Recommended Employer Defined Benefit Plan Contribution Rate to pay Normal Cost and amortize UAAL	12.97%	15.72%	27.78%	37.94%	20.44%
<u>Defined Contribution Hybrid Plan</u>	0.20%	0.14%	N/A	0.51%	N/A
Employer Contribution Rate for Retirement Plans	13.17%	15.86%	27.78%	38.45%	20.44%

- \* 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(l)(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 2016  
(\$ IN THOUSANDS)**

	State Employees	Teachers	State Police	Judicial	Virginia Law Officers	Political Subdivisions	Total
<b>A. Calculation of Expected Unfunded Actuarial Accrued Liability</b>							
1. UAAL as of June 30, 2015	\$ 6,409,961	\$ 13,122,693	\$ 339,837	\$ 158,138	\$ 750,954	\$ 3,094,887	\$23,876,470
2. Normal Cost for previous year	345,588	774,632	17,477	20,540	42,624	500,301	1,701,162
3. Actual contributions during the year	(912,539)	(1,423,571)	(38,801)	(44,360)	(95,988)	(765,055)	(3,280,314)
4. Interest at previous year's rate of 0.07							
a. on UAAL	448,697	918,589	23,789	11,070	52,567	216,642	1,671,354
b. on normal cost	24,191	54,224	1,223	1,438	2,984	35,021	119,081
c. on contributions	(31,939)	(49,825)	(1,358)	(1,553)	(3,360)	(26,777)	(114,812)
d. total: (a)+(b)+(c)	\$ 440,949	\$ 922,988	\$ 23,654	\$ 10,955	\$ 52,191	\$ 224,886	\$ 1,675,623
5. Expected UAAL as of June 30, 2016 A1+A2+A3+A4	6,283,959	13,396,742	342,167	145,273	749,781	3,055,019	23,972,941
6. Actual UAAL as of June 30, 2016	6,205,467	12,813,352	337,324	131,477	748,767	2,896,437	23,132,824
7. Total Gain/(Loss): A5-A6	\$ 78,492	\$ 583,390	\$ 4,843	\$ 13,796	\$ 1,014	\$ 158,582	\$ 840,117
<b>B. Calculation of Asset Gain/(Loss)</b>							
1. Actuarial Value of Assets (AVA) as of June 30, 2015	\$15,881,597	\$ 29,441,485	\$ 710,864	\$ 442,250	\$ 1,155,767	\$16,760,519	\$64,392,482
2. Contributions during the year	\$ 912,539	\$ 1,423,571	\$ 38,801	\$ 44,360	\$ 95,988	\$ 765,055	\$ 3,280,314
3. Benefit payments during the year	(1,220,438)	(2,116,136)	(54,099)	(41,341)	(96,794)	(930,965)	(4,459,773)
4. Interest at previous year's rate of 0.07							
a. on AVA at beginning of year	\$ 1,111,712	\$ 2,060,904	\$ 49,760	\$ 30,958	\$ 80,904	\$ 1,173,236	\$ 4,507,474
b. on contributions	31,939	49,825	1,358	1,553	3,360	26,777	114,812
c. on benefit payments	(42,715)	(74,065)	(1,893)	(1,447)	(3,388)	(32,584)	(156,092)
d. total: (a)+(b)+(c)	\$ 1,100,936	\$ 2,036,664	\$ 49,225	\$ 31,064	\$ 80,876	\$ 1,167,429	\$ 4,466,194
5. Expected AVA as of June 30, 2016 B1+B2+B3+B4	16,674,634	30,785,584	744,791	476,333	1,235,837	17,762,038	67,679,217
6. Actual 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
7. Gain/(Loss) on assets: B6-B5	\$ (1,858)	\$ (17,307)	\$ (135)	\$ (12)	\$ (347)	\$ 645	\$ (19,014)
<b>C. Calculation of Liability Gain/(Loss)</b>							
1. Gain/(Loss) due to changes in actuarial assumptions	0	0	0	0	0	0	0
2. Gain/(Loss) due to plan amendments	0	0	0	0	0	(32,877)	(32,877)
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	\$ 80,350	\$ 600,697	\$ 4,978	\$ 13,808	\$ 1,361	\$ 190,814	\$ 892,008



## Section VI – Derivation of Experience Gains and Losses

### GAINS & LOSSES DURING FISCAL YEAR 2016 (\$ IN MILLIONS)

Type of Activity	State Employees	Teachers	State Police	Judges	Virginia Law Officers	Political Subdivisions
<b>Age &amp; Service Retirements.</b> If members retire at older ages, there is a gain. If younger ages, a loss.	(\$9.6)	\$73.4	\$9.5	\$4.1	(\$9.5)	(\$18.5)
<b>Disability Before Retirement.</b> If disability claims are less than assumed, there is a gain. If more claims, a loss.	(\$2.6)	\$2.9	(\$0.4)	\$0.6	(\$0.9)	\$1.3
<b>Death-in Service Benefits.</b> If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	\$0.6	\$0.8	(\$0.3)	\$0.3	\$0.3	\$26.4
<b>Withdrawal from Employment.</b> If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(\$41.6)	(\$118.3)	\$0.6	\$0.3	\$2.7	\$3.7
<b>Pay Increases.</b> If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(\$116.7)	\$156.9	(\$16.8)	\$3.5	(\$15.7)	\$15.7
<b>New Members.</b> Additional unfunded accrued liability will produce a loss.	(\$3.8)	(\$22.3)	\$0.0	(\$0.9)	(\$0.4)	(\$11.0)
<b>Death after Retirement.</b> If retirants live longer than assumed, there is a loss. If not as long, a gain.	(\$10.6)	(\$6.2)	(\$0.9)	(\$1.6)	\$7.5	(\$18.5)
<b>Data and Other Adjustments.</b>	(\$22.0)	(\$12.4)	\$0.6	\$0.1	\$0.5	(\$2.9)
<b>Benefit Payments.</b> If benefit payments are greater than expected, there is a loss. If the benefits payments are less, a gain.	\$9.7	(\$6.8)	(\$0.5)	(\$1.6)	(\$5.4)	(\$12.3)
<b>Cost of Living Allowance (COLA).</b> If COLA is greater than expected, there is a loss. If COLA is less, a gain.	\$277.0	\$532.7	\$13.1	\$9.0	\$22.2	\$207.0
<b>Investment Income.</b> If there is a greater investment income than assumed, there is a gain. If less income, a loss.	(\$1.9)	(\$17.3)	(\$0.1)	\$0.0	(\$0.3)	\$0.6
<b>Gain or (Loss) During Year</b>	\$78.5	\$583.4	\$4.8	\$13.8	\$1.0	\$191.5
<b>Non-Recurring Items.</b> Adjustments for plan amendments, assumption changes, etc.	0.0	0.0	0.0	0.0	0.0	(\$32.9)
<b>Expected Contributions vs. Actual Contributions.</b> If the difference in the actual contribution to the plan is more or less than what was expected based on the previous valuation then there will be a gain or loss associated with this difference.	145.7	(224.0)	(0.0)	13.2	3.2	\$87.9
<b>Total Gain or (Loss) During Year</b>	\$224.2	\$359.4	\$4.8	\$27.0	\$4.2	\$246.5





*Schedule A – Balance Sheet*

**STATE EMPLOYEES**  
**As of June 30, 2016**

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets	\$	16,672,776,000
Present value of future members' contributions		1,288,643,938
Present value of future employer contributions		
Normal contributions	\$	1,243,065,969
Unfunded accrued liability contributions		<u>6,205,466,628</u>
Total prospective employer contributions		<u>7,448,532,597</u>
Total Present and Prospective Assets	\$	<u><u>25,409,952,535</u></u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits	\$	12,363,693,914
Present value of prospective benefits payable on account of inactive members		1,044,812,284
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$10,917,642,422	
Disability retirement benefits	527,302,641	
Survivor benefits	264,720,320	
Separation benefits	<u>291,780,954</u>	
Total		<u>12,001,446,337</u>
Total Actuarial Liabilities	\$	<u><u>25,409,952,535</u></u>



*Schedule A – Balance Sheet*

**TEACHERS**  
**As of June 30, 2016**

<b>PRESENT AND PROSPECTIVE ASSETS</b>		
Actuarial Value of Assets		\$ 30,768,277,000
Present value of future members' contributions		3,109,300,890
Present value of future employer contributions		
Normal contributions	\$ 3,785,878,684	
Unfunded accrued liability contributions	<u>12,813,352,387</u>	
Total prospective employer contributions		<u>16,599,231,071</u>
Total Present and Prospective Assets		<u><u>\$ 50,476,808,961</u></u>
<b>ACTUARIAL LIABILITIES</b>		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 23,495,540,619
Present value of prospective benefits payable on account of inactive members		1,063,533,297
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 24,236,738,853	
Disability retirement benefits	574,389,322	
Survivor benefits	314,189,220	
Separation benefits	<u>792,417,650</u>	
Total		<u>25,917,735,045</u>
Total Actuarial Liabilities		<u><u>\$ 50,476,808,961</u></u>



*Schedule A – Balance Sheet*

**STATE POLICE**  
**As of June 30, 2016**

PRESENT AND PROSPECTIVE ASSETS		
Actuarial Value of Assets	\$	744,656,000
Present value of future members' contributions		43,376,698
Present value of future employer contributions		
Normal contributions	\$	106,296,067
Unfunded accrued liability contributions		<u>337,323,577</u>
Total prospective employer contributions		<u>443,619,644</u>
Total Present and Prospective Assets	\$	<u><u>1,231,652,342</u></u>
ACTUARIAL LIABILITIES		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits	\$	563,688,745
Present value of prospective benefits payable on account of inactive members		22,147,992
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$	586,107,228
Disability retirement benefits		21,346,149
Survivor benefits		14,094,276
Separation benefits		<u>24,267,952</u>
Total		<u>645,815,605</u>
Total Actuarial Liabilities	\$	<u><u>1,231,652,342</u></u>



*Schedule A – Balance Sheet*

**JUDICIAL**  
**As of June 30, 2016**

<b>PRESENT AND PROSPECTIVE ASSETS</b>			
Actuarial Value of Assets		\$	476,321,000
Present value of future members' contributions			21,002,051
Present value of future employer contributions			
Normal contributions	\$	108,445,531	
Unfunded accrued liability contributions		<u>131,476,721</u>	
Total prospective employer contributions			<u>239,922,252</u>
Total Present and Prospective Assets		\$	<u><u>737,245,303</u></u>
<b>ACTUARIAL LIABILITIES</b>			
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$	393,818,452
Present value of prospective benefits payable on account of inactive members			1,879,874
Present value of prospective benefits payable on account of present active members:			
Service retirement benefits	\$	323,330,203	
Disability retirement benefits		8,706,358	
Survivor benefits		9,510,416	
Separation benefits		<u>-</u>	
Total			<u>341,546,977</u>
Total Actuarial Liabilities		\$	<u><u>737,245,303</u></u>



*Schedule A – Balance Sheet*

**VIRGINIA LAW OFFICERS**

**As of June 30, 2016**

<b>PRESENT AND PROSPECTIVE ASSETS</b>		
Actuarial Value of Assets		\$ 1,235,490,000
Present value of future members' contributions		97,593,490
Present value of future employer contributions		
Normal contributions	\$ 179,152,585	
Unfunded accrued liability contributions	<u>748,766,667</u>	
Total prospective employer contributions		<u>927,919,252</u>
Total Present and Prospective Assets		<u><u>\$ 2,261,002,742</u></u>
<b>ACTUARIAL LIABILITIES</b>		
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$ 1,006,287,720
Present value of prospective benefits payable on account of inactive members		154,218,994
Present value of prospective benefits payable on account of present active members:		
Service retirement benefits	\$ 903,779,877	
Disability retirement benefits	64,530,166	
Survivor benefits	21,085,152	
Separation benefits	<u>111,100,833</u>	
Total		<u>1,100,496,028</u>
Total Actuarial Liabilities		<u><u>\$ 2,261,002,742</u></u>



*Schedule A – Balance Sheet*

**POLITICAL SUBDIVISIONS**

**As of June 30, 2016**

<b>PRESENT AND PROSPECTIVE ASSETS</b>			
Actuarial Value of Assets		\$	17,762,683,000
Present value of future members' contributions			1,605,453,074
Present value of future employer contributions			
Normal contributions	\$ 2,385,429,102		
Unfunded accrued liability contributions	<u>2,896,436,964</u>		
Total prospective employer contributions			<u>5,281,866,066</u>
Total Present and Prospective Assets		\$	<u><u>24,650,002,140</u></u>
<b>ACTUARIAL LIABILITIES</b>			
Present value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		\$	9,513,899,411
Present value of prospective benefits payable on account of inactive members			1,236,460,009
Present value of prospective benefits payable on account of present active members:			
Service retirement benefits	\$12,192,830,279		
Disability retirement benefits	713,845,560		
Survivor benefits	311,347,240		
Separation benefits	<u>681,619,641</u>		
Total			<u>13,899,642,720</u>
Total Actuarial Liabilities		\$	<u><u>24,650,002,140</u></u>



*Schedule B – Development of Actuarial Value of Assets*

**STATE EMPLOYEES**  
**For the Year Ending June 30, 2016**  
**(\$ in thousands)**

(1)	Actuarial Value Beginning of Year	\$	15,881,597
(2)	Market Value End of Year	\$	16,367,842
(3)	Market Value Beginning of Year	\$	16,398,575
(4)	Cash Flow		
a.	Contributions	\$	922,801
b.	Benefit Payments		(1,220,438)
c.	Administrative Expenses		(10,140)
d.	Miscellaneous revenue and expenses		(122)
e.	Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(307,899)
(5)	Investment Income		
a.	Market total: (2) – (3) – (4)e	\$	277,166
b.	Assumed Rate		7.00%
c.	Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	1,137,124
d.	Amount for Phased-in Recognition: (5)a – (5)c	\$	(859,958)
(6)	Phased-In Recognition of Investment Income		
a.	Current Year: 0.20 x (5)d	\$	(171,992)
b.	First Prior Year		(79,389)
c.	Second Prior Year		247,257
d.	Third Prior Year		126,685
e.	Fourth Prior Year		(160,607)
f.	Total Recognized Investment Gain	\$	(38,046)
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	16,672,776



*Schedule B – Development of Actuarial Value of Assets*

**TEACHERS**  
**For the Year Ending June 30, 2016**  
**(\$ in thousands)**

(1)	Actuarial Value Beginning of Year	\$	29,441,485
(2)	Market Value End of Year	\$	30,168,211
(3)	Market Value Beginning of Year	\$	30,344,072
(4)	Cash Flow		
a.	Contributions	\$	1,442,652
b.	Benefit Payments		(2,116,136)
c.	Administrative Expenses		(18,859)
d.	Miscellaneous revenue and expenses		(222)
e.	Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(692,565)
(5)	Investment Income		
a.	Market total: (2) – (3) – (4)e	\$	516,704
b.	Assumed Rate		7.00%
c.	Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	2,099,845
d.	Amount for Phased-in Recognition: (5)a – (5)c	\$	(1,583,141)
(6)	Phased-In Recognition of Investment Income		
a.	Current Year: 0.20 x (5)d	\$	(316,628)
b.	First Prior Year		(147,364)
c.	Second Prior Year		443,811
d.	Third Prior Year		220,918
e.	Fourth Prior Year		(281,225)
f.	Total Recognized Investment Gain	\$	(80,488)
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	30,768,277





*Schedule B – Development of Actuarial Value of Assets*

**STATE POLICE**  
**For the Year Ending June 30, 2016**  
**(\$ in thousands)**

(1)	Actuarial Value Beginning of Year	\$	710,864
(2)	Market Value End of Year	\$	730,688
(3)	Market Value Beginning of Year	\$	733,352
(4)	Cash Flow		
a.	Contributions	\$	39,414
b.	Benefit Payments		(54,099)
c.	Administrative Expenses		(590)
d.	Miscellaneous revenue and expenses		(23)
e.	Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(15,298)
(5)	Investment Income		
a.	Market total: (2) – (3) – (4)e	\$	12,634
b.	Assumed Rate		7.00%
c.	Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	50,800
d.	Amount for Phased-in Recognition: (5)a – (5)c	\$	(38,166)
(6)	Phased-In Recognition of Investment Income		
a.	Current Year: 0.20 x (5)d	\$	(7,633)
b.	First Prior Year		(3,555)
c.	Second Prior Year		10,912
d.	Third Prior Year		5,418
e.	Fourth Prior Year		(6,852)
f.	Total Recognized Investment Gain	\$	(1,710)
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	744,656



*Schedule B – Development of Actuarial Value of Assets*

**JUDICIAL**  
**For the Year Ending June 30, 2016**  
**(\$ in thousands)**

(1)	Actuarial Value Beginning of Year	\$	442,250
(2)	Market Value End of Year	\$	467,389
(3)	Market Value Beginning of Year	\$	456,258
(4)	Cash Flow		
a.	Contributions	\$	44,738
b.	Benefit Payments		(41,341)
c.	Administrative Expenses		(363)
d.	Miscellaneous revenue and expenses		(15)
e.	Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	3,019
(5)	Investment Income		
a.	Market total: (2) – (3) – (4)e	\$	8,112
b.	Assumed Rate		7.00%
c.	Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	32,044
d.	Amount for Phased-in Recognition: (5)a – (5)c	\$	(23,932)
(6)	Phased-In Recognition of Investment Income		
a.	Current Year: 0.20 x (5)d	\$	(4,786)
b.	First Prior Year		(2,198)
c.	Second Prior Year		6,720
d.	Third Prior Year		3,365
e.	Fourth Prior Year		(4,093)
f.	Total Recognized Investment Gain	\$	(992)
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	476,321



*Schedule B – Development of Actuarial Value of Assets*

**VIRGINIA LAW OFFICERS**  
**For the Year Ending June 30, 2016**  
**(\$ in thousands)**

(1)	Actuarial Value Beginning of Year	\$	1,155,767
(2)	Market Value End of Year	\$	1,211,446
(3)	Market Value Beginning of Year	\$	1,191,353
(4)	Cash Flow		
a.	Contributions	\$	96,966
b.	Benefit Payments		(96,794)
c.	Administrative Expenses		(940)
d.	Miscellaneous revenue and expenses		(38)
e.	Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(806)
(5)	Investment Income		
a.	Market total: (2) – (3) – (4)e	\$	20,899
b.	Assumed Rate		7.00%
c.	Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	83,367
d.	Amount for Phased-in Recognition: (5)a – (5)c	\$	(62,468)
(6)	Phased-In Recognition of Investment Income		
a.	Current Year: 0.20 x (5)d	\$	(12,494)
b.	First Prior Year		(5,716)
c.	Second Prior Year		17,316
d.	Third Prior Year		8,456
e.	Fourth Prior Year		(10,400)
f.	Total Recognized Investment Gain	\$	(2,838)
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	1,235,490



*Schedule B – Development of Actuarial Value of Assets*

**POLITICAL SUBDIVISIONS**  
**For the Year Ending June 30, 2016**  
**(\$ in thousands)**

(1)	Actuarial Value Beginning of Year	\$	16,760,519
(2)	Market Value End of Year	\$	17,418,106
(3)	Market Value Beginning of Year	\$	17,283,021
(4)	Cash Flow		
a.	Contributions	\$	775,881
b.	Benefit Payments		(930,965)
c.	Administrative Expenses		(10,696)
d.	Miscellaneous revenue and expenses		(130)
e.	Net Cash Flow: [(4)a + (4)b + (4)c + (4)d]	\$	(165,910)
(5)	Investment Income		
a.	Market total: (2) – (3) – (4)e	\$	300,995
b.	Assumed Rate		7.00%
c.	Amount of Immediate Recognition [(3) x (5)b] + [(4)e x (5)b x 0.5]	\$	1,204,004
d.	Amount for Phased-in Recognition: (5)a – (5)c	\$	(903,009)
(6)	Phased-In Recognition of Investment Income		
a.	Current Year: 0.20 x (5)d	\$	(180,602)
b.	First Prior Year		(81,957)
c.	Second Prior Year		250,697
d.	Third Prior Year		122,308
e.	Fourth Prior Year		(146,376)
f.	Total Recognized Investment Gain	\$	(35,930)
(7)	Actuarial Value End of Year: [(1) + (4)e + (5)c + (6)f]	\$	17,762,683



Schedule C – Summary of Changes in Net Assets

**STATE EMPLOYEES**  
**For the Year Ending June 30, 2016**  
**(\$ in thousands)**

Additions for the Year

Contributions:		
Members	\$	200,061
Members (paid by employer)		123
Employers		<u>722,617</u>
Total	\$	922,801
Miscellaneous Revenue		(122)
Net Investment Income		<u>277,166</u>
TOTAL	\$	1,199,845

Deductions for the Year

Benefit Payments	\$	1,195,198
Refunds		25,240
Transfers		-
Administrative Expenses		<u>10,140</u>
TOTAL	\$	<u>1,230,578</u>

<u>Excess of Additions Over Deductions</u>	\$	<u>(30,733)</u>
--	----	-----------------

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2015	\$	16,398,575
Excess of Additions over Deductions		<u>(30,733)</u>
Market Value of Assets as of 6/30/2016*	\$	<u>16,367,842</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, 2016**  
**(\$ in thousands)**

Additions for the Year

Contributions:		
Members	\$	365,794
Members (paid by employer)		14,520
Employers		<u>1,062,338</u>
Total	\$	1,442,652
Miscellaneous Revenue		(222)
Net Investment Income		<u>516,704</u>
TOTAL	\$	<u>1,959,134</u>

Deductions for the Year

Benefit Payments	\$	2,081,069
Refunds		35,067
Transfers		-
Administrative Expenses		<u>18,859</u>
TOTAL	\$	<u>2,134,995</u>

<u>Excess of Additions Over Deductions</u>	<u>\$</u>	<u>(175,861)</u>
--	-----------	------------------

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2015	\$	30,344,072
Excess of Additions over Deductions		<u>(175,861)</u>
Market Value of Assets as of 6/30/2016*	\$	<u><u>30,168,211</u></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, 2016**  
**(\$ in thousands)**

Additions for the Year

Contributions:		
Members	\$	5,759
Members (paid by employer)		-
Employers		<u>33,655</u>
Total	\$	39,414
Miscellaneous Revenue		(23)
Net Investment Income		<u>12,634</u>
TOTAL	\$	52,025

Deductions for the Year

Benefit Payments	\$	53,515
Refunds		584
Transfers		-
Administrative Expenses		<u>590</u>
TOTAL	\$	<u>54,689</u>

Excess of Additions Over Deductions \$ (2,664)

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2015	\$	733,352
Excess of Additions over Deductions		<u>(2,664)</u>
Market Value of Assets as of 6/30/2016*	\$	<u>730,688</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, 2016**  
**(\$ in thousands)**

Additions for the Year

Contributions:		
Members	\$	887
Members (paid by employer)		2,349
Employers		<u>41,502</u>
Total	\$	44,738
Miscellaneous Revenue		(15)
Net Investment Income		<u>8,112</u>
TOTAL	\$	<u>52,835</u>

Deductions for the Year

Benefit Payments	\$	41,341
Refunds		-
Transfers		-
Administrative Expenses		<u>363</u>
TOTAL	\$	<u>41,704</u>

<u>Excess of Additions Over Deductions</u>	<u>\$</u>	<u>11,131</u>
--	-----------	---------------

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2015	\$	456,258
Excess of Additions over Deductions		<u>11,131</u>
Market Value of Assets as of 6/30/2016*	\$	<u>467,389</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, 2016**  
**(\$ in thousands)**

Additions for the Year

Contributions:		
Members	\$	17,564
Members (paid by employer)		10
Employers		<u>79,392</u>
Total	\$	96,966
Miscellaneous Revenue		(38)
Net Investment Income		<u>20,899</u>
TOTAL	\$	<u>117,827</u>

Deductions for the Year

Benefit Payments	\$	92,270
Refunds		4,524
Transfers		-
Administrative Expenses		<u>940</u>
TOTAL	\$	<u>97,734</u>

Excess of Additions Over Deductions \$ 20,093

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2015	\$	1,191,353
Excess of Additions over Deductions		<u>20,093</u>
Market Value of Assets as of 6/30/2016*	\$	<u>1,211,446</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, 2016**  
**(\$ in thousands)**

Additions for the Year

Contributions:		
Members	\$	223,114
Members (paid by employer)		8,820
Employers		<u>543,947</u>
Total	\$	775,881
Miscellaneous Revenue		(130)
Net Investment Income		<u>300,995</u>
TOTAL	\$	<u>1,076,746</u>

Deductions for the Year

Benefit Payments	\$	893,585
Refunds		37,380
Transfers		-
Administrative Expenses		<u>10,696</u>
TOTAL	\$	<u>941,661</u>

Excess of Additions Over Deductions \$ 135,085

Reconciliation of Asset Balances

Market Value of Assets as of 6/30/2015	\$	17,283,021
Excess of Additions over Deductions		<u>135,085</u>
Market Value of Assets as of 6/30/2016*	\$	<u>17,418,106</u>

\*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, 2016**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2015</u>	<u>BOY 2015/2016 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Years Remaining June 30, 2016</u>
2013 Original Unfunded	\$7,117,727,223	\$7,271,305,621	\$414,435,735	\$7,336,850,778	\$426,868,807	27 years
2014 Experience (Gain) / Loss	(\$414,716,278)	(\$412,638,801)	(\$29,944,715)	(\$409,482,672)	(\$30,843,057)	18 years
2015 Experience (Gain) / Loss	(\$637,505,432)	(\$637,505,432)	(\$44,690,557)	(\$634,311,916)	(\$46,031,274)	19 years
2016 Experience (Gain) / Loss	(\$87,589,562)			(\$87,589,562)	(\$6,140,224)	20 years
2011 10 Yr Payback of Contribution Deficit*	\$278,155,318	\$188,799,789	\$37,018,133	\$0		
<b>Total</b>		<b>\$6,409,961,177</b>	<b>\$376,818,596</b>	<b>\$6,205,466,628</b>	<b>\$343,854,252</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2016	\$6,205,466,628
June 30, 2017	\$6,271,925,242
June 30, 2018	\$6,331,998,239
June 30, 2019	\$6,384,907,492
June 30, 2043	\$0

\* 2016-2017 Virginia budget accelerated the payback of the full outstanding balance of the deferred contributions.



Schedule D – Amortization Schedules Unfunded Accrued Liability

**TEACHERS**  
**As of June 30, 2016**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2015</u>	<u>BOY 2015/2016 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Years Remaining June 30, 2016</u>
2013 Original Unfunded	\$14,493,629,234	\$14,806,356,638	\$843,903,916	\$14,939,824,413	\$869,221,034	27 years
2014 Experience (Gain) / Loss	(\$958,176,017)	(\$953,376,135)	(\$69,185,392)	(\$946,084,095)	(\$71,260,953)	18 years
2015 Experience (Gain) / Loss	(\$1,043,509,874)	(\$1,043,509,874)	(\$73,152,377)	(\$1,038,282,522)	(\$75,346,949)	19 years
2016 Experience (Gain) / Loss	(\$411,540,187)			(\$411,540,187)	(\$28,849,888)	20 years
2011 10 Yr Payback of Contribution Deficit	\$741,432,106	\$313,221,882	\$61,413,678	\$269,434,778	\$61,413,678	5 years
<b>Total</b>		<b>\$13,122,692,511</b>	<b>\$762,979,825</b>	<b>\$12,813,352,387</b>	<b>\$755,176,922</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2016	\$12,813,352,387
June 30, 2017	\$12,902,247,748
June 30, 2018	\$12,975,095,984
June 30, 2019	\$13,030,105,703
June 30, 2043	\$0



Schedule D – Amortization Schedules Unfunded Accrued Liability

**STATE POLICE**  
**As of June 30, 2016**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2015</u>	<u>BOY 2015/2016 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Years Remaining June 30, 2016</u>
2013 Original Unfunded	\$385,000,723	\$393,307,840	\$22,416,995	\$396,853,204	\$23,089,505	27 years
2014 Experience (Gain) / Loss	(\$25,215,304)	(\$25,088,991)	(\$1,820,679)	(\$24,897,094)	(\$1,875,299)	18 years
2015 Experience (Gain) / Loss	(\$30,844,770)	(\$30,844,770)	(\$2,162,287)	(\$30,690,257)	(\$2,227,156)	19 years
2016 Experience (Gain) / Loss	(\$3,942,276)			(\$3,942,276)	(\$276,362)	20 years
2011 10 Yr Payback of Contribution Deficit*	\$23,086,069	\$2,463,317	\$482,984	\$0		
<b>Total</b>		<b>\$339,837,396</b>	<b>\$18,917,013</b>	<b>\$337,323,577</b>	<b>\$18,710,688</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2016	\$337,323,577
June 30, 2017	\$340,915,791
June 30, 2018	\$344,158,848
June 30, 2019	\$347,010,287
June 30, 2043	\$0

\* 2016-2017 Virginia budget accelerated the payback of the full outstanding balance of the deferred contributions.



Schedule D – Amortization Schedules Unfunded Accrued Liability

**JUDICIAL**  
**As of June 30, 2016**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2015</u>	<u>BOY 2015/2016 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Years Remaining June 30, 2016</u>
2013 Original Unfunded	\$209,625,821	\$214,148,894	\$12,205,642	\$216,079,280	\$12,571,811	27 years
2014 Experience (Gain) / Loss	(\$21,000,605)	(\$20,895,405)	(\$1,516,355)	(\$20,735,584)	(\$1,561,846)	18 years
2015 Experience (Gain) / Loss	(\$44,957,373)	(\$44,957,373)	(\$3,151,612)	(\$44,732,164)	(\$3,246,161)	19 years
2016 Experience (Gain) / Loss	(\$19,134,811)			(\$19,134,811)	(\$1,341,393)	20 years
2011 10 Yr Payback of Contribution Deficit*	\$14,585,278	\$9,841,569	\$1,929,645	\$0		
<b>Total</b>		<b>\$158,137,685</b>	<b>\$9,467,320</b>	<b>\$131,476,721</b>	<b>\$6,422,411</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2016	\$131,476,721
June 30, 2017	\$133,808,112
June 30, 2018	\$136,096,540
June 30, 2019	\$138,332,813
June 30, 2043	\$0

\* 2016-2017 Virginia budget accelerated the payback of the full outstanding balance of the deferred contributions.



Schedule D – Amortization Schedules Unfunded Accrued Liability

**VIRGINIA LAW OFFICERS**  
**As of June 30, 2016**

<u>Description</u>	<u>Original Amount</u>	<u>Outstanding Balance as of June 30, 2015</u>	<u>BOY 2015/2016 Amortization Payment</u>	<u>Outstanding Balance as of June 30, 2016</u>	<u>BOY 2016/2017 Amortization Payment</u>	<u>Years Remaining June 30, 2016</u>
2013 Original Unfunded	\$759,539,883	\$775,928,389	\$44,224,857	\$782,922,779	\$45,551,603	27 years
2014 Experience (Gain) / Loss	(\$27,744,710)	(\$27,605,726)	(\$2,003,315)	(\$27,394,580)	(\$2,063,415)	18 years
2015 Experience (Gain) / Loss	(\$16,540,081)	(\$16,540,081)	(\$1,159,497)	(\$16,457,225)	(\$1,194,282)	19 years
2016 Experience (Gain) / Loss	\$9,695,693			\$9,695,693	\$679,690	20 years
2011 10 Yr Payback of Contribution Deficit*	\$48,155,379	\$19,171,679	\$3,759,007	\$0		
<b>Total</b>		<b>\$750,954,261</b>	<b>\$44,821,052</b>	<b>\$748,766,667</b>	<b>\$42,973,596</b>	

<u>Date</u>	<u>Projected Unfunded Liability</u>
June 30, 2016	\$748,766,667
June 30, 2017	\$755,198,586
June 30, 2018	\$760,701,287
June 30, 2019	\$765,168,340
June 30, 2043	\$0

\* 2016-2017 Virginia budget accelerated the payback of the full outstanding balance of the deferred contributions.



## Schedule E – Outline of Actuarial Assumptions and Methods

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

<b>Investment Return Rate:</b>	7.00% per annum, compounded annually, net of investment expenses.
<b>Inflation Assumption:</b>	2.50% per year.
<b>Actuarial Cost Method:</b>	Entry age normal cost method. Actuarial gains and losses are reflected in the unfunded actuarial accrued liability. See Schedule F for a detailed explanation.
<b>Funding Period:</b>	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(I)(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.
<b>Payroll Growth Rate:</b>	3% per annum.
<b>Asset Valuation Method:</b>	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.
<b>Cost-of-living Increase:</b>	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.
<b>Percent Electing a Deferred Termination Benefit:</b>	Terminating members are assumed to elect a return of contributions or a deferred annuity, whichever is most valuable benefit at the time of termination. Termination benefits are assumed to commence at normal retirement age.
<b>Marriage Assumption:</b>	100% of active employees are assumed to be married, with spouses the same age as participants.





## Schedule E – Outline of Actuarial Assumptions and Methods

---

<b>Plan 1:</b>	Members hired prior to July 1, 2010 and who were vested as of January 1, 2013.
<b>Plan 2:</b>	Members hired on or after July 1, 2010 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.
<b>Hybrid:</b>	Members hired on or after January 1, 2014 or by member election. There is no Hybrid Plan in the State Police and Virginia Law Officers Plans.
<b>Service Related Disability:</b>	The service related disability benefits do not include an adjustment for Social Security or Worker's Compensation benefits.
<b>Hazardous Duty Service:</b>	The valuations of SPORS and VaLORS assume that all VRS service is hazardous duty service for purposes of determining eligibility for the temporary supplement.
<b>Administrative Expenses:</b>	The employer contribution rates include a rate for anticipated non-investment expenses.



Schedule E – State Employees’ Actuarial Assumptions and Methods

**STATE EMPLOYEES**  
**Plan Specific Assumptions and Methods**

**MORTALITY RATES:**

Pre-Retirement:

RP-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 2 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00026	0.00024	0.02257	0.00014	0.00014	0.00745
25	0.00035	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00051	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00082	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00099	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00128	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00163	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00258	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00437	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00662	0.00961	0.04498	0.00421	0.00780	0.02803
70	0.00953	0.01641	0.05445	0.00596	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

14% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale AA.



***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				
Age	Males		Females	
	Years of Service			
	0-29	>=30	0-29	>=30
<=49	0.000	0.000	0.000	0.000
50	0.030	0.100	0.032	0.100
51	0.030	0.100	0.031	0.100
52	0.030	0.100	0.030	0.100
53	0.030	0.100	0.030	0.100
54	0.030	0.100	0.035	0.100
55	0.050	0.100	0.050	0.100
56	0.050	0.100	0.050	0.100
57	0.045	0.100	0.045	0.100
58	0.040	0.100	0.055	0.100
59	0.050	0.100	0.055	0.100
60	0.050	0.100	0.055	0.150
61	0.100	0.150	0.100	0.200
62	0.150	0.250	0.150	0.300
63	0.150	0.200	0.150	0.200
64	0.150	0.200	0.150	0.200
65	0.300	0.300	0.300	0.400
66	0.300	0.250	0.300	0.300
67	0.300	0.250	0.300	0.250
68	0.300	0.200	0.300	0.250
69	0.300	0.200	0.300	0.200
>=70	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 & Hybrid														
Age	Males													
	Years of Service													
	0-4	5-26 *	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
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	0.350
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	0.350	0.100
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100
57	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100
58	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
59	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
60	0.000	0.050	0.050	0.050	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
61	0.000	0.100	0.100	0.150	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	0.150	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	0.150	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
64	0.000	0.150	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
65	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
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	0.250
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	0.250
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	0.200
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	0.200
>=70	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

\*Rate is 35% when age plus service equals 90.



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

State Employees Retirement Rates, Plan 2 & Hybrid															
Age	Females														
	Years of Service														
	0-4	5-25 *	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
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	0.350
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	0.350	0.100
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	0.350	0.100	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	0.350	0.100	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	0.350	0.100	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	0.350	0.100	0.100	0.100	0.100	0.100
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100
58	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
59	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
60	0.000	0.055	0.055	0.055	0.350	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
61	0.000	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
62	0.000	0.150	0.150	0.300	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	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
64	0.000	0.150	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
65	0.000	0.300	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
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
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	0.250
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	0.250
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	0.200
>=70	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

\*Rate is 35% when age plus service equals 90.



Schedule E – State Employees’ Actuarial Assumptions and Methods

**DISABILITY RATES:** As shown below for selected ages. 14% of disability cases are assumed to be service related.

State Employees Disability Rates		
Age	Male	Female
20	0.00090	0.00010
25	0.00090	0.00100
30	0.00180	0.00150
35	0.00180	0.00250
40	0.00180	0.00290
45	0.00360	0.00340
50	0.00450	0.00550
55	0.00540	0.00810
60	0.00720	0.01000
65	0.00630	0.00900
70	0.00630	0.00000



### 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 Rates of Termination, Plan 1								
Age	Male				Female			
	Years of Service							
	0-2	3-4	5-9	>=10	0-2	3-4	5-9	>=10
20	0.245	0.175	0.175	0.000	0.283	0.198	0.198	0.000
25	0.221	0.130	0.130	0.000	0.256	0.157	0.157	0.000
30	0.199	0.110	0.110	0.050	0.212	0.130	0.130	0.060
35	0.167	0.093	0.093	0.045	0.178	0.110	0.110	0.050
40	0.145	0.075	0.075	0.034	0.155	0.090	0.090	0.036
45	0.129	0.070	0.070	0.023	0.139	0.074	0.074	0.025
50	0.115	0.061	0.061	0.000	0.130	0.063	0.063	0.000
55	0.102	0.060	0.060	0.000	0.125	0.860	0.000	0.000
60	0.106	0.070	0.000	0.000	0.123	0.070	0.000	0.000
65	0.113	0.110	0.000	0.000	0.140	0.120	0.000	0.000
70	0.131	0.140	0.000	0.000	0.249	0.140	0.000	0.000

State Employees Rates of Termination, Plan 2 & Hybrid								
Age	Male				Female			
	Years of Service							
	0-2	3-4	5-9	>=10	0-2	3-4	5-9	>=10
20	0.245	0.175	0.175	0.000	0.283	0.198	0.198	0.000
25	0.221	0.130	0.130	0.000	0.256	0.157	0.157	0.000
30	0.199	0.110	0.110	0.050	0.212	0.130	0.130	0.060
35	0.167	0.093	0.093	0.045	0.178	0.110	0.110	0.050
40	0.145	0.075	0.075	0.034	0.155	0.090	0.090	0.036
45	0.129	0.070	0.070	0.023	0.139	0.074	0.074	0.025
50	0.115	0.061	0.061	0.020	0.130	0.063	0.063	0.020
55	0.102	0.060	0.060	0.004	0.125	0.060	0.060	0.004
60	0.106	0.070	0.000	0.000	0.123	0.070	0.000	0.000
65	0.113	0.110	0.000	0.000	0.140	0.120	0.000	0.000
70	0.131	0.140	0.000	0.000	0.249	0.140	0.000	0.000



### 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 1.46% 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-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set back 3 years and Females set back 5 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Males set back 2 years and Females set back 3 years.

Post-Disablement:

RP-2000 Disabled Life Mortality Table Projected to 2020 with Males set back 1 year and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00021	0.00022	0.01538	0.00012	0.00014	0.00540
25	0.00026	0.00028	0.01737	0.00014	0.00014	0.00562
30	0.00035	0.00036	0.02042	0.00016	0.00018	0.00609
35	0.00051	0.00057	0.02042	0.00022	0.00030	0.00597
40	0.00082	0.00086	0.01961	0.00038	0.00043	0.00551
45	0.00099	0.00104	0.01773	0.00052	0.00063	0.00540
50	0.00128	0.00135	0.01965	0.00081	0.00092	0.00819
55	0.00163	0.00195	0.02280	0.00119	0.00152	0.01409
60	0.00258	0.00382	0.02946	0.00215	0.00315	0.01976
65	0.00437	0.00755	0.03644	0.00356	0.00602	0.02535
70	0.00662	0.01348	0.04497	0.00527	0.01100	0.03405
75		0.02246	0.05729		0.01832	0.04448
80		0.04094	0.08287		0.02964	0.06283
85		0.07640	0.11724		0.04892	0.08884
90		0.13623	0.15309		0.08892	0.13188

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 AA.



*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 Rates of Retirement, Plan 1				
Age	Male		Female	
	Years of Service			
	0-29	>=30	0-29	>=30
<=49	0.000	0.000	0.000	0.000
50	0.020	0.175	0.020	0.150
51	0.020	0.175	0.024	0.150
52	0.020	0.175	0.027	0.150
53	0.023	0.175	0.024	0.150
54	0.040	0.175	0.037	0.150
55	0.057	0.225	0.061	0.225
56	0.046	0.225	0.054	0.225
57	0.045	0.225	0.057	0.225
58	0.066	0.225	0.062	0.225
59	0.070	0.225	0.075	0.225
60	0.075	0.225	0.085	0.225
61	0.110	0.300	0.120	0.300
62	0.170	0.350	0.170	0.350
63	0.140	0.350	0.160	0.350
64	0.180	0.300	0.165	0.350
65	0.300	0.400	0.300	0.350
66	0.300	0.400	0.300	0.350
67	0.300	0.400	0.300	0.350
68	0.300	0.400	0.300	0.350
69	0.300	0.400	0.300	0.350
>=70	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 & Hybrid																	
Age	Males																
	Years of Service																
	0-4	5-21 *	22-23 *	24-25 *	26-27 *	28-29 *	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
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	0.400
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	0.400	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	0.400	0.175	0.175
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	0.400	0.175	0.175	0.175
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	0.400	0.175	0.175	0.175	0.175
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.225	0.225	0.225	0.225	0.225
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.225	0.225	0.225	0.225	0.225	0.225
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.225	0.225	0.225	0.225	0.225	0.225	0.225
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
60	0.000	0.075	0.075	0.075	0.075	0.075	0.400	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
61	0.000	0.110	0.110	0.110	0.110	0.110	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
62	0.000	0.170	0.170	0.170	0.170	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	0.140	0.140	0.140	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
64	0.000	0.180	0.180	0.180	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	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
66	0.000	0.300	0.300	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
67	0.000	0.300	0.300	0.400	0.400	0.400	0.300	0.300	0.300	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
68	0.000	0.300	0.400	0.400	0.400	0.400	0.300	0.300	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
69	0.000	0.300	0.400	0.400	0.400	0.400	0.300	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
>=70	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

\*Rate is 40% when age plus service equals 90.



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

Teachers Retirement Rates, Plan 2 & Hybrid																		
Age	Females																	
	Years of Service																	
	0-4	5-21 *	22	23	24-25 *	26-27 *	28-29 *	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
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	0.350
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	0.350	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	0.350	0.150	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	0.350	0.150	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	0.350	0.150	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	0.350	0.225	0.225	0.225	0.225	0.225
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.225	0.225	0.225	0.225	0.225	0.225
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.225	0.225	0.225	0.225	0.225	0.225	0.225
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
60	0.000	0.085	0.085	0.085	0.085	0.085	0.085	0.350	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
61	0.000	0.120	0.120	0.120	0.120	0.120	0.120	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
62	0.000	0.170	0.170	0.170	0.170	0.170	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.350
63	0.000	0.160	0.160	0.160	0.160	0.160	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.350
64	0.000	0.165	0.165	0.165	0.165	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.350
65	0.000	0.300	0.300	0.300	0.400	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.350
66	0.000	0.300	0.300	0.400	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	0.350
67	0.000	0.300	0.400	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	0.350
68	0.000	0.300	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	0.300	0.350
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	0.350
>=70	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

\*Rate is 35% when age plus service equals 90.



*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	0.00000	0.00000
25	0.00008	0.00004
30	0.00010	0.00010
35	0.00018	0.00030
40	0.00021	0.00036
45	0.00099	0.00042
50	0.00133	0.00090
55	0.00195	0.00204
60	0.00308	0.00240
65	0.00276	0.00330
70	0.00169	0.00180



### 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 Rates of Termination, Plan 1								
Age	Male				Female			
	Years of Service							
	0-2	3-4	5-9	>=10	0-2	3-4	5-9	>=10
20	0.182	0.143	0.143	0.008	0.159	0.160	0.160	0.000
25	0.154	0.118	0.118	0.008	0.146	0.120	0.120	0.150
30	0.149	0.090	0.090	0.037	0.164	0.110	0.110	0.047
35	0.141	0.073	0.073	0.031	0.149	0.090	0.090	0.039
40	0.141	0.070	0.070	0.025	0.127	0.075	0.075	0.028
45	0.147	0.075	0.075	0.019	0.117	0.064	0.064	0.021
50	0.138	0.070	0.070	0.000	0.118	0.058	0.058	0.000
55	0.143	0.070	0.000	0.000	0.124	0.058	0.000	0.000
60	0.166	0.080	0.000	0.000	0.129	0.077	0.000	0.000
65	0.170	0.083	0.000	0.000	0.130	0.080	0.000	0.000
70	0.170	0.083	0.000	0.000	0.130	0.080	0.000	0.000

Teachers Rates of Termination, Plan 2 & Hybrid								
Age	Male				Female			
	Years of Service							
	0-2	3-4	5-9	>=10	0-2	3-4	5-9	>=10
20	0.182	0.143	0.143	0.008	0.159	0.160	0.160	0.000
25	0.154	0.118	0.118	0.008	0.146	0.120	0.120	0.150
30	0.149	0.090	0.090	0.037	0.164	0.110	0.110	0.047
35	0.141	0.073	0.073	0.031	0.149	0.090	0.090	0.039
40	0.141	0.070	0.070	0.025	0.127	0.075	0.075	0.028
45	0.147	0.075	0.075	0.019	0.117	0.064	0.064	0.021
50	0.138	0.070	0.070	0.016	0.118	0.058	0.058	0.018
55	0.143	0.070	0.070	0.003	0.124	0.058	0.058	0.003
60	0.166	0.080	0.000	0.000	0.129	0.077	0.000	0.000
65	0.170	0.083	0.000	0.000	0.130	0.080	0.000	0.000
70	0.170	0.083	0.000	0.000	0.130	0.080	0.000	0.000



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 1.29% 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-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 5 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00031	0.00024	0.02257	0.00014	0.00014	0.00745
25	0.00040	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00070	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00092	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00116	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00149	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00206	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00353	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00571	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00733	0.00961	0.04498	0.00421	0.00780	0.02803
70	0.01869	0.01641	0.05445	0.00596	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

60% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale AA.





Schedule E – State Police Actuarial Assumptions and Methods

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

SPORS Rates of Retirement		
Age	Years of Service	
	Less Than 25	25 or More
<=49	0.000	0.000
50	0.100	0.150
51	0.100	0.150
52	0.100	0.150
53	0.100	0.150
54	0.100	0.150
55	0.100	0.150
56	0.100	0.150
57	0.100	0.150
58	0.120	0.200
59	0.120	0.200
60	0.250	0.400
61	0.350	0.400
62	0.500	1.000
63	0.500	1.000
>=64	1.000	1.000



## Schedule E – State Police Actuarial Assumptions and Methods

**DISABILITY RATES:** As shown below for selected ages. 60% of disability cases are assumed to be service related.

SPORS Rates of Disability	
Age	Unisex
<=29	0.00000
30	0.00028
35	0.00134
40	0.00210
45	0.00411
50	0.00675
55	0.01001
60	0.00000

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

SPORS Rates of Termination								
Age	Males				Females			
	Years of Service							
	0-2	3-4	5-9	>=10	2	5	9	>=10
20	0.075	0.210	0.210	0.030	0.101	0.122	0.053	0.036
25	0.075	0.055	0.055	0.030	0.108	0.105	0.054	0.044
30	0.075	0.045	0.045	0.030	0.119	0.084	0.057	0.055
35	0.075	0.048	0.048	0.024	0.121	0.074	0.060	0.061
40	0.075	0.048	0.048	0.018	0.117	0.074	0.062	0.062
45	0.100	0.045	0.045	0.014	0.108	0.082	0.064	0.059
50	0.100	0.045	0.000	0.000	0.093	0.100	0.066	0.052
55	0.100	0.067	0.000	0.000	0.074	0.126	0.067	0.041
60	0.100	0.075	0.000	0.000	0.049	0.162	0.068	0.026
65	0.100	0.075	0.000	0.000	0.015	0.205	0.069	0.006
70	0.100	0.075	0.000	0.000	0.000	0.264	0.071	0.000



### 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-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 2 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00026	0.00024	0.02257	0.00014	0.00014	0.00745
25	0.00035	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00051	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00082	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00099	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00128	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00163	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00258	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00437	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00662	0.00961	0.04498	0.00421	0.00780	0.02803
70	0.00953	0.01641	0.05445	0.00596	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

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 AA.



**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 Rates of Retirement								
Age	Service Multiplier = 1.5 Years of Service				Service Multiplier = 2.0 Years of Service			
	<=1	2 - 19	20	>=21	<=1	2 - 14	15	>=16
<=59	0	0	0	0	0	0	0	0
60	0	0	0.500	0.500	0	0	0.500	0.500
61	0	0	0.500	0.150	0	0	0.500	0.150
62	0	0	0.500	0.150	0	0	0.500	0.150
63	0	0	0.500	0.150	0	0	0.500	0.150
64	0	0	0.500	0.150	0	0	0.500	0.150
65	0	0.500	0.500	0.150	0	0.500	0.500	0.150
66	0	0.150	0.150	0.150	0	0.150	0.150	0.150
67	0	0.150	0.150	0.150	0	0.150	0.150	0.150
68	0	0.150	0.150	0.150	0	0.150	0.150	0.150
69	0	0.150	0.150	0.150	0	0.150	0.150	0.150
70	0	0.150	0.150	0.150	0	0.150	0.150	0.150
71	0	0.150	0.150	0.150	0	0.150	0.150	0.150
72	0	0.150	0.150	0.150	0	0.150	0.150	0.150
>=73	0	1.000	1.000	1.000	0	1.000	1.000	1.000

Judicial Rates of Retirement								
Age	Service Multiplier = 2.5 Years of Service				Service Multiplier = 3.5 Years of Service			
	<=1	2 - 11	12	>=13	<1	1 - 8	9	>=10
<=59	0	0	0	0	0	0	0	0
60	0	0	0.500	0.500	0	0	0.500	0.500
61	0	0	0.500	0.150	0	0	0.500	0.150
62	0	0	0.500	0.150	0	0	0.500	0.150
63	0	0	0.500	0.150	0	0	0.500	0.150
64	0	0	0.500	0.150	0	0	0.500	0.150
65	0	0.500	0.500	0.150	0	0.500	0.500	0.150
66	0	0.150	0.150	0.150	0	0.150	0.150	0.150
67	0	0.150	0.150	0.150	0	0.150	0.150	0.150
68	0	0.150	0.150	0.150	0	0.150	0.150	0.150
69	0	0.150	0.150	0.150	0	0.150	0.150	0.150
70	0	0.150	0.150	0.150	0	0.150	0.150	0.150
71	0	0.150	0.150	0.150	0	0.150	0.150	0.150
72	0	0.150	0.150	0.150	0	0.150	0.150	0.150
>=73	0	1.000	1.000	1.000	0	1.000	1.000	1.000



### Schedule E – Judicial Actuarial Assumptions and Methods

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

Judical Rates of Disability		
Age	Male	Female
<=29	0.00000	0.00000
30	0.00007	0.00007
35	0.00037	0.00045
40	0.00142	0.00090
45	0.00292	0.00210
50	0.00480	0.00397
55	0.00712	0.00600
60	0.00000	0.00000

**TERMINATION RATES:** There are no assumed rates of withdrawal prior to service retirement. (For causes other than death, disability, 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 2.63% 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-2000 Employee Mortality Table Projected with Scale AA to 2020 with Males set forward 5 years and Females set back 3 years.

Post-Retirement:

RP-2000 Combined Mortality Table Projected with Scale AA to 2020 with Females set back 1 year.

Post-Disablement:

RP-2000 Disabled Life Mortality Table with Males set back 3 years and no provision for future mortality improvement.

Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00031	0.00024	0.02257	0.00014	0.00014	0.00745
25	0.00040	0.00031	0.02257	0.00014	0.00015	0.00745
30	0.00070	0.00040	0.02257	0.00018	0.00020	0.00745
35	0.00092	0.00070	0.02257	0.00030	0.00036	0.00745
40	0.00116	0.00092	0.02257	0.00043	0.00048	0.00745
45	0.00149	0.00116	0.02257	0.00063	0.00076	0.00745
50	0.00206	0.00149	0.02512	0.00092	0.00108	0.01154
55	0.00353	0.00247	0.03156	0.00148	0.00198	0.01654
60	0.00571	0.00489	0.03803	0.00272	0.00402	0.02184
65	0.00733	0.00961	0.04498	0.00421	0.00780	0.02803
70	0.01869	0.01641	0.05445	0.00596	0.01344	0.03764
75		0.02854	0.06941		0.02212	0.05223
80		0.05265	0.09215		0.03607	0.07231
85		0.09624	0.12188		0.06041	0.10020
90		0.16928	0.15524		0.11221	0.14005

60% of pre-retirement deaths are assumed to be service related. Mortality improvement is anticipated under the post-retirement mortality assumption as projected with Scale AA.



Schedule E – Virginia Law Officers’ Actuarial Assumptions and Methods

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

VaLORS Rates of Retirement		
Age	Years of Service	
	Less Than 25	25 or More
<=49	0.000	0.000
50	0.092	0.250
51	0.090	0.250
52	0.090	0.250
53	0.090	0.250
54	0.100	0.250
55	0.095	0.250
56	0.090	0.250
57	0.120	0.300
58	0.100	0.300
59	0.120	0.400
60	0.200	0.400
61	0.260	0.500
62	0.400	1.000
63	0.200	1.000
64	0.200	1.000
>=65	1.000	1.000





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

**DISABILITY RATES:** As shown below for selected ages. 50% of disability cases are assumed to be service related.

VaLORS Rates of Disability	
Age	Unisex
20	0.00150
25	0.00300
30	0.00600
35	0.00800
40	0.00800
45	0.01000
50	0.01200
55	0.01200
60	0.01000
65	0.00800
70	0.00600

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

VaLORS Rates of Termination						
Age	Males			Females		
	Years of Service			Years of Service		
	0-2	3-9	>=10	0-2	3-9	>=10
20	0.250	0.150	0.050	0.200	0.150	0.075
25	0.200	0.150	0.050	0.200	0.150	0.075
30	0.200	0.125	0.050	0.200	0.125	0.060
35	0.200	0.125	0.050	0.200	0.125	0.060
40	0.150	0.105	0.040	0.175	0.105	0.050
45	0.150	0.105	0.040	0.175	0.080	0.040
50	0.150	0.080	0.040	0.175	0.080	0.040
55	0.120	0.065	0.040	0.100	0.120	0.040
60	0.125	0.070	0.040	0.100	0.200	0.040
65	0.150	0.070	0.040	0.100	0.100	0.040
70	0.200	0.070	0.040	0.100	0.100	0.040



### 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(l)(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(l)(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

2. 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

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



## *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 Plan Provisions

---

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

<b>Plan Year:</b>	Twelve-month period ending June 30th.
<b>Administration:</b>	All plans are administered by the Board of Trustees of the Virginia Retirement System.
<b>Plan 1:</b>	Members hired prior to July 1, 2010 and who were vested as of January 1, 2013.
<b>Plan 2:</b>	Members hired on or after July 1, 2010 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.
<b>Hybrid:</b>	Members hired on or after January 1, 2014 or by member election. There is no Hybrid Plan in the State Police and Virginia Law Officers Plans.
<b>Eligibility:</b>	All full-time, salaried, permanent employees of the Commonwealth of Virginia or of any participating Virginia city, county, town or political subdivision or of any local Virginia school boards are eligible to become members of VRS. This summary covers the provisions relating to state employees.
<b>Employee Contributions:</b>	
<b>Defined Benefit -</b>	Active members in Plan 1 and Plan 2 contribute 5.00% 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).
<b>Defined Contribution -</b>	Active members in the Hybrid Plan are required to contribute 1% of their creditable compensation per year to the defined contribution component of the Hybrid Plan. Active members can make voluntary additional contributions of up to 4% of their creditable compensation.
<b>Creditable Compensation:</b>	Annual salary minus any overtime pay, payments of a temporary nature, or payments for extra duties.
<b>Optional Forms of Payment:</b>	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.



## Schedule G – Summary of Plan Provisions

---

### 50% Survivor Option:

Payable for the member's life. 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:**

Plan1: The average of the member's highest 36 consecutive months of salary.

Plan 2 & 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

### **Early Retirement:**

Plan 1:

Eligibility:

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

Annual Benefit:

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

Payment Form:

Same as for Normal Retirement above.

Plan 2 & Hybrid:

Eligibility:

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

Annual Benefit:

Calculated the same as the normal retirement benefit, using actual service at retirement and multiplied by a reduction factor. 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 – State Employees' Plan Provisions

---

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

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

### Annual Benefit:

For members with less than five years of service credit, the minimum guaranteed benefit. For members with greater than five years of service credit, the greater of the minimum guaranteed benefit and 1.7% 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 lump sum to the member's beneficiary. 100% and 50% Survivor Options are also permitted for disability retirement. (A refund of the member's contribution account is paid out for a work-related disability.)



## Schedule G – State Employees’ Plan Provisions

### **Disability Retirement – VSDP:**

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

### **Deferred Termination Benefit:**

#### **Plan 1:**

#### **Eligibility:**

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

#### **Annual Benefit:**

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

#### **Payment Form:**

Same as for Normal Retirement above.

#### **Death Benefit:**

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



## Schedule G – State Employees' Plan Provisions

---

### Plan 2 & Hybrid:

#### Eligibility:

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

#### Annual Benefit:

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

#### Payment Form:

Same as for Normal Retirement above.

#### Death Benefit:

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

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

#### Eligibility:

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

#### Benefit:

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



## Schedule G – State Employees' Plan Provisions

### **Death Benefit:**

#### **Eligibility:**

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

#### **Benefit:**

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

#### **Work-Related Death:**

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

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

#### **Plan 1:**

Members qualify for cost-of-living increase 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 & Hybrid:**

Members qualify for cost-of-living increase 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**

<b>Effective Date:</b>	March 1, 1952
<b>Type of Plan:</b>	VRS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered an agent multiple-employer PERS with separate cost-sharing pools for state employees and teachers.
<b>Service:</b>	Employees receive credit of one month of service for each month a contribution is made on their behalf to VRS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (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.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member's highest 36 consecutive months of salary.
Plan 2 & Hybrid:	The average of the member's highest 60 consecutive months of salary.
<b>Normal Retirement:</b>	
Plan 1:	Eligibility:  A member may retire upon Normal Retirement on or after age 65 with credit for 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 & 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 (1.65% for Plan 2 members). Benefit is reduced by Worker's Compensation (if any).

#### Minimum Guaranteed Benefit:

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

#### Service Credit:

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

#### Payment Form:

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



## Schedule G – Teachers’ Plan Provisions

---

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

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

### **Deferred Termination Benefit:**

#### **Plan 1:**

#### **Eligibility:**

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

#### **Annual Benefit:**

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

#### **Payment Form:**

Same as for Normal Retirement above.

#### **Death Benefit:**

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

#### **Plan 2 & Hybrid:**

#### **Eligibility:**

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



## Schedule G – Teachers’ Plan Provisions

---

### Annual Benefit:

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

### Payment Form:

Same as for Normal Retirement above.

### Death Benefit:

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

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

#### Eligibility:

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

#### Benefit:

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

### **Death Benefit:**

#### Eligibility:

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

#### 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



## Schedule G – Teachers’ Plan Provisions

---

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 increase 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 & Hybrid:	Members qualify for cost-of-living increase 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**

<b>Effective Date:</b>	July 1, 1950
<b>Type of Plan:</b>	SPORS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.
<b>Service:</b>	Employees receive credit of one month of service for each month a contribution is made on their behalf to SPORS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (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.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member's highest 36 consecutive months of salary.
Plan 2:	The average of the member's highest 60 consecutive months of salary.
<b>Normal Retirement:</b>	Eligibility:  A member may retire upon Normal Retirement on or after age 60 with credit for 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 \$13,548 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 \$13,548 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.





## Schedule G – State Police 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.)

### **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.



## Schedule G – State Police Plan Provisions

---

### 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, 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 increase 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 increase 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**

<b>Effective Date:</b>	July 1, 1970
<b>Type of Plan:</b>	JRS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.
<b>Service:</b>	
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 or 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 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.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member's highest 36 consecutive months of salary.
Plan 2:	The average of the member's highest 60 consecutive months of salary.



## Schedule G – Judicial Plan Provisions

---

### **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 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.



## Schedule G – Judicial Plan Provisions

---

### 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% for members appointed or elected on or after January 1, 2013 and 1.0% for members 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.

### Payment Form:

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



## Schedule G – Judicial Plan Provisions

---

### **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.

### **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



## Schedule G – Judicial Plan Provisions

---

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.

### Cost-of-Living Increase:

Plan 1:	Members qualify for cost-of-living increase 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 increase 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**

<b>Effective Date:</b>	October 1, 1999
<b>Type of Plan:</b>	VaLORS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.
<b>Service:</b>	Employees receive credit of one month of service for each month a contribution is made on their behalf to VaLORS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (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.
<b>Average Final Compensation:</b>	
Plan 1:	The average of the member’s highest 36 consecutive months of salary.
Plan 2:	The average of the member’s highest 60 consecutive months of salary.
<b>Normal Retirement:</b>	<p>Eligibility:</p> <p>A member may retire upon Normal Retirement on or after age 60 with credit for 5 years of service.</p> <p>Annual Benefit:</p> <p>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.</p> <p>Employees hired before July 1, 2001, must make a one-time election to receive benefits under (i) or (ii) below:</p> <ul style="list-style-type: none"><li>(i) 1.7% of average final compensation (AFC) times years of service plus the temporary supplement described in 5(d).</li><li>(ii) 2.0% of average final compensation (AFC) times years of service and no temporary supplement.</li></ul>



## 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 \$13,548 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 \$13,548 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).

### 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.



## Schedule G – Virginia Law Officers’ Plan Provisions

### Service Credit:

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

### Payment Form:

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

### Disability Retirement – VSDP:

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

### Deferred Termination Benefit:

#### Eligibility:

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

#### Annual Benefit:

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



## Schedule G – Virginia Law Officers' Plan Provisions

### Payment Form:

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

### Death Benefit:

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

### Withdrawal (Refund) Benefit:

#### Eligibility:

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

#### Benefit:

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

### Death Benefit:

#### Eligibility:

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

#### Benefit:

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



## Schedule G – Virginia Law Officers' 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 increase 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 increase on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%.
- Plans 1 & 2: The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within 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.

### **2006 Valuation**

No material changes were made to the plan provisions.





## Schedule G – Summary of Plan Changes

---

### **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 contributions of up 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%



### *Schedule G – Summary of Plan Changes*

---

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, 2016**

Attained Age	Completed Years of Service								Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total	
Under 20	45	0	0	0	0	0	0	45	\$ 1,114,115
20 to 24	1,562	9	0	0	0	0	0	1,571	\$ 49,956,157
25 to 29	4,632	534	15	0	0	0	0	5,181	\$ 201,004,808
30 to 34	4,099	1,966	601	5	0	0	0	6,671	\$ 305,551,609
35 to 39	3,377	2,119	1,431	418	13	0	0	7,358	\$ 372,364,986
40 to 44	2,824	1,923	1,551	1,108	282	8	0	7,696	\$ 410,838,647
45 to 49	2,650	2,015	1,860	1,482	962	547	36	9,552	\$ 520,295,820
50 to 54	2,363	1,943	1,743	1,708	1,189	1,512	794	11,252	\$ 618,099,093
55 to 59	1,814	1,754	1,760	1,639	1,152	1,525	2,222	11,866	\$ 670,883,632
60	277	318	330	271	243	268	505	2,212	\$ 127,855,504
61	274	275	297	295	242	243	545	2,171	\$ 125,267,886
62	181	252	250	276	199	205	481	1,844	\$ 111,622,148
63	159	226	251	246	179	197	458	1,716	\$ 104,311,333
64	108	153	196	226	173	177	392	1,425	\$ 87,888,078
65	103	154	152	179	136	151	311	1,186	\$ 73,260,118
66	69	86	123	127	79	90	222	796	\$ 51,773,047
67	34	76	82	74	57	80	169	572	\$ 38,973,235
68	29	62	75	71	44	54	142	477	\$ 32,907,015
69	20	49	55	72	41	34	121	392	\$ 26,023,331
70 & Over	51	75	128	139	86	105	401	985	\$ 72,486,650
Total	24,671	13,989	10,900	8,336	5,077	5,196	6,799	74,968	\$ 4,002,477,212

Average Age: 48.22

Average Service: 12.48



*Schedule H – Schedule of Active Member Data*

**TEACHERS**  
**As of June 30, 2016**

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	15	0	0	0	0	0	0	15	\$ 352,233
20 to 24	3,584	8	0	0	0	0	0	3,592	\$ 141,400,641
25 to 29	11,853	3,308	5	0	0	0	0	15,166	\$ 667,372,421
30 to 34	5,934	7,977	3,254	6	0	0	0	17,171	\$ 812,808,636
35 to 39	4,264	4,145	7,263	2,058	7	0	0	17,737	\$ 899,668,064
40 to 44	4,060	3,520	4,457	5,278	1,285	3	0	18,603	\$ 978,076,520
45 to 49	4,106	3,937	4,457	4,027	3,843	1,186	10	21,566	\$ 1,155,597,927
50 to 54	2,869	3,379	4,336	3,421	2,212	2,692	1,004	19,913	\$ 1,054,933,045
55 to 59	1,782	2,393	3,632	3,595	2,165	1,947	2,700	18,214	\$ 985,897,512
60	241	330	542	585	444	377	524	3,043	\$ 168,915,600
61	212	268	499	618	427	359	552	2,935	\$ 167,569,656
62	174	229	472	486	393	337	422	2,513	\$ 145,936,826
63	130	203	320	439	341	316	404	2,153	\$ 125,294,649
64	111	165	331	367	286	243	351	1,854	\$ 107,987,845
65	83	129	236	270	215	178	266	1,377	\$ 78,522,683
66	47	106	146	172	134	121	194	920	\$ 53,228,913
67	45	66	116	124	94	80	128	653	\$ 37,456,385
68	33	59	82	95	51	59	96	475	\$ 26,664,885
69	32	31	71	69	48	47	58	356	\$ 19,863,187
70 & Over	61	69	129	136	91	89	187	762	\$ 39,276,686
Total	39,636	30,322	30,348	21,746	12,036	8,034	6,896	149,018	\$ 7,666,824,314

Average Age: 45.11

Average Service: 11.89



*Schedule H – Schedule of Active Member Data*

**STATE POLICE  
As of June 30, 2016**

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	67	0	0	0	0	0	0	67	\$ 2,609,582
25 to 29	223	53	0	0	0	0	0	276	\$ 12,021,882
30 to 34	83	124	88	0	0	0	0	295	\$ 14,294,458
35 to 39	30	43	155	43	0	0	0	271	\$ 14,657,493
40 to 44	22	24	75	132	31	0	0	284	\$ 16,646,624
45 to 49	16	15	54	67	90	45	3	290	\$ 18,831,414
50 to 54	8	20	20	16	43	111	32	250	\$ 18,473,308
55 to 59	3	2	6	18	9	24	77	139	\$ 11,287,616
60	0	0	2	1	1	0	13	17	\$ 1,378,327
61	0	0	2	1	1	0	13	17	\$ 1,409,443
62	0	0	0	1	0	0	6	7	\$ 721,277
63	0	0	1	0	0	0	6	7	\$ 590,812
64	0	0	1	0	0	0	4	5	\$ 476,438
65	0	0	0	0	0	0	6	6	\$ 603,668
66	0	0	0	0	0	0	2	2	\$ 213,736
67	0	0	0	0	0	0	3	3	\$ 275,231
68	0	0	0	0	0	0	1	1	\$ 85,754
69	0	0	0	0	0	0	3	3	\$ 299,778
70 & Over	0	0	0	0	0	0	0	0	\$ -
Total	452	281	404	279	175	180	169	1,940	\$ 114,876,841

Average Age: 41.28

Average Service: 14.42



*Schedule H – Schedule of Active Member Data*

**JUDICIAL**  
**As of June 30, 2016**

Attained Age	Completed Years of Service								Payroll
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total	
Under 20	0	0	0	0	0	0	0	0	\$ -
20 to 24	0	0	0	0	0	0	0	0	\$ -
25 to 29	0	0	0	0	0	0	0	0	\$ -
30 to 34	1	0	0	0	0	0	0	1	\$ 149,531
35 to 39	7	0	0	0	0	0	0	7	\$ 1,079,927
40 to 44	17	4	0	0	0	0	0	21	\$ 3,276,477
45 to 49	28	11	4	1	0	0	0	44	\$ 6,832,582
50 to 54	29	15	14	3	0	0	0	61	\$ 9,566,357
55 to 59	31	15	22	11	11	0	0	90	\$ 14,305,894
60	8	3	5	5	1	0	0	22	\$ 3,515,954
61	7	4	5	3	0	1	0	20	\$ 3,173,275
62	7	2	6	4	3	2	0	24	\$ 3,758,704
63	3	2	5	4	3	2	0	19	\$ 3,023,777
64	5	3	5	5	4	3	0	25	\$ 3,920,930
65	7	5	2	5	4	0	0	23	\$ 3,607,825
66	1	1	2	3	2	2	1	12	\$ 1,914,750
67	0	3	1	6	1	2	0	13	\$ 2,065,085
68	0	3	2	2	5	0	0	12	\$ 1,860,792
69	1	1	5	6	2	1	1	17	\$ 2,691,472
70 & Over	1	0	0	0	1	2	1	5	\$ 780,865
Total	153	72	78	58	37	15	3	416	\$ 65,524,197

Average Age: 58.03

Average Service: 9.96



*Schedule H – Schedule of Active Member Data*

**VIRGINIA LAW OFFICERS  
As of June 30, 2016**

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	34	0	0	0	0	0	0	34	\$ 1,011,458
20 to 24	889	6	0	0	0	0	0	895	\$ 28,372,426
25 to 29	1,159	190	5	0	0	0	0	1,354	\$ 45,751,066
30 to 34	646	420	143	1	0	0	0	1,210	\$ 44,228,424
35 to 39	399	267	238	130	1	0	0	1,035	\$ 39,561,230
40 to 44	304	265	234	263	112	3	0	1,181	\$ 47,418,656
45 to 49	214	236	250	270	250	84	2	1,306	\$ 55,221,785
50 to 54	156	188	208	200	164	73	26	1,015	\$ 43,561,823
55 to 59	76	154	134	168	90	29	29	680	\$ 29,417,163
60	9	14	23	20	6	5	8	85	\$ 3,708,532
61	8	9	23	28	10	1	10	89	\$ 4,075,683
62	6	11	14	18	6	3	7	65	\$ 3,072,154
63	6	5	12	7	11	3	5	49	\$ 2,249,207
64	3	6	10	5	4	4	2	34	\$ 1,528,952
65	2	3	7	4	3	3	2	24	\$ 1,087,710
66	0	5	2	3	3	2	0	15	\$ 681,730
67	1	0	1	0	1	0	1	4	\$ 178,711
68	0	4	2	2	1	2	2	13	\$ 637,492
69	0	1	2	1	0	0	0	4	\$ 162,127
70 & Over	0	2	3	1	3	1	4	14	\$ 750,848
Total	3,912	1,786	1,311	1,121	665	213	98	9,106	\$ 352,677,177

Average Age: 40.21

Average Service: 8.80





*Schedule I – Schedule of Retiree and Beneficiary Data*

**RETIREE AND BENEFICIARY DATA**  
**As of June 30, 2016**

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	52,702	3,338	1,734	54,306	\$1,172,004	\$1,126,274	4.1%	\$ 21,581	\$ 21,371	1.0%
Teacher	80,717	5,085	1,733	84,069	2,000,999	1,923,884	4.0%	23,802	23,835	-0.1%
Political	46,549	4,021	1,477	49,093	860,954	804,793	7.0%	17,537	17,289	1.4%
Total VRS	179,968	12,444	4,944	187,468	\$ 4,033,957	\$3,854,951	4.6%	\$ 21,518	\$ 21,420	0.5%
State Police	1,271	45	36	1,280	51,432	51,169	0.5%	40,181	40,259	-0.2%
VaLORS	3,826	365	67	4,124	89,700	84,386	6.3%	21,751	22,056	-1.4%
Judicial	511	26	20	517	39,788	38,773	2.6%	76,959	75,877	1.4%
Totals	185,576	12,880	5,067	193,389	\$ 4,214,877	\$4,029,279	4.6%	\$ 21,795	\$ 21,712	0.4%

**CHANGE IN ALLOWANCES FOR RETIREES AND BENEFICIARIES**  
**As of June 30, 2016**

	Prior Year Annual Allowances	COLA	Additions	Deletions	Current Year Annual Allowances
State	\$ 1,126,274	\$ 1,352	\$ 77,014	\$ 32,636	\$ 1,172,004
Teacher	1,923,884	2,309	113,481	38,675	2,000,999
Political	804,793	966	76,888	21,693	860,954
Total VRS	\$ 3,854,951	\$ 4,627	\$ 267,383	\$ 93,004	\$ 4,033,957
State Police	51,169	61	1,714	1,512	51,432
VaLORS	84,386	101	7,950	2,737	89,700
Judges	38,773	47	2,285	1,317	39,788
Totals	\$ 4,029,279	\$ 4,836	\$ 279,332	\$ 98,570	\$ 4,214,877