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Virginia Retirement System

GASB STATEMENT NO. 67 REPORT
FOR THE
VIRGINIA RETIREMENT SYSTEM
PREPARED AS OF JUNE 30, 2019





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

February 7, 2020

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

Ladies and Gentlemen:

Presented in this report is information to assist the Virginia Retirement System in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statement No. 67. The information is presented for the period ending June 30, 2019.

The annual actuarial valuation used as a basis for much of the information presented in this report was performed as of June 30, 2018. The valuation was based upon data, furnished by the Virginia Retirement System staff, concerning active, inactive and retired members along with pertinent financial information. The VRS Board of Trustees adopted a 6.75% investment rate of return since the prior measurement date. This rate was used to develop the liabilities for the period ending June 30, 2019.

To the best of our knowledge, this report is complete and accurate. The necessary calculations were performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems.

The calculations were prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, and, in our opinion, meet the requirements of GASB 67.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the System and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System. In addition, the calculations were completed in compliance with the laws governing the System. 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 opinions contained herein.



Board of Trustees

February 7, 2020

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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.

Respectfully submitted,

A handwritten signature in blue ink, appearing to be 'LL'.

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

A handwritten signature in blue ink, appearing to be 'Wendy Ludbrook'.

Wendy Ludbrook, FSA, EA, MAAA
Senior Actuary

A handwritten signature in blue ink, appearing to be 'Micki R. Taylor'.

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



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**REPORT OF THE ANNUAL GASB STATEMENT NO. 67
REQUIRED INFORMATION FOR THE
VIRGINIA RETIREMENT SYSTEM
PREPARED AS OF JUNE 30, 2019**

SECTION I – INTRODUCTION

The Governmental Accounting Standards Board issued Statement No. 67 (GASB 67), “*Financial Reporting For Pension Plans*,” in June 2012. GASB 67’s effective date is for plan years beginning after June 15, 2013. This report, prepared as of June 30, 2019 (the Measurement Date), presents information to assist the Virginia Retirement System (VRS) in meeting the requirements of GASB 67. Much of the material provided in this report is based on the data used for the annual actuarial valuations of the Virginia Retirement System as of June 30, 2018. The VRS Board of Trustees adopted a 6.75% investment rate of return since the prior measurement date. This rate was used to develop the liabilities as of the measurement date. The results of the June 30, 2018 valuations for the following divisions of VRS were detailed in a report dated February 20, 2019.

- 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, 2018. We have prepared, and provided separately, actuarial valuation reports as of June 30, 2018 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. For new locals where an actuarial valuation report was not prepared as of June 30, 2018, we have set the TPL at zero.

GASB 67 replaces GASB 25 and represents a significant departure from the requirements of that older statement. GASB 25 was issued as a funding friendly statement that required pension plans to report items consistent with the results of the plan’s actuarial valuations, as long as those valuations met certain parameters. GASB 67 basically divorces accounting and funding, creating disclosure and reporting requirements that may or may not be consistent with the basis used for funding the System.

A major change in GASB 67 is the requirement to determine the Total Pension Liability (TPL) utilizing the Entry Age Normal actuarial funding method. The Net Pension Liability (NPL) is then set equal to the TPL minus the System’s Fiduciary Net Position (FNP) (basically the market values



of assets). The benefit provisions recognized in the calculation of the TPL are summarized in Schedule B. As mentioned above, for the Political Subdivision plans please refer to the individual reports for a summary of their benefit provisions.

Among the assumptions needed for the liability calculation is a Single Equivalent Interest Rate (SEIR). To determine the SEIR, the FNP must be projected into the future for as long as there are anticipated benefits payable under the plan's provision applicable to the membership and beneficiaries of the System on the Measurement Date. If the FNP is projected to not be depleted at any point in the future, the long term expected rate of return on plan investments expected to be used to finance the benefit payments may be used as the SEIR.

If, however, the FNP is projected to be depleted, the SEIR is determined as the single rate that will generate a present value of benefit payments equal to the sum of the present value determined by discounting all projected benefit payments through the date of depletion by the long term expected rate of return, and the present value determined by discounting those benefits after the date of depletion by a 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate. The rate used, if necessary, for this purpose is the monthly average of the Bond Buyers General Obligation 20-year Municipal Bond Index Rate (formerly published monthly by the Board of Governors of the Federal Reserve System).

The sections that follow provide the results of all the necessary calculations, presented in the order laid out in GASB 67 for note disclosure and Required Supplementary Information (RSI).



SECTION II – FINANCIAL STATEMENT NOTES

The material presented herein will follow the order presented in GASB 67. Paragraph numbers are provided for ease of reference.

Paragraphs 30(a) (1)-(3): The information required is to be supplied by the System.

Paragraph 30(a) (4): The data required regarding the membership of the Virginia Retirement System were furnished by the Virginia Retirement System’s office. The following table summarizes the membership of the system as of June 30, 2018, the valuation date.

Membership

GROUP	COUNT					
	State Employees	Teachers	State Police	Judicial	Virginia Law Officers	Political Subdivisions
Active Members	74,582	151,585	1,885	416	8,718	108,691
LTD	2,205	6	16	0	557	25
Total Active Members	76,787	151,591	1,901	416	9,275	108,716
Inactive Members						
Vested	13,108	24,136	160	4	1,103	17,196
Non-Vested	27,280	33,204	209	0	5,125	35,039
Active Elsewhere in VRS	9,009	5,464	245	4	2,948	32,071
Total Inactive Members	49,397	62,804	614	8	9,176	84,306
Retirees						
Service	56,332	87,319	1,139	404	4,667	57,383
Disabled	3,623	4,418	185	0	261	8,257
Beneficiaries	5,141	3,246	225	140	297	4,606
Total Retirees	65,096	94,983	1,549	544	5,225	70,246
Totals	191,280	309,378	4,064	968	23,676	263,268

Paragraphs 30(a) (5)-(6) and Paragraphs 30(b)-(f): The information required is to be supplied by the System.



Paragraphs 31(a) (1)-(4): The information is provided in the following table. As stated above, the NPL is equal to the TPL minus the FNP. That result as of June 30, 2019 is presented in the table below.

Fiscal Year End June 30, 2019
(\$ in Thousands)

	State Employees	Teachers	State Police	Judicial	Virginia Law Officers	Political Subdivisions
Total Pension Liability	\$25,409,842	\$49,683,336	\$1,176,937	\$678,593	\$2,190,025	\$24,206,763
Fiduciary Net Position	<u>19,090,110</u>	<u>36,522,769</u>	<u>865,273</u>	<u>557,541</u>	<u>1,495,990</u>	<u>21,259,032</u>
Net Pension Liability	\$6,319,732	\$13,160,567	\$311,664	\$121,052	\$694,035	\$2,947,731
Ratio of Fiduciary Net Position to Total Pension Liability	75.13%	73.51%	73.52%	82.16%	68.31%	87.82%



Paragraph 31(b) (1)(a)-(f): This paragraph requires information regarding the actuarial assumptions used to measure the TPL. The actuarial assumptions utilized in developing the TPL are outlined in Schedule C. The total pension liability was determined based on an actuarial valuation as of June 30, 2018, using the following actuarial assumptions applied to all periods included in the measurement and rolled forward to the measurement date of June 30, 2019.

Inflation	2.50 percent
Salary increases, including inflation	State Employees - 3.50 percent - 5.35 percent Teachers – 3.50 percent – 5.95 percent State Police – 3.50 percent – 4.75 percent Judicial – 4.50 percent VaLORS – 3.50 percent – 4.75 percent Political Subdivisions – General Employees – 3.50 percent – 5.35 percent Public Safety – 3.50 percent – 4.75 percent
Investment rate of return	6.75 percent, net of investment expenses

The rates of mortality are according to the following mortality tables. The mortality tables are adjusted forward and/or back depending on the plan and the group covered. Refer to Schedule C for the specific adjustments for each plan, other than Political Subdivision plans.

Mortality Table	
For the period before retirement	RP-2014 Employee Rates projected with Scale BB to 2020
For the period after service retirement	RP-2014 Healthy Annuitant Rates projected with Scale BB to 2020
For the period after disability retirement	RP-2014 Disabled Mortality Rates projected with Scale BB to 2020



The actuarial assumptions used to determine the TPL as of June 30, 2018 were based on the results of an actuarial experience study for the period from July 1, 2012 through June 30, 2016 as well as the investment rate of return of 6.75% adopted by the Board of Trustees at its October 10, 2019 meeting.

Paragraph 31(b) (1)

- (a) **Discount rate.** The discount rate used to measure the total pension liability was 6.75 percent, except for two Political Subdivision plans—Town of Stuart (55356) and Upper Valley Regional Park Authority (55490)—with a discount rate of 3.50% equal to the municipal bond index rate.
- (b) **Projected cash flows:** The projection of cash flows used to determine the discount rate assumed that System member contributions will be made per the VRS Statutes and the Employer contributions will be made in accordance with the VRS funding policy at rates equal to the difference between actuarially determined contribution rates adopted by the VRS Board and the member rate. For the state plans, through the fiscal year ending June 30, 2018 the rates contributed by the employer will be subject to the portion of the Board rates as adopted by the Virginia legislature. From July 1, 2018 on, we assume 100% of the actuarially determined contribution rates will be payable for all the VRS plans.
- (c) **Long term rate of return:** Since ASOP 27 allows the actuary to rely on outside experts, it is appropriate to consider the market outlook and expectations provided by the investment staff of the Virginia Retirement System. The following analysis relies on the 10-year forward returns outlook provided by VRS as of July 2019.

Time Span In Years	Mean Return	Standard Deviation	Returns by Percentile				
			5 th	25 th	50 th	75 th	95 th
1	7.63%	10.29%	-8.61%	0.36%	7.11%	14.31%	25.54%
5	7.23%	4.58%	-0.23%	4.04%	7.11%	10.27%	14.99%
10	7.18%	3.23%	1.87%	4.93%	7.11%	9.34%	12.62%
20	7.16%	2.29%	3.37%	5.56%	7.11%	8.68%	10.98%
30	7.15%	1.87%	4.05%	5.84%	7.11%	8.39%	10.26%
50	7.14%	1.45%	4.73%	6.13%	7.11%	8.10%	9.54%



This analysis is based on the target asset allocation as shown below:

Asset Class	Policy Allocation
Public Equity	34.00%
Fixed Income	15.00%
Credit Strategies	14.00%
Real Assets	14.00%
Private Equity	14.00%
MAPS*	6.00%
PIP**	3.00%

* Multi-asset Public Strategies

** Private Investment Partnership

The percentile results are the percentage of compound random returns over the time span shown that are expected to be less than the amount indicated. Thus for the 10-year time span, 5% of the rates of return will be below 1.87% and 95% will be above that. As the time span increases, the results begin to converge. Over a 50 year time span, the results indicate a 25% chance that the returns will be below 6.13% and a 25% chance they will be above 8.10%. There is a 50% chance the returns will be 7.11% or above and a 50% chance the return will be below 7.11%.

- (d) **Municipal bond rate:** The discount rate determination does not use a municipal bond rate, except for the Town of Stuart (55356) and the Upper Valley Regional Park Authority (55490) Political Subdivision plans. To measure the total pension liability for these two plans, the Single Equivalent Interest Rate (SEIR) we have used is the applicable municipal bond index rate of 3.50%, based on the monthly average of the Bond Buyers General Obligation 20-year Municipal Bond Index Rate (formerly published monthly by the Board of Governors of the Federal Reserve System) as of the measurement date of June 30, 2019.
- (e) **Periods of projected benefit payments:** Projected future benefit payments for all current System members were projected through 2126.
- (f) **Assumed asset allocation:** The target asset allocation and best estimates of arithmetic real rates of return for each major asset class as provided by the System for use in the last actuarial experience study for the four-year period ending June 30, 2016 are summarized in the following table:



Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Public Equity	34.00%	5.61%
Fixed Income	15.00%	0.88%
Credit Strategies	14.00%	5.13%
Real Assets	14.00%	5.27%
Private Equity	14.00%	8.77%
MAPS	6.00%	3.52%
PIP	3.00%	6.29%
Total	100.00%	

* Multi-asset Public Strategies
 ** Private Investment Partnership

Paragraph 31(b) (1) (g): This paragraph requires disclosure of the sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the System, calculated using the discount rate of 6.75 percent, as well as what the System’s net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (5.75 percent) or 1-percentage-point higher (7.75 percent) than the current rate (\$ thousands). The sensitivity analysis for two Political Subdivision plans is included at the municipal bond index rate of 3.50% and at 2.50% and 4.50%.

State Employees

	1% Decrease (5.75%)	Discount Rate (6.75%)	1% Increase (7.75%)
Net pension liability	\$ 9,283,632	\$ 6,319,732	\$ 3,828,162

Teachers

	1% Decrease (5.75%)	Discount Rate (6.75%)	1% Increase (7.75%)
Net pension liability	\$ 19,812,371	\$ 13,160,567	\$ 7,660,756



State Police

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net pension liability	\$ 453,612	\$ 311,664	\$ 192,309

Judicial

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net pension liability	\$ 182,616	\$ 121,052	\$ 67,541

Virginia Law Officers

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net pension liability	\$ 974,668	\$ 694,035	\$ 462,184



Political Subdivisions

	1% Decrease	Current Discount Rate	1% Increase
Net pension liability	\$ 6,063,120	\$ 2,947,731	\$ 462,729

Paragraph 31(c): The TPL is calculated as of June 30, 2018 and was rolled forward using standard actuarial techniques to the Measurement Date of June 30, 2019.



SECTION III – REQUIRED SUPPLEMENTARY INFORMATION

There are several tables of Required Supplementary Information (RSI) that need to be included in the System's financial statements:

Paragraphs 32(a)-(c): The required tables are provided in Schedule A.

Paragraph 32(d): The money-weighted rates of return required are to be supplied by the System.

Paragraph 34: In addition the following should be noted regarding the RSI:

Changes of benefit terms. There have been no significant changes to the System benefit provisions since the prior actuarial valuation. A hybrid plan with changes to the defined benefit plan structure and a new defined contribution component was adopted in 2012. The hybrid plan applies to most new employees hired on or after January 1, 2014 and not covered by enhanced hazardous duty benefits. Some of the Political Subdivision plans have made changes to the benefits provided to members in hazardous duty positions. In aggregate the impact of these changes on the Political Subdivision plans is not significant.

Changes of assumptions. The VRS Board of Trustees adopted a 6.75% investment rate of return since the prior measurement date. Assumptions adopted based on the experience study for the period June 30, 2012 to June 30, 2016 were reflected for the June 30, 2017 measurement date.

Method and assumptions used in calculations of actuarially determined contributions. The actuarially determined contribution rates are determined every two years. The last determination of the actuarial contribution rates was as of June 30, 2017 payable for the fiscal years 2019 and 2020. For the non-Political Subdivision plans the amortization period of the unfunded liability 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 liability and will be amortized over a closed 20 year period. The deferred contribution, as defined under the 2011 Appropriations Act, Item 469(1)(6), has been paid off except for Teachers which is to be amortized using a level-dollar, closed 10 year period beginning June 30, 2011. For the Political Subdivision plans the amortization period of the unfunded 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 liability and will be amortized over a closed 20 year period. The following actuarial methods and assumptions were used to determine contribution rates as of the June 30, 2017 actuarial valuations of the VRS pension plans:



Actuarial cost method	Entry age
Amortization method	Level percentage of payroll, closed
Remaining amortization period	26 years, 20 years, 19 years, 18 years, 17 years and 4 years
Asset valuation method	5-year smoothed market
Inflation	2.50 percent
Payroll growth	3.00 percent
Salary increases, including inflation	State Employees - 3.50 percent - 5.35 percent Teachers – 3.50 percent – 5.95 percent State Police – 3.50 percent – 4.75 percent Judicial – 4.50 percent VaLORS – 3.50 percent – 4.75 percent Political Subdivisions – General Employees – 3.50 percent – 5.35 percent Public Safety – 3.50 percent – 4.75 percent
Investment rate of return	7.00 percent, net of investment expenses

SCHEDULE A

REQUIRED SUPPLEMENTARY INFORMATION

**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)
(\$ in Thousands)**



State Employees Plan

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability										
Service Cost	\$379,359	\$375,965	\$370,235	\$369,779	\$375,149	\$369,120				
Interest	1,627,637	1,606,772	1,562,819	1,533,764	1,482,951	1,436,064				
Benefit changes	0	0	0	0	0	0				
Difference between expected and actual experience	181,189	(327,289)	(85,975)	(245,642)	59,923	0				
Changes of assumptions	663,566	0	76,965	0	0	0				
Benefit payments	(1,360,833)	(1,296,803)	(1,234,388)	(1,195,198)	(1,136,102)	(1,081,866)				
Refunds of contributions	<u>(26,897)</u>	<u>(30,236)</u>	<u>(30,837)</u>	<u>(25,240)</u>	<u>(27,724)</u>	<u>(25,036)</u>				
Net change in total pension liability	1,464,021	328,409	658,819	437,463	754,197	698,282				
Total pension liability - beginning	<u>\$23,945,821</u>	<u>\$23,617,412</u>	<u>\$22,958,593</u>	<u>\$22,521,130</u>	<u>\$21,766,933</u>	<u>\$21,068,651</u>				
Total pension liability - ending (a)	<u>\$25,409,842</u>	<u>\$23,945,821</u>	<u>\$23,617,412</u>	<u>\$22,958,593</u>	<u>\$22,521,130</u>	<u>\$21,766,933</u>				
Plan net position										
Contributions - employer	\$545,584	\$548,158	\$535,424	\$722,617	\$480,657	\$343,259				
Contributions - member	201,481	201,920	201,391	200,184	195,582	198,035				
Net investment income	1,211,722	1,302,241	1,963,811	277,166	728,083	2,243,999				
Benefit payments	(1,360,833)	(1,296,803)	(1,234,388)	(1,195,198)	(1,136,102)	(1,081,866)				
Administrative expense	(12,374)	(11,481)	(11,612)	(10,140)	(10,302)	(12,341)				
Refunds of contributions	(26,897)	(30,236)	(30,837)	(25,240)	(27,724)	(25,036)				
Other	<u>(762)</u>	<u>28,502</u>	<u>(1,743)</u>	<u>(122)</u>	<u>(154)</u>	<u>123</u>				
Net change in plan net position	557,921	742,301	1,422,046	(30,733)	230,040	1,666,173				
Plan net position - beginning	<u>\$18,532,189</u>	<u>\$17,789,888</u>	<u>\$16,367,842</u>	<u>\$16,398,575</u>	<u>\$16,168,535</u>	<u>\$14,502,362</u>				
Plan net position - ending (b)	<u>\$19,090,110</u>	<u>\$18,532,189</u>	<u>\$17,789,888</u>	<u>\$16,367,842</u>	<u>\$16,398,575</u>	<u>\$16,168,535</u>				
Net pension liability - ending (a) - (b)	\$6,319,732	\$5,413,632	\$5,827,524	\$6,590,751	\$6,122,555	\$5,598,398				

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)
(\$ in Thousands)



Teacher Plan

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability										
Service Cost	\$889,003	\$885,510	\$830,475	\$828,856	\$828,901	\$831,501				
Interest	3,184,697	3,099,338	3,016,207	2,931,065	2,834,138	2,722,787				
Benefit changes	0	0	0	0	0	0				
Difference between expected and actual experience	(174,815)	(440,308)	(642,745)	(391,881)	(212,089)	0				
Changes of assumptions	1,472,649	0	218,559	0	0	0				
Benefit payments	(2,331,038)	(2,241,927)	(2,147,781)	(2,081,069)	(1,980,353)	(1,874,636)				
Refunds of contributions	<u>(36,715)</u>	<u>(40,578)</u>	<u>(39,521)</u>	<u>(35,067)</u>	<u>(36,058)</u>	<u>(36,103)</u>				
Net change in total pension liability	3,003,781	1,262,035	1,235,194	1,251,904	1,434,539	1,643,549				
Total pension liability - beginning	<u>\$46,679,555</u>	<u>\$45,417,520</u>	<u>\$44,182,326</u>	<u>\$42,930,422</u>	<u>\$41,495,883</u>	<u>\$39,852,334</u>				
Total pension liability - ending (a)	<u>\$49,683,336</u>	<u>\$46,679,555</u>	<u>\$45,417,520</u>	<u>\$44,182,326</u>	<u>\$42,930,422</u>	<u>\$41,495,883</u>				
Plan net position										
Contributions - employer	\$1,280,964	\$1,292,988	\$1,137,976	\$1,062,338	\$1,267,250	\$853,634				
Contributions - member	403,258	391,490	392,730	380,314	373,525	371,241				
Net investment income	2,311,028	2,421,157	3,632,291	516,704	1,327,047	4,042,441				
Benefit payments	(2,331,038)	(2,241,927)	(2,147,781)	(2,081,069)	(1,980,353)	(1,874,636)				
Administrative expense	(22,843)	(20,945)	(21,123)	(18,859)	(18,238)	(22,036)				
Refunds of contributions	(36,715)	(40,578)	(39,521)	(35,067)	(36,058)	(36,103)				
Other	<u>(1,448)</u>	<u>(2,167)</u>	<u>(3,238)</u>	<u>(222)</u>	<u>(284)</u>	<u>217</u>				
Net change in plan net position	1,603,206	1,800,018	2,951,334	(175,861)	932,889	3,334,758				
Plan net position - beginning	<u>\$34,919,563</u>	<u>\$33,119,545</u>	<u>\$30,168,211</u>	<u>\$30,344,072</u>	<u>\$29,411,183</u>	<u>\$26,076,425</u>				
Plan net position - ending (b)	<u>\$36,522,769</u>	<u>\$34,919,563</u>	<u>\$33,119,545</u>	<u>\$30,168,211</u>	<u>\$30,344,072</u>	<u>\$29,411,183</u>				
Net pension liability - ending (a) - (b)	\$13,160,567	\$11,759,992	\$12,297,975	\$14,014,115	\$12,586,350	\$12,084,700				

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)
(\$ in Thousands)



SPORS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability										
Service Cost	\$20,079	\$18,187	\$18,880	\$18,700	\$18,847	\$18,341				
Interest	72,715	71,251	74,042	72,618	70,350	67,977				
Benefit changes	0	0	0	0	0	0				
Difference between expected and actual experience	45,330	(7,248)	(5,327)	(14,711)	(2,890)	0				
Changes of assumptions	31,773	0	(68,707)	0	0	0				
Benefit payments	(62,683)	(58,197)	(57,814)	(53,515)	(53,338)	(50,467)				
Refunds of contributions	<u>(805)</u>	<u>(867)</u>	<u>(630)</u>	<u>(584)</u>	<u>(375)</u>	<u>(685)</u>				
Net change in total pension liability	106,409	23,126	(39,556)	22,508	32,594	35,166				
Total pension liability - beginning	<u>\$1,070,528</u>	<u>\$1,047,402</u>	<u>\$1,086,958</u>	<u>\$1,064,450</u>	<u>\$1,031,856</u>	<u>\$996,690</u>				
Total pension liability - ending (a)	<u>\$1,176,937</u>	<u>\$1,070,528</u>	<u>\$1,047,402</u>	<u>\$1,086,958</u>	<u>\$1,064,450</u>	<u>\$1,031,856</u>				
Plan net position										
Contributions - employer	\$31,437	\$35,806	\$31,888	\$33,655	\$28,427	\$42,683				
Contributions - member	6,379	6,311	5,701	5,759	5,680	5,646				
Net investment income	54,792	58,148	87,265	12,634	32,466	98,682				
Benefit payments	(62,683)	(58,197)	(57,814)	(53,515)	(53,338)	(50,467)				
Administrative expense	(488)	(509)	(926)	(590)	(471)	(431)				
Refunds of contributions	(805)	(867)	(630)	(584)	(375)	(685)				
Other	<u>(61)</u>	<u>(63)</u>	<u>(99)</u>	<u>(23)</u>	<u>(27)</u>	<u>0</u>				
Net change in plan net position	28,571	40,629	65,385	(2,664)	12,362	95,428				
Plan net position - beginning	<u>\$836,702</u>	<u>\$796,073</u>	<u>\$730,688</u>	<u>\$733,352</u>	<u>\$720,990</u>	<u>\$625,562</u>				
Plan net position - ending (b)	<u>\$865,273</u>	<u>\$836,702</u>	<u>\$796,073</u>	<u>\$730,688</u>	<u>\$733,352</u>	<u>\$720,990</u>				
Net pension liability - ending (a) - (b)	\$311,664	\$233,826	\$251,329	\$356,270	\$331,098	\$310,886				

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)
(\$ in Thousands)



JRS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability										
Service Cost	\$18,767	\$19,228	\$22,144	\$21,978	\$23,254	\$24,024				
Interest	44,139	43,799	42,081	42,820	41,759	40,014				
Benefit changes	0	0	0	(15,552)	0	0				
Difference between expected and actual experience	(7,157)	(15,786)	(14,774)	(18,681)	(9,107)	0				
Changes of assumptions	14,077	0	16,114	0	0	0				
Benefit payments	(43,584)	(41,165)	(40,895)	(41,341)	(40,205)	(37,984)				
Refunds of contributions	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>				
Net change in total pension liability	26,242	6,076	24,670	(10,776)	15,701	26,054				
Total pension liability - beginning	<u>\$652,351</u>	<u>\$646,275</u>	<u>\$621,605</u>	<u>\$632,381</u>	<u>\$616,680</u>	<u>\$590,626</u>				
Total pension liability - ending (a)	<u>\$678,593</u>	<u>\$652,351</u>	<u>\$646,275</u>	<u>\$621,605</u>	<u>\$632,381</u>	<u>\$616,680</u>				
Plan net position										
Contributions - employer	\$22,890	\$28,096	\$27,612	\$41,502	\$31,503	\$27,727				
Contributions - member	3,208	3,231	3,272	3,236	3,015	3,051				
Net investment income	35,372	37,466	56,029	8,112	20,051	60,833				
Benefit payments	(43,584)	(41,165)	(40,895)	(41,341)	(40,205)	(37,984)				
Administrative expense	(315)	(326)	(594)	(363)	(283)	(268)				
Refunds of contributions	0	0	0	0	0	0				
Other	<u>(39)</u>	<u>(42)</u>	<u>(64)</u>	<u>(15)</u>	<u>(17)</u>	<u>0</u>				
Net change in plan net position	17,532	27,260	45,360	11,131	14,064	53,359				
Plan net position - beginning	<u>\$540,009</u>	<u>\$512,749</u>	<u>\$467,389</u>	<u>\$456,258</u>	<u>\$442,194</u>	<u>\$388,835</u>				
Plan net position - ending (b)	<u>\$557,541</u>	<u>\$540,009</u>	<u>\$512,749</u>	<u>\$467,389</u>	<u>\$456,258</u>	<u>\$442,194</u>				
Net pension liability - ending (a) - (b)	\$121,052	\$112,342	\$133,526	\$154,216	\$176,123	\$174,486				

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)
(\$ in Thousands)



VaLORS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability										
Service Cost	\$44,526	\$45,179	\$47,189	\$45,608	\$47,531	\$46,504				
Interest	139,307	136,289	135,453	129,756	124,579	119,040				
Benefit changes	0	0	0	0	0	0				
Difference between expected and actual experience	11,067	(26,111)	(1,457)	4,997	(4,849)	0				
Changes of assumptions	62,090	0	(63,457)	0	0	0				
Benefit payments	(109,193)	(104,776)	(96,224)	(92,270)	(84,990)	(78,412)				
Refunds of contributions	<u>(4,933)</u>	<u>(5,604)</u>	<u>(4,938)</u>	<u>(4,524)</u>	<u>(4,797)</u>	<u>(4,665)</u>				
Net change in total pension liability	142,864	44,977	16,566	83,567	77,474	82,467				
Total pension liability - beginning	<u>\$2,047,161</u>	<u>\$2,002,184</u>	<u>\$1,985,618</u>	<u>\$1,902,051</u>	<u>\$1,824,577</u>	<u>\$1,742,110</u>				
Total pension liability - ending (a)	<u>\$2,190,025</u>	<u>\$2,047,161</u>	<u>\$2,002,184</u>	<u>\$1,985,618</u>	<u>\$1,902,051</u>	<u>\$1,824,577</u>				
Plan net position										
Contributions - employer	\$75,327	\$73,793	\$73,816	\$79,392	\$62,084	\$67,483				
Contributions - member	17,871	17,496	17,598	17,574	17,081	17,908				
Net investment income	93,872	98,292	146,039	20,899	52,312	156,786				
Benefit payments	(109,193)	(104,776)	(96,224)	(92,270)	(84,990)	(78,412)				
Administrative expense	(831)	(861)	(1,540)	(940)	(743)	(681)				
Refunds of contributions	(4,933)	(5,604)	(4,938)	(4,524)	(4,797)	(4,665)				
Other	<u>(103)</u>	<u>(247)</u>	<u>(310)</u>	<u>(38)</u>	<u>(44)</u>	<u>0</u>				
Net change in plan net position	72,010	78,093	134,441	20,093	40,903	158,419				
Plan net position - beginning	<u>\$1,423,980</u>	<u>\$1,345,887</u>	<u>\$1,211,446</u>	<u>\$1,191,353</u>	<u>\$1,150,450</u>	<u>\$992,031</u>				
Plan net position - ending (b)	<u>\$1,495,990</u>	<u>\$1,423,980</u>	<u>\$1,345,887</u>	<u>\$1,211,446</u>	<u>\$1,191,353</u>	<u>\$1,150,450</u>				
Net pension liability - ending (a) - (b)	\$694,035	\$623,181	\$656,297	\$774,172	\$710,698	\$674,127				



SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)
(\$ in Thousands)

Political Subdivision Plans

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability										
Service Cost	\$556,149	\$544,762	\$541,594	\$535,322	\$530,945	\$524,758				
Interest	1,535,532	1,472,680	1,422,753	1,362,892	1,309,484	1,243,386				
Benefit changes	3,948	10,811	36,652	2,053	1,135	0				
Difference between expected and actual experience	45,032	(43,177)	(205,649)	(87,268)	(185,419)	0				
Changes of assumptions	691,407	0	(64,510)	0	0	0				
Benefit payments	(1,082,791)	(1,010,021)	(941,856)	(893,585)	(819,201)	(754,706)				
Refunds of contributions	<u>(40,249)</u>	<u>(41,324)</u>	<u>(42,068)</u>	<u>(37,380)</u>	<u>(36,898)</u>	<u>(36,876)</u>				
Net change in total pension liability	1,709,028	933,731	746,916	882,034	800,046	976,562				
Total pension liability - beginning	<u>\$22,497,735</u>	<u>\$21,564,004</u>	<u>\$20,817,088</u>	<u>\$19,935,054</u>	<u>\$19,135,008</u>	<u>\$18,158,446</u>				
Total pension liability - ending (a)	<u>\$24,206,763</u>	<u>\$22,497,735</u>	<u>\$21,564,004</u>	<u>\$20,817,088</u>	<u>\$19,935,054</u>	<u>\$19,135,008</u>				
Plan net position										
Contributions - employer	\$499,293	\$490,286	\$477,563	\$543,947	\$533,877	\$539,366				
Contributions - member	248,421	241,339	238,636	231,934	227,060	225,555				
Net investment income	1,345,759	1,415,454	2,113,973	300,995	761,164	2,272,284				
Benefit payments	(1,082,791)	(1,010,021)	(941,856)	(893,585)	(819,201)	(754,706)				
Administrative expense	(13,369)	(12,236)	(12,220)	(10,696)	(10,358)	(12,153)				
Refunds of contributions	(40,249)	(41,324)	(42,068)	(37,380)	(36,898)	(36,876)				
Other	<u>(853)</u>	<u>(30,924)</u>	<u>(1,887)</u>	<u>(130)</u>	<u>(162)</u>	<u>120</u>				
Net change in plan net position	956,211	1,052,574	1,832,141	135,085	655,482	2,233,590				
Plan net position - beginning	<u>\$20,302,821</u>	<u>\$19,250,247</u>	<u>\$17,418,106</u>	<u>\$17,283,021</u>	<u>\$16,627,539</u>	<u>\$14,393,949</u>				
Plan net position - ending (b)	<u>\$21,259,032</u>	<u>\$20,302,821</u>	<u>\$19,250,247</u>	<u>\$17,418,106</u>	<u>\$17,283,021</u>	<u>\$16,627,539</u>				
Net pension liability - ending (a) - (b)	\$2,947,731	\$2,194,914	\$2,313,757	\$3,398,982	\$2,652,033	\$2,507,469				

SCHEDULE OF THE NET PENSION LIABILITY
GASB 67 Paragraph 32(b)
(\$ in Thousands)



State Employees Plan

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability	\$25,409,842	\$23,945,821	\$23,617,412	\$22,958,593	\$22,521,130	\$21,766,933				
Plan net position	<u>19,090,110</u>	<u>18,532,189</u>	<u>17,789,888</u>	<u>16,367,842</u>	<u>16,398,575</u>	<u>16,168,535</u>				
Net pension liability	\$6,319,732	\$5,413,632	\$5,827,524	\$6,590,751	\$6,122,555	\$5,598,398				
Ratio of plan net position to total pension liability	75.13%	77.39%	75.33%	71.29%	72.81%	74.28%				
Covered employee payroll	\$4,197,484	\$4,152,368	\$4,020,893	\$3,977,759	\$3,878,632	\$3,861,712				
Net pension liability as a percentage of covered-employee payroll	150.56%	130.37%	144.93%	165.69%	157.85%	144.97%				

Teacher Plan

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability	\$49,683,336	\$46,679,555	\$45,417,520	\$44,182,326	\$42,930,422	\$41,495,883				
Plan net position	<u>36,522,769</u>	<u>34,919,563</u>	<u>33,119,545</u>	<u>30,168,211</u>	<u>30,344,072</u>	<u>29,411,183</u>				
Net pension liability	\$13,160,567	\$11,759,992	\$12,297,975	\$14,014,115	\$12,586,350	\$12,084,700				
Ratio of plan net position to total pension liability	73.51%	74.81%	72.92%	68.28%	70.68%	70.88%				
Covered employee payroll	\$8,387,503	\$8,086,986	\$7,891,783	\$7,624,612	\$7,434,932	\$7,313,025				
Net pension liability as a percentage of covered-employee payroll	156.91%	145.42%	155.83%	183.80%	169.29%	165.25%				

SCHEDULE OF THE NET PENSION LIABILITY
GASB 67 Paragraph 32(b)
(\$ in Thousands)



SPORS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability	\$1,176,937	\$1,070,528	\$1,047,402	\$1,086,958	\$1,064,450	\$1,031,856				
Plan net position	<u>865,273</u>	<u>836,702</u>	<u>796,073</u>	<u>730,688</u>	<u>733,352</u>	<u>720,990</u>				
Net pension liability	\$311,664	\$233,826	\$251,329	\$356,270	\$331,098	\$310,866				
Ratio of plan net position to total pension liability	73.52%	78.16%	76.00%	67.22%	68.89%	69.87%				
Covered employee payroll	\$126,483	\$124,003	\$111,395	\$114,395	\$110,059	\$112,010				
Net pension liability as a percentage of covered-employee payroll	246.41%	188.56%	225.62%	311.44%	300.84%	277.53%				

JRS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability	\$678,593	\$652,351	\$646,275	\$621,605	\$632,381	\$616,680				
Plan net position	<u>557,541</u>	<u>540,009</u>	<u>512,749</u>	<u>467,389</u>	<u>456,258</u>	<u>442,194</u>				
Net pension liability	\$121,052	\$112,342	\$133,526	\$154,216	\$176,123	\$174,486				
Ratio of plan net position to total pension liability	82.16%	82.78%	79.34%	75.19%	72.15%	71.71%				
Covered employee payroll	\$68,330	\$68,245	\$66,826	\$66,621	\$61,092	\$61,020				
Net pension liability as a percentage of covered-employee payroll	177.16%	164.62%	199.81%	231.48%	288.29%	285.95%				

SCHEDULE OF THE NET PENSION LIABILITY
GASB 67 Paragraph 32(b)
(\$ in Thousands)



VaLORS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability	\$2,190,025	\$2,047,161	\$2,002,184	\$1,985,618	\$1,902,051	\$1,824,577				
Plan net position	<u>1,495,990</u>	<u>1,423,980</u>	<u>1,345,887</u>	<u>1,211,446</u>	<u>1,191,353</u>	<u>1,150,450</u>				
Net pension liability	\$694,035	\$623,181	\$656,297	\$774,172	\$710,698	\$674,127				
Ratio of plan net position to total pension liability	68.31%	69.56%	67.22%	61.01%	62.64%	63.05%				
Covered employee payroll	\$349,998	\$345,531	\$344,468	\$345,504	\$338,562	\$352,492				
Net pension liability as a percentage of covered-employee payroll	198.30%	180.35%	190.52%	224.07%	209.92%	191.25%				

Political Subdivision Plans

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability	\$24,206,763	\$22,497,735	\$21,564,004	\$20,817,088	\$19,935,054	\$19,135,008				
Plan net position	<u>21,259,032</u>	<u>20,302,821</u>	<u>19,250,247</u>	<u>17,418,106</u>	<u>17,283,021</u>	<u>16,627,539</u>				
Net pension liability	\$2,947,731	\$2,194,914	\$2,313,757	\$3,398,982	\$2,652,033	\$2,507,469				
Ratio of plan net position to total pension liability	87.82%	90.24%	89.27%	83.67%	86.70%	86.90%				
Covered employee payroll	\$5,118,622	\$4,932,344	\$4,765,842	\$4,628,806	\$4,513,335	\$4,434,764				
Net pension liability as a percentage of covered-employee payroll	57.59%	44.50%	48.55%	73.43%	58.76%	56.54%				

SCHEDULE OF EMPLOYER CONTRIBUTIONS
GASB 67 Paragraph 32(c)
(\$ in Thousands)



State Employees Plan

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$567,500	\$560,154	\$542,418	\$628,486	\$612,824	\$504,726	\$485,577	\$309,930	\$294,363	\$285,209
Actual employer contributions	<u>567,500</u>	<u>560,154</u>	<u>542,418</u>	<u>557,160</u>	<u>478,235</u>	<u>338,286</u>	<u>325,452</u>	<u>117,696</u>	<u>74,113</u>	<u>176,751</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$71,326</u>	<u>\$134,589</u>	<u>\$166,440</u>	<u>\$160,125</u>	<u>\$192,234</u>	<u>\$220,250</u>	<u>\$108,458</u>
Covered employee payroll	\$4,197,484	\$4,152,368	\$4,020,893	\$3,977,759	\$3,878,632	\$3,861,712	\$3,715,205	\$3,663,475	\$3,479,484	\$3,556,222
Actual contributions as a percentage of covered employee payroll	13.52%	13.49%	13.49%	14.01%	12.33%	8.76%	8.76%	3.21%	2.13%	4.97%

Teacher Plan

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$1,315,160	\$1,319,796	\$1,287,939	\$1,344,981	\$1,353,158	\$1,226,394	\$1,203,856	\$903,655	\$891,237	\$839,550
Actual employer contributions	<u>1,315,160</u>	<u>1,319,796</u>	<u>1,156,935</u>	<u>1,072,020</u>	<u>1,078,065</u>	<u>852,699</u>	<u>837,028</u>	<u>443,078</u>	<u>271,306</u>	<u>450,218</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$131,004</u>	<u>\$272,961</u>	<u>\$275,093</u>	<u>\$373,695</u>	<u>\$366,828</u>	<u>\$460,577</u>	<u>\$619,931</u>	<u>\$389,332</u>
Covered employee payroll	\$8,387,503	\$8,086,986	\$7,891,783	\$7,624,612	\$7,434,932	\$7,313,025	\$7,178,629	\$6,999,653	\$6,903,465	\$7,090,791
Actual contributions as a percentage of covered employee payroll	15.68%	16.32%	14.66%	14.06%	14.50%	11.66%	11.66%	6.33%	3.93%	6.35%

SCHEDULE OF EMPLOYER CONTRIBUTIONS
GASB 67 Paragraph 32(c)
(\$ in Thousands)



SPORS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$31,469	\$35,391	\$31,792	\$35,211	\$33,876	\$36,538	\$34,535	\$26,250	\$24,570	\$23,791
Actual employer contributions	<u>31,469</u>	<u>35,391</u>	<u>31,792</u>	<u>31,561</u>	<u>28,417</u>	<u>27,711</u>	<u>26,193</u>	<u>11,441</u>	<u>7,460</u>	<u>15,714</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$3,650</u>	<u>\$5,459</u>	<u>\$8,827</u>	<u>\$8,342</u>	<u>\$14,809</u>	<u>\$17,110</u>	<u>\$8,077</u>
Covered employee payroll	\$126,483	\$124,003	\$111,395	\$114,395	\$110,059	\$112,010	\$105,872	\$102,701	\$96,128	\$98,757
Actual contributions as a percentage of covered employee payroll	24.88%	28.54%	28.54%	27.59%	25.82%	24.74%	24.74%	11.14%	7.76%	15.91%

JRS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$23,499	\$28,642	\$28,047	\$37,008	\$35,336	\$33,018	\$32,185	\$27,631	\$28,101	\$23,638
Actual employer contributions	<u>23,499</u>	<u>28,642</u>	<u>28,047</u>	<u>33,291</u>	<u>31,560</u>	<u>27,728</u>	<u>27,028</u>	<u>18,907</u>	<u>17,303</u>	<u>17,065</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$3,717</u>	<u>\$3,776</u>	<u>\$5,290</u>	<u>\$5,157</u>	<u>\$8,724</u>	<u>\$10,798</u>	<u>\$6,573</u>
Covered employee payroll	\$68,330	\$68,245	\$66,826	\$66,621	\$61,092	\$61,020	\$59,481	\$59,053	\$60,058	\$62,139
Actual contributions as a percentage of covered employee payroll	34.39%	41.97%	41.97%	49.97%	51.66%	45.44%	45.44%	32.02%	28.81%	27.46%

SCHEDULE OF EMPLOYER CONTRIBUTIONS
GASB 67 Paragraph 32(c)
(\$ in Thousands)



VaLORS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$75,635	\$72,734	\$72,511	\$72,763	\$71,301	\$68,806	\$66,463	\$55,306	\$53,686	\$57,894
Actual employer contributions	<u>75,635</u>	<u>72,734</u>	<u>72,511</u>	<u>65,101</u>	<u>59,824</u>	<u>52,169</u>	<u>50,392</u>	<u>24,481</u>	<u>17,255</u>	<u>39,027</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$7,662</u>	<u>\$11,477</u>	<u>\$16,637</u>	<u>\$16,071</u>	<u>\$30,825</u>	<u>\$36,431</u>	<u>\$18,867</u>
Covered employee payroll	\$349,998	\$345,531	\$344,468	\$345,504	\$338,562	\$352,492	\$340,489	\$347,181	\$337,010	\$345,020
Actual contributions as a percentage of covered employee payroll	21.61%	21.05%	21.05%	18.84%	17.67%	14.80%	14.80%	7.05%	5.12%	11.31%

Political Subdivision Plans

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$515,904	\$504,955	\$487,066	\$554,335	\$540,859	\$551,822	\$537,657	\$400,879	\$391,531	\$363,982
Actual employer contributions	<u>518,513</u>	<u>505,603</u>	<u>487,702</u>	<u>549,408</u>	<u>535,919</u>	<u>539,131</u>	<u>525,385</u>	<u>400,879</u>	<u>391,531</u>	<u>363,982</u>
Annual contribution deficiency (excess)	<u>(\$2,609)</u>	<u>(\$648)</u>	<u>(\$636)</u>	<u>\$4,927</u>	<u>\$4,940</u>	<u>\$12,691</u>	<u>\$12,272</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
Covered employee payroll	\$5,118,622	\$4,932,344	\$4,765,842	\$4,628,806	\$4,513,335	\$4,434,764	\$4,321,565	\$4,142,150	\$4,078,580	\$4,125,087
Actual contributions as a percentage of covered employee payroll	10.13%	10.25%	10.23%	11.87%	11.87%	12.16%	12.16%	9.68%	9.60%	8.82%



Schedule B – Summary of Main Benefit Provisions

SCHEDULE B

SUMMARY OF MAIN BENEFIT AND CONTRIBUTION PROVISIONS

This schedule summarizes the major retirement benefit provisions of VRS included in the valuations. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Benefit Provisions which apply to all VRS Plans

Plan Year:	Twelve-month period ending June 30th.
Administration:	All plans are administered by the Board of Trustees of the Virginia Retirement System.
Plan 1:	Members hired prior to July 1, 2010 and who were vested as of January 1, 2013.
Plan 2:	Members hired on or after July 1, 2010, or members hired prior to July 1, 2010 and who were not vested as of January 1, 2013. Members hired after January 1, 2014 in the State Police and Virginia Law Officers Plans are in Plan 2.
Hybrid:	Members hired on or after January 1, 2014 or by member election. There is no Hybrid Plan in the State Police and Virginia Law Officers Plans.
Eligibility:	All full-time, salaried, permanent employees of the Commonwealth of Virginia or of any participating Virginia city, county, town or political subdivision or of any local Virginia school boards are eligible to become members of VRS. This summary covers the provisions relating to state employees.
Employee Contributions:	
Defined Benefit -	Active members in Plan 1 and Plan 2 contribute 5.00% of their creditable compensation per year. Active members in the Hybrid Plan contribute 4.00% 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).



Schedule B – Summary of Main Benefit Provisions

Defined Contribution - Active members in the Hybrid Plan are required to contribute 1.00% 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 4.00% of their creditable compensation.

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

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

100% Survivor Option:

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

50% Survivor Option:

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

Leveling Option:

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

Partial Lump Sum Option:

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

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



Schedule B – State Employees’ Plan Provisions

STATE EMPLOYEES
Plan Specific Benefit Provisions

Effective Date:	March 1, 1952
Type of Plan:	VRS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered an agent multiple-employer PERS with separate cost-sharing pools for state employees and teachers.
Service:	Employees receive credit of one month of service for each month a contribution is made on their behalf to VRS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.
Average Final Compensation:	
Plan 1:	The average of the member’s highest 36 consecutive months of salary.
Plan 2 and Hybrid:	The average of the member’s highest 60 consecutive months of salary.
Normal Retirement:	
Plan 1:	Eligibility: A member may retire upon Normal Retirement on or after age 65 with credit for 5 years of service. Annual Benefit: 1.70% of average final compensation (AFC) times years of service. Payment Form: Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the



Schedule B – State Employees’ Plan Provisions

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.

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 B – 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 and Hybrid:

Eligibility:

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

Annual Benefit:

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



Schedule B – State Employees' Plan Provisions

Payment Form:

Same as for Normal Retirement above.

**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.



Schedule B – State Employees' 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 65 from this plan. The deferred benefit will be computed like a normal retirement benefit. For this calculation, a member's creditable service will include the period of disability, and the Average Final Compensation will be adjusted to reflect increases in the cost-of-living between the date of disability and age 65. If the member dies while disabled before age 65, a death benefit will be determined as though the employee were an active member.

Deferred Termination Benefit:

Plan 1:

Eligibility:

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

Annual Benefit:

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



Schedule B – State Employees’ Plan Provisions

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

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

Plan 2 and Hybrid:

Eligibility:

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

Annual Benefit:

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

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

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

Withdrawal (Refund) Benefit:

Eligibility:

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



Schedule B – State Employees’ Plan Provisions

Benefit:

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

Death Benefit:

Eligibility:

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

Benefit:

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

Work-Related Death:

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

Cost-of-Living Increase:

Plan 1:

Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the



Schedule B – State Employees’ Plan Provisions

Consumer Price Index increase plus half of each percentage increase from 3% to 7%.

Plan 2 and Hybrid:

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

Plans 1,2 & Hybrid:

The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within 5 years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.



Schedule B – Teachers’ Plan Provisions

TEACHERS
Plan Specific Benefit Provisions

Effective Date: March 1, 1952

Type of Plan: VRS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered an agent multiple-employer PERS with separate cost-sharing pools for state employees and teachers.

Service: Employees receive credit of one month of service for each month a contribution is made on their behalf to VRS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.

Average Final Compensation:

Plan 1: The average of the member’s highest 36 consecutive months of salary.

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

Normal Retirement:

Plan 1: Eligibility:

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

Annual Benefit:

1.70% of average final compensation (AFC) times years of service.

Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the



Schedule B – Teachers’ Plan Provisions

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.

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.



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Early Retirement:

Plan 1:

Eligibility:

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

Annual Benefit:

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

Payment Form:

Same as for Normal Retirement above.

Plan 2 and Hybrid:

Eligibility:

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

Annual Benefit:

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



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Payment Form:

Same as for Normal Retirement above.

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

Eligibility:

A member is eligible from the first day of employment.

Annual Benefit:

For members with less than five years of service credit, the minimum guaranteed benefit. For members with greater than five years of service credit, the greater of the minimum guaranteed benefit and 1.7% of AFC times service credit. Benefit is reduced by Worker's Compensation (if any).

Minimum Guaranteed Benefit:

- Workers Compensation Guarantee:

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

- Special Retirement Allowance Guarantee:

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

Service Credit:

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



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Payment Form:

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

Disability Retirement – VLDP (Hybrid Plan):

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



Schedule B – Teachers’ Plan Provisions

Deferred Termination Benefit:

Plan 1:

Eligibility:

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

Annual Benefit:

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

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

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

Plan 2 and Hybrid:

Eligibility:

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

Annual Benefit:

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



Schedule B – Teachers’ Plan Provisions

Payment Form:

Same as for Normal Retirement above.

Death Benefit:

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

Withdrawal (Refund) Benefit:

Eligibility:

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

Benefit:

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

Death Benefit:

Eligibility:

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

Benefit:

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



Schedule B – Teachers’ Plan Provisions

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

Work-Related Death:

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

Cost-of-Living Increase:

- Plan 1:** Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.
- Plan 2 and Hybrid:** Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%.
- Plans 1, 2 & Hybrid:** The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within 5 years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.



Schedule B – State Police Plan Provisions

STATE POLICE
Plan Specific Benefit Provisions

Effective Date: July 1, 1950

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

Service: Employees receive credit of one month of service for each month a contribution is made on their behalf to SPORS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.

Average Final Compensation:

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

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

Normal Retirement: Eligibility:

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

Annual Benefit:

1.85% of average final compensation (AFC) times years of service for retirements on or after July 1, 2007 (1.70% of AFC times years of service for retirements prior to July 1, 2007).

Payment Form:

Benefits are paid as a monthly life annuity, with a guarantee that if the payments do not exceed the member's contributions plus interest, determined as of the date at retirement, the balance will be paid in



Schedule B – State Police Plan Provisions

a lump sum to the member's beneficiary. Optional forms of payment are available.

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



Schedule B – State Police Plan Provisions

adjusted biennially based upon increases in Social Security benefits during the interim period.

**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 B – 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.



Schedule B – State Police 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, 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



Schedule B – State Police Plan Provisions

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

Work-Related Death:

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

Cost-of-Living Increase:

- Plan 1:** Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.
- Plan 2:** Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer 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 B – Judicial Plan Provisions

JUDICIAL
Plan Specific Benefit Provisions

Effective Date: July 1, 1970

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

Service:

Appointed or elected
prior to 7/1/2010:

Employees receive credit of one month of service multiplied by a weighting factor of 3.5 (2.5 for judges entering JRS on or after January 1, 1995) for each month a contribution is made on their behalf to JRS. This weighted service is used for all purposes under this plan, including determining a member's vested status, determining whether a member is eligible for retirement, computing early retirement reductions, and computing the amount of the benefit. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.

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

Employees receive credit of one month of service multiplied by a tiered weighting factor for each month a contribution is made on their behalf to JRS. First term judges under age 45 at the time of appointment/election use a weighting factor of 1.5, judges age 45 – 54 use a weighting factor of 2.0, and judges age 55 and above use a weighting factor of 2.5. This weighted service is used for all purposes under this plan, including determining a member's vested status, determining whether a member is eligible for retirement, computing early retirement reductions, and computing the amount of the benefit. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.



Schedule B – Judicial Plan Provisions

Average Final Compensation:

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

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

Normal Retirement

Eligibility:

A member may retire upon Normal Retirement on or after age 65 with credit for 5 years of service. The mandatory retirement age for judges is age 73.

Annual Benefit:

1.70% of average final compensation (AFC) times years of service, not to exceed 78% of AFC. For members appointed or elected on or after January 1, 2013, the benefit multiplier is 1.65% and for members appointed or elected on or after January 1, 2014, the benefit multiplier is 1.0%

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



Schedule B – Judicial Plan Provisions

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.

Annual Benefit:

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

Minimum Guaranteed Benefit:

- **Workers Compensation Guarantee:**

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

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



Schedule B – Judicial 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.)

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.



Schedule B – Judicial 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 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).



Schedule B – Judicial Plan Provisions

Work-Related Death:

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

Cost-of-Living Increase:

- Plan 1: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 3% of the Consumer Price Index increase plus half of each percentage increase from 3% to 7%.
- Plan 2 and Hybrid: Members qualify for cost-of-living increases on July 1 of the second calendar year after retirement. Automatic cost-of-living increases are calculated as the first 2% increase of the Consumer Price Index plus half of each percent from 2% to 4%, with the maximum cost-of-living increase of 3%.
- Plans 1, 2 & Hybrid: The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within 5 years of eligibility for unreduced retirement as of January 1, 2013 and to members who retire with twenty or more years of service.



Schedule B – Virginia Law Officers’ Plan Provisions

**VIRGINIA LAW OFFICERS
Plan Specific Benefit Provisions**

- Effective Date:** October 1, 1999
- Type of Plan:** VaLORS is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is considered a single-employer PERS.
- Service:** Employees receive credit of one month of service for each month a contribution is made on their behalf to VaLORS. A member may also purchase credit for certain periods, such as time spent in the military, by paying a purchase rate (5 or 15 percent of the larger of current creditable compensation or final average compensation times the number of years to be purchased). Special rules and limits govern the purchase of additional service.
- Average Final Compensation:**
- Plan 1: The average of the member’s highest 36 consecutive months of salary.
- Plan 2: The average of the member’s highest 60 consecutive months of salary.
- Normal Retirement:** Eligibility:
- A member may retire upon Normal Retirement on or after age 60 with credit for 5 years of service.
- Annual Benefit:
- For all employees hired on or after July 1, 2001, the benefit is calculated as 2.00% of average final compensation (AFC) times years of service.
- Employees hired before July 1, 2001, must make a one-time election to receive benefits under (i) or (ii) below:
- (i) 1.70% of average final compensation (AFC) times years of service plus the temporary supplement described in 5(d).



Schedule B – Virginia Law Officers’ Plan Provisions

(ii) 2.00% of average final compensation (AFC) times years of service and no temporary supplement.

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.



Schedule B – Virginia Law Officers’ Plan Provisions

Payment Form:

Same as for Normal Retirement above.

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 5(b)(i) to receive this supplement.

**Disability Retirement
- Non-VSDP:**

Eligibility:

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

Monthly Benefit:

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



Schedule B – Virginia Law Officers’ Plan Provisions

Minimum Guaranteed Benefit:

- Workers Compensation Guarantee:

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

- Special Retirement Allowance Guarantee:

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

Service Credit:

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

Payment Form:

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

Disability Retirement – VSDP:

Provisions applying to members entering in 1999 or later and continuing members who have elected this benefit: In lieu of the above benefits, these members will be covered by the Virginia Sickness and Disability Program (VSDP). Under VSDP, these members will receive a deferred benefit payable at age 60 from this plan. The deferred benefit will be computed like a normal retirement benefit. For this



Schedule B – Virginia Law Officers’ Plan Provisions

calculation, a member's creditable service will include the period of disability, and the Average Final Compensation will be adjusted to reflect increases in the cost-of-living between the date of disability and age 60. If the member dies while disabled before age 60, a death benefit will be determined as though the employee were an active member.

Deferred Termination Benefit:

Eligibility:

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

Annual Benefit:

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

Payment Form:

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

Death Benefit:

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

Withdrawal (Refund) Benefit:

Eligibility:

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



Schedule B – Virginia Law Officers’ Plan Provisions

Benefit:

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

Death Benefit:

Eligibility:

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

Benefit:

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

Work-Related Death:

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

Cost-of-Living Increase:

Plan 1:

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



Schedule B – Virginia Law Officers’ Plan Provisions

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

Plans 1 & 2: The COLA is deferred for one full calendar year after the member reaches unreduced retirement age. The deferred COLA does not apply to employees within 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 B – 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.



Schedule B – Summary of Plan Changes

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.

2000 Valuation

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

2001 Valuation

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

2003 Valuation

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

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

2007 Valuation

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



Schedule B – Summary of Plan Changes

2011 Valuation

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

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

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

2012 Valuation

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

1. Active non-vested members in Plan 1 will have their Average Final Compensation based on the highest 60 consecutive months of service instead of the highest 36 consecutive months of service. This provision applies to all plans.
2. Active non-vested members in Plan 1 and all Plan 2 members will accrue benefits at 1.65% as of the effective date. This provision applies only to the State and Teacher Plans as well as members in political subdivision plans not covered by hazardous duty benefits members.
3. Active members in the Judicial plan hired after January 1, 2013 will accrue benefits at 1.65%.



Schedule B – Summary of Plan Changes

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 to 4% of their creditable compensation. The maximum employee contribution is 5% of pay.

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

2015 Valuation

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



Schedule C – Statement of Actuarial Assumptions and Methods

SCHEDULE C

STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the valuations were based on the results of an actuarial experience study for the period from July 1, 2012 through June 30, 2016 as well as the investment rate of return of 6.75% adopted by the Board of Trustees at its October 10, 2019 meeting. These assumptions comply with Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* and ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*.

Assumptions and Methods which apply to all VRS Plans

Investment Return Rate:	6.75% per annum, compounded annually, net of investment expenses.
Inflation Assumption:	2.50% per year.
Actuarial Cost Method:	Entry age normal cost method. Actuarial gains and losses are reflected in the unfunded actuarial accrued liability.
Funding Period:	The legacy unfunded actuarial accrued liability less the deferred contribution as of June 30, 2013 is amortized over a closed 30 year period from June 30, 2013. The amortization period of the unfunded less the deferred contribution will decrease by one each year until reaching 0 years. The deferred contribution, as defined under the 2011 Appropriations Act, Item 469(1)(6), has been paid off except for Teachers which is to be amortized using a level-dollar, closed 10 year period beginning June 30, 2011. The actuarial gains and losses and other changes in the unfunded due to benefit and actuarial assumption and method changes for each valuation subsequent to the June 30, 2013 valuation will be amortized over a closed 20 year period. See the Amortization Schedules for more detail.
Payroll Growth Rate:	3% per annum.
Asset Valuation Method:	For purposes of GASB 67, the value of assets is equal to the market value of assets.



Schedule C – Statement of Actuarial Assumptions and Methods

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

Cost-of-living Increase: 2.50% per year compounded annually for Plan 1 members receiving benefits or vested as of January 1, 2013 and 2.25% compounded annually for all other members. The temporary supplement for SPORS and VaLORS members is assumed to be adjusted biennially based on increases of 2.50% per annum compounded annually.

Percent Electing a Deferred Termination Benefit: Terminating members are assumed to elect a return of contributions or a deferred annuity, whichever is the most valuable benefit at the time of termination. Termination benefits are assumed to commence at normal retirement age.

Assumed Payment Form: Modified cash refund annuity; in which the total benefit received by a member and his or her estate cannot be less than the total contributions made by the member while he or she was an active participant. For members in pay status, the modified cash refund was estimated to be in effect for two years after retirement for Judicial members and three years for all others.

Marriage Assumption: 100% of active employees are assumed to be married, with males two years older than females.

Service Related Disability: The service related disability benefits do not include an adjustment for Social Security or Worker’s Compensation benefits.

Hazardous Duty Service: The valuations of SPORS and VaLORS assume that all VRS service is hazardous duty service for purposes of determining eligibility for the temporary supplement.

Administrative Expenses: The employer contribution rates include a rate for anticipated non-investment expenses.



Schedule C – State Employees’ Actuarial Assumptions and Methods

STATE EMPLOYEES

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

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



Schedule C – State Employees’ Actuarial Assumptions and Methods

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

State Employees Retirement Rates, Plan 1 Male							
Age	Years of service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.033	0.033	0.125	0.125
51	0.000	0.000	0.000	0.033	0.030	0.080	0.090
52	0.000	0.000	0.000	0.033	0.030	0.080	0.090
53	0.000	0.000	0.000	0.033	0.030	0.050	0.090
54	0.000	0.000	0.000	0.033	0.030	0.050	0.090
55	0.000	0.045	0.045	0.045	0.035	0.050	0.090
56	0.000	0.045	0.040	0.040	0.040	0.050	0.090
57	0.000	0.045	0.040	0.040	0.040	0.075	0.090
58	0.000	0.045	0.040	0.040	0.040	0.100	0.090
59	0.000	0.045	0.040	0.040	0.040	0.100	0.090
60	0.000	0.045	0.050	0.050	0.050	0.115	0.090
61	0.000	0.150	0.075	0.075	0.075	0.165	0.150
62	0.000	0.150	0.100	0.100	0.100	0.200	0.200
63	0.000	0.150	0.100	0.100	0.100	0.200	0.175
64	0.000	0.150	0.135	0.135	0.135	0.200	0.175
65	0.000	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.275	0.250	0.250	0.250	0.250	0.250
67	0.000	0.275	0.220	0.220	0.220	0.220	0.220
68	0.000	0.200	0.220	0.220	0.220	0.220	0.220
69	0.000	0.200	0.220	0.220	0.220	0.220	0.220
70	0.000	0.200	0.220	0.220	0.220	0.220	0.220
71	0.000	0.200	0.220	0.220	0.220	0.220	0.220
72	0.000	0.200	0.220	0.220	0.220	0.220	0.220
73	0.000	0.200	0.220	0.220	0.220	0.220	0.220
74	0.000	0.200	0.220	0.220	0.220	0.220	0.220
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – State Employees’ Actuarial Assumptions and Methods

State Employees Retirement Rates, Plan 1 Female							
Age	Years of service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.030	0.030	0.075	0.075
51	0.000	0.000	0.000	0.035	0.030	0.075	0.060
52	0.000	0.000	0.000	0.035	0.030	0.075	0.060
53	0.000	0.000	0.000	0.035	0.035	0.100	0.090
54	0.000	0.000	0.000	0.050	0.035	0.100	0.090
55	0.000	0.050	0.050	0.050	0.040	0.100	0.090
56	0.000	0.050	0.050	0.050	0.050	0.100	0.090
57	0.000	0.050	0.050	0.050	0.050	0.100	0.090
58	0.000	0.050	0.050	0.050	0.050	0.100	0.090
59	0.000	0.050	0.050	0.050	0.050	0.100	0.090
60	0.000	0.050	0.050	0.050	0.050	0.120	0.125
61	0.000	0.075	0.080	0.080	0.080	0.165	0.175
62	0.000	0.100	0.120	0.120	0.120	0.225	0.250
63	0.000	0.175	0.120	0.120	0.120	0.225	0.175
64	0.000	0.175	0.150	0.150	0.150	0.225	0.175
65	0.000	0.275	0.275	0.275	0.275	0.275	0.300
66	0.000	0.300	0.300	0.300	0.300	0.300	0.300
67	0.000	0.300	0.250	0.250	0.250	0.250	0.250
68	0.000	0.250	0.250	0.250	0.250	0.250	0.250
69	0.000	0.250	0.250	0.250	0.250	0.250	0.250
70	0.000	0.250	0.250	0.250	0.250	0.250	0.250
71	0.000	0.250	0.250	0.250	0.250	0.250	0.250
72	0.000	0.250	0.250	0.250	0.250	0.250	0.250
73	0.000	0.250	0.250	0.250	0.250	0.250	0.250
74	0.000	0.250	0.250	0.250	0.250	0.250	0.250
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – State Employees’ Actuarial Assumptions and Methods

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

State Employees Retirement Rates, Plan 2 and Hybrid Male																		
Age	Years of service																	
	0-4	5	6-25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.090
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.050	0.090	0.090
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.050	0.090	0.090	0.090
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.050	0.090	0.090	0.090	0.090
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.050	0.090	0.090	0.090	0.090	0.090
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.075	0.090	0.090	0.090	0.090	0.090	0.090
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090	0.090	0.090	0.090	0.090
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
60	0.000	0.045	0.045	0.045	0.045	0.045	0.045	0.115	0.115	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
61	0.000	0.150	0.075	0.075	0.075	0.075	0.165	0.165	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
62	0.000	0.150	0.100	0.100	0.100	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
63	0.000	0.150	0.100	0.100	0.200	0.200	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
64	0.000	0.150	0.135	0.200	0.200	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
65	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
66	0.000	0.275	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
67	0.000	0.275	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
68	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
69	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
70	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
71	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
72	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
73	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
74	0.000	0.200	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – State Employees’ Actuarial Assumptions and Methods

State Employees Retirement Rates, Plan 2 and Hybrid Female																		
Age	Years of service																	
	0-4	5	6-25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.075
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.075	0.060
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090	0.090
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090	0.090	0.090
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090	0.090	0.090	0.090
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090	0.090	0.090	0.090	0.090
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
60	0.000	0.050	0.050	0.050	0.050	0.050	0.050	0.120	0.120	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
61	0.000	0.075	0.080	0.080	0.080	0.080	0.165	0.165	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
62	0.000	0.100	0.120	0.120	0.120	0.225	0.225	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
63	0.000	0.175	0.120	0.120	0.225	0.225	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
64	0.000	0.175	0.150	0.225	0.225	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
65	0.000	0.275	0.275	0.275	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
66	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
67	0.000	0.300	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
68	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
69	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
70	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
71	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
72	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
73	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
74	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – State Employees’ Actuarial Assumptions and Methods

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

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



Schedule C – State Employees’ Actuarial Assumptions and Methods

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

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

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



Schedule C – State Employees’ Actuarial Assumptions and Methods

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

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

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

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



Schedule C – Teachers Actuarial Assumptions and Methods

TEACHERS

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

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



Schedule C – Teachers Actuarial Assumptions and Methods

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

Teachers Retirement Rates, Plan 1 Male							
Age	Years of service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.020	0.020	0.175	0.175
51	0.000	0.000	0.000	0.020	0.020	0.175	0.150
52	0.000	0.000	0.000	0.020	0.020	0.175	0.150
53	0.000	0.000	0.000	0.020	0.020	0.175	0.150
54	0.000	0.000	0.000	0.040	0.035	0.175	0.150
55	0.000	0.070	0.070	0.070	0.045	0.225	0.150
56	0.000	0.070	0.045	0.045	0.045	0.225	0.150
57	0.000	0.070	0.045	0.045	0.045	0.225	0.150
58	0.000	0.070	0.060	0.060	0.060	0.225	0.150
59	0.000	0.100	0.060	0.060	0.060	0.225	0.150
60	0.000	0.100	0.070	0.070	0.070	0.225	0.150
61	0.000	0.110	0.085	0.085	0.085	0.300	0.250
62	0.000	0.170	0.150	0.150	0.150	0.350	0.350
63	0.000	0.140	0.150	0.150	0.150	0.350	0.250
64	0.000	0.180	0.150	0.150	0.150	0.350	0.250
65	0.000	0.300	0.300	0.300	0.300	0.300	0.350
66	0.000	0.275	0.350	0.350	0.350	0.350	0.350
67	0.000	0.300	0.350	0.350	0.350	0.350	0.350
68	0.000	0.300	0.300	0.300	0.300	0.300	0.300
69	0.000	0.300	0.300	0.300	0.300	0.300	0.300
70	0.000	0.300	0.300	0.300	0.300	0.300	0.300
71	0.000	0.300	0.300	0.300	0.300	0.300	0.300
72	0.000	0.300	0.300	0.300	0.300	0.300	0.300
73	0.000	0.300	0.300	0.300	0.300	0.300	0.300
74	0.000	0.300	0.300	0.300	0.300	0.300	0.300
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – Teachers Actuarial Assumptions and Methods

Teachers Retirement Rates, Plan 1 Female							
Age	Years of service						
	0-4	5	6-9	10	11-29	30	>=31
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.024	0.024	0.150	0.150
51	0.000	0.000	0.000	0.035	0.020	0.150	0.100
52	0.000	0.000	0.000	0.035	0.025	0.150	0.100
53	0.000	0.000	0.000	0.035	0.025	0.150	0.100
54	0.000	0.000	0.000	0.040	0.030	0.150	0.100
55	0.000	0.060	0.060	0.060	0.050	0.225	0.160
56	0.000	0.060	0.050	0.050	0.050	0.225	0.160
57	0.000	0.060	0.050	0.050	0.050	0.225	0.160
58	0.000	0.070	0.050	0.050	0.050	0.225	0.160
59	0.000	0.080	0.060	0.060	0.060	0.225	0.200
60	0.000	0.090	0.080	0.080	0.080	0.225	0.200
61	0.000	0.150	0.100	0.100	0.100	0.300	0.250
62	0.000	0.150	0.150	0.150	0.150	0.350	0.300
63	0.000	0.150	0.150	0.150	0.150	0.350	0.300
64	0.000	0.250	0.150	0.150	0.150	0.350	0.300
65	0.000	0.300	0.300	0.300	0.300	0.300	0.350
66	0.000	0.300	0.350	0.350	0.350	0.350	0.350
67	0.000	0.300	0.300	0.300	0.300	0.300	0.300
68	0.000	0.300	0.300	0.300	0.300	0.300	0.300
69	0.000	0.300	0.300	0.300	0.300	0.300	0.300
70	0.000	0.300	0.300	0.300	0.300	0.300	0.300
71	0.000	0.300	0.300	0.300	0.300	0.300	0.300
72	0.000	0.300	0.300	0.300	0.300	0.300	0.300
73	0.000	0.300	0.300	0.300	0.300	0.300	0.300
74	0.000	0.300	0.300	0.300	0.300	0.300	0.300
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – Teachers Actuarial Assumptions and Methods

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

Teachers Retirement Rates, Plan 2 and Hybrid Male																		
Age	Years of service																	
	0-4	5	6-25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.175
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.175	0.150
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.175	0.150	0.150
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.175	0.150	0.150	0.150
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
60	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.225	0.225	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
61	0.000	0.110	0.085	0.085	0.085	0.085	0.300	0.300	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
62	0.000	0.170	0.150	0.150	0.150	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
63	0.000	0.140	0.150	0.150	0.350	0.350	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
64	0.000	0.180	0.150	0.350	0.350	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
65	0.000	0.300	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
66	0.000	0.275	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
67	0.000	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
68	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
69	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
70	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
71	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
72	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
73	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
74	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – Teachers Actuarial Assumptions and Methods

Teachers Retirement Rates, Plan 2 and Hybrid Female																		
Age	Years of service																	
	0-4	5	6-25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	>=40
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.150
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.150	0.100
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.150	0.100	0.100
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.150	0.100	0.100	0.100
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.160	0.160	0.160	0.160
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.160	0.160	0.160	0.160	0.160
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.160	0.160	0.160	0.160	0.160	0.160
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.160	0.160	0.160	0.160	0.160	0.160	0.160
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.225	0.225	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
60	0.000	0.090	0.090	0.090	0.090	0.090	0.090	0.225	0.225	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
61	0.000	0.150	0.100	0.100	0.100	0.100	0.300	0.300	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
62	0.000	0.150	0.150	0.150	0.150	0.350	0.350	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
63	0.000	0.150	0.150	0.150	0.350	0.350	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
64	0.000	0.250	0.150	0.350	0.350	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
65	0.000	0.300	0.300	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
66	0.000	0.300	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
67	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
68	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
69	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
70	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
71	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
72	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
73	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
74	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Schedule C – Teachers Actuarial Assumptions and Methods

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

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



Schedule C – Teachers Actuarial Assumptions and Methods

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

Teachers Termination Rates, Male											
Age	Years of service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.21079	0.14843	0.11901	0.11020	0.09349	0.08050	0.08046	0.07228	0.05097	0.04292	0.04292
25	0.18729	0.14293	0.12175	0.11084	0.09453	0.08071	0.07568	0.06716	0.05060	0.04286	0.04286
30	0.16964	0.13940	0.12584	0.11218	0.09637	0.08159	0.07055	0.06162	0.05134	0.04355	0.04355
35	0.16964	0.13888	0.12459	0.10907	0.09347	0.07931	0.06709	0.05881	0.05210	0.04361	0.03314
40	0.16964	0.13888	0.12078	0.10272	0.08688	0.07483	0.06444	0.05760	0.05255	0.04302	0.02407
45	0.16964	0.13888	0.11573	0.10116	0.07864	0.06940	0.06230	0.05733	0.05243	0.04239	0.02407
50	0.16964	0.13888	0.11233	0.10116	0.07206	0.06391	0.06033	0.05733	0.05234	0.04238	0.02407
55	0.16964	0.13888	0.11217	0.10116	0.07038	0.05844	0.05813	0.05733	0.05234	0.04238	0.02407
60	0.16964	0.13888	0.11217	0.10116	0.07038	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.16964	0.13888	0.11217	0.10116	0.07038	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.16964	0.13888	0.11217	0.10116	0.07038	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Teachers Termination Rates, Female											
Age	Years of service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.18697	0.11393	0.09392	0.09392	0.08483	0.06269	0.04984	0.04984	0.04938	0.04663	0.04663
25	0.18037	0.12332	0.10860	0.10637	0.09381	0.07728	0.06567	0.06507	0.05448	0.04933	0.04933
30	0.17320	0.13889	0.12685	0.11780	0.10503	0.09536	0.08496	0.07332	0.06172	0.05303	0.04656
35	0.16500	0.14138	0.12602	0.11307	0.10178	0.09519	0.08653	0.07385	0.06386	0.05292	0.03931
40	0.15660	0.13208	0.11313	0.09891	0.08919	0.08395	0.07759	0.06810	0.06086	0.04911	0.02568
45	0.15055	0.12047	0.09933	0.08544	0.07686	0.07181	0.06623	0.05912	0.05390	0.04417	0.02287
50	0.14909	0.11617	0.09449	0.08038	0.07126	0.06481	0.05822	0.05346	0.04858	0.04357	0.02287
55	0.14909	0.11617	0.09449	0.08038	0.07093	0.06249	0.05450	0.05326	0.04771	0.04357	0.02287
60	0.14909	0.11617	0.09449	0.08038	0.07093	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.14909	0.11617	0.09449	0.08038	0.07093	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.14909	0.11617	0.09449	0.08038	0.07093	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Schedule C – Teachers Actuarial Assumptions and Methods

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

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

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



Schedule C – State Police Actuarial Assumptions and Methods

STATE POLICE

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

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



Schedule C – State Police Actuarial Assumptions and Methods

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

SPORS Retirement Rates			
Age	Years of service		
	0-4	5-24	>=25
<=49	0.000	0.000	0.000
50	0.000	0.100	0.100
51	0.000	0.030	0.100
52	0.000	0.030	0.100
53	0.000	0.030	0.100
54	0.000	0.030	0.100
55	0.000	0.060	0.100
56	0.000	0.060	0.100
57	0.000	0.060	0.100
58	0.000	0.100	0.100
59	0.000	0.100	0.100
60	0.000	0.100	0.100
61	0.000	0.100	0.100
62	0.000	0.200	0.200
63	0.000	0.200	0.200
64	0.000	0.200	0.200
>=65	0.000	1.000	1.000



Schedule C – State Police Actuarial Assumptions and Methods

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

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

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

SPORS Termination Rates	
Service	Unisex
0	0.09750
1	0.04750
2	0.04750
3	0.04750
4	0.04750
5	0.04750
6	0.04750
7	0.03000
8	0.03000
9	0.03000
>=10	0.01750



Schedule C – 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 C – Judicial Actuarial Assumptions and Methods

JUDICIAL

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

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



Schedule C – Judicial Actuarial Assumptions and Methods

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

Judicial Retirement Rates	
Age	Unisex
<=59	0.000
60	0.150
61	0.150
62	0.150
63	0.150
64	0.150
65	0.150
66	0.150
67	0.150
68	0.150
69	0.150
70	0.500
71	0.500
72	0.500
>=73	1.000

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

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

SALARY INCREASE RATES: Salary increase rates are 4.5%.

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



Schedule C – Virginia Law Officers’ Actuarial Assumptions and Methods

VIRGINIA LAW OFFICERS

Plan Specific Assumptions and Methods

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

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



Schedule C – Virginia Law Officers’ Actuarial Assumptions and Methods

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

VaLORS Retirement Rates, Male					
Age	Years of service				
	0-4	5	6-24	25	>=26
<=49	0.000	0.000	0.000	0.000	0.000
50	0.000	0.110	0.110	0.350	0.350
51	0.000	0.100	0.080	0.300	0.250
52	0.000	0.100	0.080	0.300	0.250
53	0.000	0.100	0.080	0.300	0.250
54	0.000	0.100	0.080	0.240	0.250
55	0.000	0.100	0.080	0.180	0.250
56	0.000	0.100	0.090	0.180	0.200
57	0.000	0.100	0.100	0.180	0.200
58	0.000	0.100	0.100	0.180	0.200
59	0.000	0.100	0.120	0.180	0.200
60	0.000	0.180	0.180	0.180	0.200
61	0.000	0.180	0.200	0.200	0.200
62	0.000	0.180	0.400	0.400	0.400
63	0.000	0.400	0.250	0.250	0.250
64	0.000	0.150	0.250	0.250	0.250
>=65	0.000	1.000	1.000	1.000	1.000



Schedule C – Virginia Law Officers’ Actuarial Assumptions and Methods

VaLORS Retirement Rates, Female					
Age	Years of service				
	0-4	5	6-24	25	>=26
<=49	0.000	0.000	0.000	0.000	0.000
50	0.000	0.100	0.100	0.375	0.375
51	0.000	0.100	0.080	0.250	0.200
52	0.000	0.100	0.080	0.250	0.200
53	0.000	0.100	0.080	0.250	0.225
54	0.000	0.100	0.080	0.250	0.250
55	0.000	0.100	0.080	0.250	0.275
56	0.000	0.100	0.080	0.250	0.300
57	0.000	0.100	0.080	0.250	0.225
58	0.000	0.100	0.080	0.400	0.225
59	0.000	0.100	0.130	0.300	0.225
60	0.000	0.200	0.200	0.200	0.225
61	0.000	0.200	0.225	0.225	0.225
62	0.000	0.200	0.300	0.300	0.300
63	0.000	0.200	0.250	0.250	0.250
64	0.000	0.200	0.250	0.250	0.250
>=65	0.000	1.000	1.000	1.000	1.000



Schedule C – Virginia Law Officers’ Actuarial Assumptions and Methods

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

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



Schedule C – Virginia Law Officers’ Actuarial Assumptions and Methods

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

VaLORS Termination Rates, Male											
Age	Years of service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.31876	0.28460	0.25466	0.22550	0.19680	0.16134	0.13524	0.12367	0.12367	0.12367	0.12367
25	0.30264	0.26915	0.23838	0.20793	0.17797	0.14758	0.12544	0.11510	0.11510	0.11510	0.11510
30	0.28066	0.24612	0.21425	0.18325	0.15307	0.12980	0.11286	0.10375	0.10098	0.10098	0.10098
35	0.25749	0.21974	0.18823	0.16020	0.13400	0.11603	0.10242	0.09350	0.08615	0.07590	0.06050
40	0.23639	0.19311	0.16185	0.13861	0.11962	0.10471	0.09313	0.08358	0.07325	0.05907	0.04275
45	0.22182	0.17034	0.13792	0.12032	0.11173	0.09580	0.08484	0.07391	0.06240	0.05163	0.04275
50	0.21689	0.15441	0.11855	0.10683	0.10683	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.21689	0.14708	0.10525	0.09930	0.09930	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.21689	0.14673	0.09871	0.09787	0.09787	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.21689	0.14673	0.09796	0.09787	0.09787	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.21689	0.14673	0.09796	0.09787	0.09787	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

VaLORS Termination Rates, Female											
Age	Years of service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.34816	0.33235	0.29905	0.25161	0.20346	0.15381	0.13567	0.10072	0.09919	0.09919	0.09919
25	0.33633	0.30645	0.27155	0.23161	0.19212	0.15381	0.13567	0.10072	0.09919	0.09919	0.09919
30	0.32698	0.27494	0.23556	0.20432	0.17667	0.15381	0.13567	0.10072	0.09919	0.09066	0.09066
35	0.32025	0.25204	0.20727	0.17948	0.15980	0.14868	0.13534	0.10072	0.09909	0.08073	0.06058
40	0.31390	0.23286	0.18182	0.15417	0.14036	0.13413	0.12530	0.10072	0.09311	0.07057	0.03901
45	0.30589	0.21487	0.15693	0.12720	0.11803	0.10976	0.10134	0.09113	0.07804	0.06036	0.03687
50	0.29483	0.19601	0.13051	0.09760	0.09281	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.28000	0.17544	0.10155	0.06516	0.06490	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.26118	0.15309	0.06978	0.02989	0.03440	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.23879	0.12934	0.03574	0.00004	0.00182	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.20897	0.10078	0.00000	0.00004	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Schedule C – 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 C – Summary of Actuarial Assumptions and Methods 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 Appropriation Act, Item 469(1)(6), is amortized using a level-dollar, closed, 10 year period beginning June 30, 2011.



Schedule C – Summary of Actuarial Assumptions and Methods Changes

2013 Valuation

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

2017 Valuation

Changes to the actuarial assumptions as a result of the experience study for the four-year period ending June 30, 2016 are summarized below. In addition to these, the spouse age difference was changed from spouses being the same age as participants to males being two years older than females. These changes were reflected in the results for GASB 67 and GASB 68 for the Measurement Date of June 30, 2017.

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

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



Schedule C – Summary of Actuarial Assumptions and Methods Changes

2019 Valuation

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