



Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve



**Virginia
Retirement
System**

GASB STATEMENT NO. 74 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. 74. 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. VRS 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 74.

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
Page 2

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 read 'Alisa Bennett'.

Alisa Bennett, FSA, EA, FCA, MAAA
President

A handwritten signature in blue ink, appearing to read 'Larry Langer'.

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

A handwritten signature in blue ink, appearing to read 'Bradley R. Wild'.

Bradley R. Wild, ASA, FCA, MAAA
Senior Actuary



Table of Contents

<u>Section</u>	<u>Item</u>	<u>Page No.</u>
	Summary of Principal Results	1
	Introduction	12
I	Notes to Financial Statements	14
II	Required Supplementary Information	36
 <u>Appendix</u>		
A	Required Supplementary Information Tables	39
	Exhibit A – Schedule of Changes in the Net OPEB Liability	
	Exhibit B – Schedule of the Not OPEB Liability	
	Exhibit C – Schedule of Employer Contributions	
B	Summary of Main Benefit Provisions	72
C	Statement of Actuarial Assumptions	94
D	Actuarial Cost Method	182



Summary of Principal Results

REPORT OF THE ANNUAL GASB STATEMENT NO. 74 REQUIRED INFORMATION FOR THE VIRGINIA RETIREMENT SYSTEM

GROUP LIFE INSURANCE PROGRAM (\$ IN THOUSANDS)

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	185,605
Inactive Vested Members	0
Inactive Nonvested Members	0
Active Employees	<u>367,903</u>
Total	553,508
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$3,390,238
Fiduciary Net Position (FNP)	<u>1,762,972</u>
Net OPEB Liability (NOL = TOL – FNP)	\$1,627,266
FNP as a percentage of TOL	52.00%



Summary of Principal Results (continued)

**HEALTH INSURANCE CREDIT PROGRAM
STATE EMPLOYEES
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	47,517
Inactive Vested Members	1,794
Inactive Nonvested Members	0
Active Employees	<u>107,234</u>
Total	156,545
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$1,032,094
Fiduciary Net Position (FNP)	<u>109,023</u>
Net OPEB Liability (NOL = TOL – FNP)	\$923,071
FNP as a percentage of TOL	10.56%



Summary of Principal Results (continued)

**HEALTH INSURANCE CREDIT PROGRAM
TEACHERS
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	66,332
Inactive Vested Members	2,340
Inactive Nonvested Members	0
Active Employees	<u>151,585</u>
Total	220,257
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$1,438,114
Fiduciary Net Position (FNP)	<u>129,016</u>
Net OPEB Liability (NOL = TOL – FNP)	\$1,309,098
FNP as a percentage of TOL	8.97%



Summary of Principal Results (continued)

**HEALTH INSURANCE CREDIT PROGRAM
PARTICIPATING LOCAL SUBDIVISIONS
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	5,113
Inactive Vested Members	418
Inactive Nonvested Members	0
Active Employees	<u>23,584</u>
Total	29,115
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date*	7.00%
Single Equivalent Interest Rate at Measurement Date*	7.00%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$42,677
Fiduciary Net Position (FNP)	<u>24,468</u>
Net OPEB Liability (NOL = TOL – FNP)	\$18,209
FNP as a percentage of TOL	57.33%

* There are three participating locals that use the Municipal Bond Rate for their SEIR.



Summary of Principal Results (continued)

**HEALTH INSURANCE CREDIT PROGRAM
CONSTITUTIONAL OFFICERS
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	3,678
Inactive Vested Members	3
Inactive Nonvested Members	0
Active Employees	<u>12,890</u>
Total	16,571
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$31,356
Fiduciary Net Position (FNP)	<u>4,479</u>
Net OPEB Liability (NOL = TOL – FNP)	\$26,877
FNP as a percentage of TOL	14.28%



Summary of Principal Results (continued)

**HEALTH INSURANCE CREDIT PROGRAM
SOCIAL SERVICE EMPLOYEES
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	2,087
Inactive Vested Members	0
Inactive Nonvested Members	0
Active Employees	<u>5,713</u>
Total	7,800
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$14,730
Fiduciary Net Position (FNP)	<u>2,273</u>
Net OPEB Liability (NOL = TOL – FNP)	\$12,457
FNP as a percentage of TOL	15.43%



Summary of Principal Results (continued)

**HEALTH INSURANCE CREDIT PROGRAM
REGISTRARS
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	67
Inactive Vested Members	0
Inactive Nonvested Members	0
Active Employees	<u>233</u>
Total	300
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$590
Fiduciary Net Position (FNP)	<u>87</u>
Net OPEB Liability (NOL = TOL – FNP)	\$503
FNP as a percentage of TOL	14.75%



Summary of Principal Results (continued)

**VIRGINIA SICKNESS AND DISABILITY PROGRAM
LONG-TERM DISABILITY AND LONG-TERM CARE COMBINED
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	4,827
Inactive Vested Members	0
Inactive Nonvested Members	0
Active Employees	<u>75,164</u>
Total	79,991
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$292,046
Fiduciary Net Position (FNP)	<u>488,241</u>
Net OPEB Liability (NOL = TOL – FNP)	(\$196,195)
FNP as a percentage of TOL	167.18%



Summary of Principal Results (continued)

**VIRGINIA LOCAL DISABILITY PROGRAM
TEACHERS
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	6
Inactive Vested Members	0
Inactive Nonvested Members	0
Active Employees	<u>9,332</u>
Total	9,338
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$2,241
Fiduciary Net Position (FNP)	<u>1,661</u>
Net OPEB Liability (NOL = TOL – FNP)	\$580
FNP as a percentage of TOL	74.12%



Summary of Principal Results (continued)

**VIRGINIA LOCAL DISABILITY PROGRAM
POLITICAL SUBDIVISIONS
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	25
Inactive Vested Members	0
Inactive Nonvested Members	0
Active Employees	<u>7,915</u>
Total	7,940
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	7.00%
Single Equivalent Interest Rate at Measurement Date	6.75%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$3,989
Fiduciary Net Position (FNP)	<u>1,962</u>
Net OPEB Liability (NOL = TOL – FNP)	\$2,027
FNP as a percentage of TOL	49.19%



Summary of Principal Results (continued)

**LINE OF DUTY ACT
(\$ IN THOUSANDS)**

Valuation Date (VD):	July 1, 2018
Prior Measurement Date:	June 30, 2018
Measurement Date (MD):	June 30, 2019
Membership Data:	
Retirees and Beneficiaries	1,115
Inactive Vested Members	0
Inactive Nonvested Members	0
Active Employees	<u>19,014</u>
Total	20,129
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	4.75%
Municipal Bond Index Rate at Prior Measurement Date	3.89%
Municipal Bond Index Rate at Measurement Date	3.50%
Year in which Fiduciary Net Position is Projected to be Depleted	2019
Single Equivalent Interest Rate at Prior Measurement Date	3.89%
Single Equivalent Interest Rate at Measurement Date	3.50%
Net OPEB Liability:	
Total OPEB Liability (TOL)	\$361,626
Fiduciary Net Position (FNP)	<u>2,839</u>
Net OPEB Liability (NOL = TOL – FNP)	\$358,787
FNP as a percentage of TOL	0.79%



Introduction

The Governmental Accounting Standards Board issued Statement No. 74 (GASB 74), “*Financial Reporting for Postemployment Benefit Plans other than Pension Plans*,” in June 2015. The effective date for reporting under GASB 74 for the Virginia Retirement System was fiscal year ending June 30, 2019.

This report, prepared as of June 30, 2019 (the Measurement Date), presents information to assist the Virginia Retirement System in meeting the requirements of GASB 74. Much of the material provided in this report is based on the data, assumptions and results of the annual actuarial valuation of the System performed as of July 1, 2018 (the Valuation Date). The results of that valuation are detailed in a separate report. VRS 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.

GASB 74 replaces GASB 43 and represents a significant departure from the requirements of the prior statement. GASB 43 was issued as a “funding friendly” statement that required postemployment benefit plans other than pension plans (OPEB) to report items consistent with the results of the plan’s actuarial valuations, as long as those valuations met certain parameters. GASB 74 basically separates accounting from funding by creating disclosure and reporting requirements that may or may not be consistent with the basis used for funding the Plan.

A major change in GASB 74 is the requirement to determine the Total OPEB Liability (TOL) utilizing the Entry Age Normal actuarial cost method. The Net OPEB Liability (NOL) is then set equal to the TOL minus the Plan’s Fiduciary Net Position (FNP) (basically the fair (market) value of assets). The benefit provisions recognized in the calculation of the TOL are summarized in Appendix B.

Among the items needed for the liability calculation is the discount rate, or Single Equivalent Interest Rate (SEIR), as described by GASB 74. To determine the SEIR, the FNP must be projected, using GASB 74 guidelines, into the future for as long as there are anticipated benefits payable under the plan’s provisions applicable to the members and beneficiaries of the System on the Measurement Date. If the FNP is not projected to 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.



Introduction (continued)

If, however, the FNP is projected to be depleted at a future measurement date, 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) (3.50%).

Our calculations indicate that the FNP is not projected to be depleted, so the Municipal Bond Index Rate is not used in the determination of the SEIR for either the July 1, 2018 or the June 30, 2019 TOL. The SEIR is 6.75% at June 30, 2019 and 7.00% at June 30, 2018, the long-term assumed rate of return on investments in effect at the respective Measurement Dates. For Line of Duty Act The SEIR is 3.50% at June 30, 2019 and 3.89% at July 1, 2018. Please see Paragraph 35.b.(2) for more explanation of the development of the SEIR.

The FNP projections are based upon Virginia Retirement System's financial status on the Measurement Date, the indicated set of methods and assumptions, and the requirements of GASB 74. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing plan basis, reflecting the impact of future members. Therefore, the results of this test do not necessarily indicate whether or not the fund will actually run out of money, the financial condition of the System, or the System's ability to make benefit payments in future years.

The sections that follow provide the results of all the necessary calculations, presented in the order laid out in GASB 74 for note disclosure and Required Supplementary Information (RSI).



Section I – Notes to Financial Statements

The material presented herein will follow the order presented in GASB 74. Paragraph numbers are provided for ease of reference.

Paragraphs 34.a. (1)-(3): This information will be supplied by the System.

Paragraph 34.a. (4): The data required regarding the membership of the System were furnished by the System. The following table summarizes the membership of the System as of July 1, 2018, the date of the valuation used to determine the June 30, 2019 Total OPEB Liability.



Section I – Notes to Financial Statements (continued)

Membership

GROUP LIFE INSURANCE PROGRAM

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	185,605
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	-
Receiving Benefits	
Nonvested Terminations	-
Active Members	367,903
Total	553,508

HEALTH INSURANCE CREDIT PROGRAM – STATE EMPLOYEES

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	47,517
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	1,794
Receiving Benefits	
Nonvested Terminations	-
Active Members	107,234
Total	156,545



Section I – Notes to Financial Statements (continued)

Membership (continued)

HEALTH INSURANCE CREDIT PROGRAM – TEACHERS

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	66,332
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	2,340
Receiving Benefits	
Nonvested Terminations	-
Active Members	151,585
Total	220,257

HEALTH INSURANCE CREDIT PROGRAM – PARTICIPATING LOCAL SUBDIVISIONS

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	5,113
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	418
Receiving Benefits	
Nonvested Terminations	-
Active Members	23,584
Total	29,115



Section I – Notes to Financial Statements (continued)

Membership (continued)

HEALTH INSURANCE CREDIT PROGRAM – CONSTITUTIONAL OFFICERS

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	3,678
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	3
Receiving Benefits	
Nonvested Terminations	-
Active Members	12,890
Total	16,571

HEALTH INSURANCE CREDIT PROGRAM – SOCIAL SERVICE EMPLOYEES

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	2,087
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	-
Receiving Benefits	
Nonvested Terminations	-
Active Members	5,713
Total	7,800



Section I – Notes to Financial Statements (continued)

Membership (continued)

HEALTH INSURANCE CREDIT PROGRAM – REGISTRARS

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	67
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	-
Receiving Benefits	
Nonvested Terminations	-
Active Members	233
Total	300

VIRGINIA SICKNESS AND DISABILITY PROGRAM

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	4,827
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	-
Receiving Benefits	
Nonvested Terminations	-
Active Members	75,164
Total	79,991



Section I – Notes to Financial Statements (continued)

Membership (continued)

VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	6
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	-
Receiving Benefits	
Nonvested Terminations	-
Active Members	9,332
Total	9,338

VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	25
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	-
Receiving Benefits	
Nonvested Terminations	-
Active Members	7,915
Total	7,940



Section I – Notes to Financial Statements (continued)

Membership (continued)

LINE OF DUTY ACT

Number as of July 1, 2018	
Inactive Members Or Their Beneficiaries	1,115
Currently Receiving Benefits	
Inactive Members Entitled To But Not Yet	-
Receiving Benefits	
Nonvested Terminations	-
Active Members	19,014
Total	20,129

Paragraphs 34.a. (5)-(6) and Paragraphs 34.b.-e.: This information will be supplied by the System.

Paragraph 35.a. (1)-(4): As stated earlier, the NOL is equal to the TOL minus the FNP. That result, as of June 30, 2019, is presented in the following table.



Section I – Notes to Financial Statements (continued)

Net OPEB Liability

GROUP LIFE INSURANCE PROGRAM
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	3,390,238
Fiduciary Net Position		<u>1,762,972</u>
Net OPEB Liability	\$	1,627,266
Ratio of Fiduciary Net Position to Total OPEB Liability		52.00%

HEALTH INSURANCE CREDIT PROGRAM – STATE EMPLOYEES
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	1,032,094
Fiduciary Net Position		<u>109,023</u>
Net OPEB Liability	\$	923,071
Ratio of Fiduciary Net Position to Total OPEB Liability		10.56%



Section I – Notes to Financial Statements (continued)

Net OPEB Liability (continued)

HEALTH INSURANCE CREDIT PROGRAM – TEACHERS
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	1,438,114
Fiduciary Net Position		<u>129,016</u>
Net OPEB Liability	\$	1,309,098
Ratio of Fiduciary Net Position to Total OPEB Liability		8.97%

HEALTH INSURANCE CREDIT PROGRAM – PARTICIPATING LOCAL SUBDIVISIONS
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	42,677
Fiduciary Net Position		<u>24,468</u>
Net OPEB Liability	\$	18,209
Ratio of Fiduciary Net Position to Total OPEB Liability		57.33%



Section I – Notes to Financial Statements (continued)

Net OPEB Liability (continued)

**HEALTH INSURANCE CREDIT PROGRAM – CONSTITUTIONAL OFFICERS
(\$ in Thousands)**

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	31,356
Fiduciary Net Position		<u>4,479</u>
Net OPEB Liability	\$	26,877
Ratio of Fiduciary Net Position to Total OPEB Liability		14.28%

**HEALTH INSURANCE CREDIT PROGRAM – SOCIAL SERVICE EMPLOYEES
(\$ in Thousands)**

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	14,730
Fiduciary Net Position		<u>2,273</u>
Net OPEB Liability	\$	12,457
Ratio of Fiduciary Net Position to Total OPEB Liability		15.43%



Section I – Notes to Financial Statements (continued)

Net OPEB Liability (continued)

HEALTH INSURANCE CREDIT PROGRAM – REGISTRARS
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	590
Fiduciary Net Position		<u>87</u>
Net OPEB Liability	\$	503
Ratio of Fiduciary Net Position to Total OPEB Liability		14.75%

VIRGINIA SICKNESS AND DISABILITY PROGRAM
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	292,046
Fiduciary Net Position		<u>488,241</u>
Net OPEB Liability	\$	(196,195)
Ratio of Fiduciary Net Position to Total OPEB Liability		167.18%



Section I – Notes to Financial Statements (continued)

Net OPEB Liability (continued)

VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	2,241
Fiduciary Net Position		<u>1,661</u>
Net OPEB Liability	\$	580
Ratio of Fiduciary Net Position to Total OPEB Liability		74.12%

VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	3,989
Fiduciary Net Position		<u>1,962</u>
Net OPEB Liability	\$	2,027
Ratio of Fiduciary Net Position to Total OPEB Liability		49.19%



Section I – Notes to Financial Statements (continued)

Net OPEB Liability (continued)

LINE OF DUTY ACT
(\$ in Thousands)

Fiscal Year Ending June 30, 2019		
Total OPEB Liability	\$	361,626
Fiduciary Net Position		<u>2,839</u>
Net OPEB Liability	\$	358,787
Ratio of Fiduciary Net Position to Total OPEB Liability		0.79%



Section I – Notes to Financial Statements (continued)

Paragraph 35.b.: This paragraph requires information to be disclosed regarding the actuarial assumptions and other inputs used to measure the TOL. The complete set of actuarial assumptions and other inputs utilized in developing the TOL are outlined in Appendix C. The TOL as of June 30, 2019 was determined based on an actuarial valuation prepared as of July 1, 2018, using the following actuarial assumptions and other inputs:

Price Inflation	2.50 percent
Salary Increases, Including Price Inflation	State Employees: 3.50 to 5.35 percent Teachers: 3.50 to 5.95 percent State Police: 3.50 to 4.75 percent Judicial: 4.50 percent VaLORS: 3.50 to 4.75 percent Political Subdivisions: General Employees: 3.50 – 5.35 percent Public Safety: 3.50 to 4.75 percent
Long-term Rate of Return, net of investment expense, including price inflation	6.75 percent Line of Duty Act: 4.75 percent
Municipal Bond Index Rate	
Prior Measurement Date	3.89 percent
Measurement Date	3.50 percent
Year FNP is projected to be depleted	N/A Line of Duty Act: 2019
Single Equivalent Interest Rate, net of plan investment expense, including price inflation	
Prior Measurement Date	7.00 percent Line of Duty Act: 3.89 percent
Measurement Date	6.75 percent Line of Duty Act: 3.50 percent
Healthcare Cost Trend Rate	N/A
(Applies only to Line of Duty Act)	
Medical Trend Assumption (Under Age 65)	7.25% - 4.75%
Medical Trend Assumption (Ages 65 and Older)	5.50% - 4.75%



Section I – Notes to Financial Statements (continued)

Year of Ultimate Trend Rate

(Applies only to Line of Duty Act)

Fiscal Year Ended 2028

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 Appendix C for the specific adjustments for each plan, other than Political Subdivision plans. For the adjustments applicable to the Political Subdivision plans refer to each plan's individual valuation report.

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 TOL as of July 1, 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 recently adopted investment rate of return of 6.75%.

Paragraph 35.b.(1)

Sensitivity analysis: The disclosure of the sensitivity of the Net OPEB Liability to changes in the healthcare cost trend rate. The TOL is based on a medical benefit that is a flat dollar amount, therefore, it is unaffected by a healthcare cost trend rate. An increase or decrease in the trend rate would have no effect on the TOL.

For Line of Duty Act, the following presents the NOL of the System, calculated using the trend rate of 7.25 – 4.75 percent for pre-Medicare and 5.50 – 4.75 percent for Medicare eligible, as well as the System's NOL calculated using a health care trend rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate.



Section I – Notes to Financial Statements (continued)

	1% Decrease in Healthcare Trend Rate	Current Healthcare Trend Rate	1% Increase in Healthcare Trend Rate
Net OPEB Liability	\$303,352	\$358,787	\$428,698

Paragraph 35.b.(2)

(a) Discount rate (SEIR): The discount rate used to measure the TOL at June 30, 2018 was 6.75 percent, except for Line of Duty Act and three HIC Political Subdivisions plans – Carroll County School Board (55517), Russell County School Board (55583), and Jackson River Technical Center (55814) – with a discount rate of 3.50%, equal to the municipal bond 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.



Section I – Notes to Financial Statements (continued)

- (a) **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%.



Section I – Notes to Financial Statements (continued)

(b) Municipal bond rate: A municipal bond rate was not used in determining the discount rate, except for Line of Duty Act and three HIC Political Subdivisions plans – Carroll County School Board (55517), Russell County School Board (55583), and Jackson River Technical Center (55814). To measure the TOL for these three plans, the Single Equivalent Interest Rate (SEIR) we have used is the applicable municipal bond index rate of 3.50%, based on the Bond Buyer General Obligation 20-year Municipal Bond Index (formerly published monthly by the Board of Governors of the Federal Reserve System) as of the measurement date of June 30, 2019.

(c) Periods of projected benefit payments: Projected future benefit payments for all current plan members until benefit payments ran out.

For Line of Duty Act, the projected future benefit payments for all current plan members were not projected because the plan is a pay-as-you-go plan.

(d) 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

For Line of Duty Act, the assumed asset allocations were not used because the plan is a pay-as-you-go plan.



Section I – Notes to Financial Statements (continued)

(g) **Sensitivity analysis:** This paragraph requires disclosure of the sensitivity of the NOL to changes in the discount rate. The following presents the NOL of the System, calculated using the discount rate of 6.75 percent, as well as the System's NOL 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. The sensitivity analysis for the Line of Duty Act and the three HIC Political Subdivision plans is included at the municipal bond index rate of 3.50% and at 2.50% and 4.50%.

Sensitivity Analysis GROUP LIFE INSURANCE PROGRAM (\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$2,137,778	\$1,627,266	\$1,213,257

HEALTH INSURANCE CREDIT PROGRAM – STATE EMPLOYEES (\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$1,023,067	\$923,071	\$837,133



Section I – Notes to Financial Statements (continued)

Sensitivity Analysis (continued)

HEALTH INSURANCE CREDIT PROGRAM – TEACHERS
(\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$1,465,102	\$1,309,098	\$1,176,571

HEALTH INSURANCE CREDIT PROGRAM – PARTICIPATING LOCAL SUBDIVISIONS
(\$ in Thousands)

	1% Decrease	Current Discount Rate	1% Increase
Net OPEB Liability	\$23,385	\$18,209	\$14,740

HEALTH INSURANCE CREDIT PROGRAM – CONSTITUTIONAL OFFICERS
(\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$30,245	\$26,877	\$24,017



Section I – Notes to Financial Statements (continued)

Sensitivity Analysis (continued)

HEALTH INSURANCE CREDIT PROGRAM – SOCIAL SERVICE EMPLOYEES
(\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$13,898	\$12,457	\$11,223

HEALTH INSURANCE CREDIT PROGRAM – REGISTRARS
(\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$556	\$503	\$457

VIRGINIA SICKNESS AND DISABILITY PROGRAM
(\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	(\$178,143)	(\$196,195)	(\$212,189)



Section I – Notes to Financial Statements (continued)

Sensitivity Analysis (continued)

VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS (\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$853	\$580	\$344

VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS (\$ in Thousands)

	1% Decrease (5.75%)	Current Discount Rate (6.75%)	1% Increase (7.75%)
Net OPEB Liability	\$2,332	\$2,027	\$1,762

LINE OF DUTY ACT (\$ in Thousands)

	1% Decrease (2.50%)	Current Discount Rate (3.50%)	1% Increase (4.50%)
Net OPEB Liability	\$416,220	\$358,787	\$313,363

Paragraph 35.c.: July 1, 2018 is the actuarial valuation date upon which the TOL is based. That result was rolled forward using standard actuarial techniques to the Measurement Date of June 30, 2019.



Section II – Required Supplementary Information

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

Paragraphs 36(a)-(c): The required tables of schedules are provided in Appendix A.

Paragraph 36(d): The money-weighted rates of return will be supplied by the System.

Paragraph 38: The following information should be noted regarding the RSI, particularly for the *Schedule of Employer Contributions*:

Changes of benefit and funding terms. There have been no significant changes to the System benefit provisions since the prior actuarial valuation. The mandatory retirement age for most judges was increased from age 70 to age 73. 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. Additionally, the SEIR for the Line of Duty Act has been updated from 3.89% to 3.50% to reflect the change in the municipal bond rate. 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. 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.



Section II – Required Supplementary Information (continued)

The System is funded with fixed contribution rates for the state and with varying contributions for employees based on their job and personal elections. The Actuarially Determined Contributions in the *Schedule of Employer Contributions* are calculated as of the beginning of the fiscal year in which contributions are reported.

The following actuarial methods and assumptions (from the July 1, 2017 actuarial valuation) were used to determine the Actuarially Determined Contribution reported for Fiscal Year End 2017 in that schedule:

Actuarial Cost Method	Entry age normal
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 moving average
Price Inflation	2.50 percent
Salary Increases, Including Price Inflation	State Employees: 3.50 to 5.35 percent Teachers: 3.50 to 5.95 percent State Police: 3.50 to 4.75 percent Judicial: 4.50 percent VaLORS: 3.50 to 4.75 percent Political Subdivisions: General Employees: 3.50 – 5.35 percent Public Safety: 3.50 to 4.75 percent
Long-term Rate of Return, net of investment expense, including price inflation	7.00 percent
Healthcare Cost Trend Rate (Applies only to Line of Duty Act)	Line of Duty Act*: 4.75% N/A
Medical Trend Assumption (Under Age 65)	7.50% - 5.00%
Medical Trend Assumption (Ages 65+)	5.50% - 5.00%
Year of Ultimate Trend Rate (Applies only to Line of Duty Act)	Fiscal Year Ended 2024

*The assumed investment rate of return for the Line of Duty Act plan reflects the fact that the Plan is to be funded on a current disbursement basis.



Section II – Required Supplementary Information (continued)

Please see the information presented in this Paragraph 38 for detailed information on the benefit changes and assumption changes that may have impacted the Actuarially Determined Contributions shown in the *Schedule of Employer Contributions*.



Appendix A – Required Supplementary Information Tables

Exhibit A
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
GROUP LIFE INSURANCE PROGRAM
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$86,912	\$84,355	\$81,479							
Interest	210,950	198,960	201,770							
Benefit changes	0	0	0							
Difference between expected and actual experience	56,736	88,052	(39,461)							
Changes of assumptions	122,011	0	(91,738)							
Benefit payments	(199,879)	(200,285)	(184,092)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$276,730	\$171,082	(\$32,042)							
Total OPEB Liability - beginning	\$3,113,508	\$2,942,426	\$2,974,468							
Total OPEB Liability - ending (a)	\$3,390,238	\$3,113,508	\$2,942,426							
Plan Fiduciary Net Position										
Contributions – employer	\$102,175	\$98,530	\$94,082							
Contributions – non-employer	0	0	0							
Contributions – member	155,153	150,402	146,002							
Net investment income	113,440	110,917	158,430							
Benefit payments	(199,879)	(200,285)	(184,092)							
Administrative expense	(709)	(664)	(31)							
Refunds of contributions	0	0	0							
Other	(1,981)	(1,713)	(1,731)							
Net change in Plan Fiduciary Net Position	\$168,199	\$157,187	\$212,660							
Plan Fiduciary Net Position – beginning	\$1,594,773	\$1,437,586	\$1,224,926							
Plan Fiduciary Net Position - ending (b)	1,762,972	1,594,773	1,437,586							
Net OPEB Liability - ending (a) - (b)	\$1,627,266	\$1,518,735	\$1,504,840							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – STATE EMPLOYEES
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$19,446	\$19,645	\$19,231							
Interest	68,023	66,883	66,641							
Benefit changes	0	0	0							
Difference between expected and actual experience	(13,402)	745	0							
Changes of assumptions	22,700	0	(12,229)							
Benefit payments	(72,857)	(69,117)	(71,256)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$23,910	\$18,156	\$2,387							
Total OPEB Liability - beginning	\$1,008,184	\$990,028	\$987,641							
Total OPEB Liability - ending (a)	\$1,032,094	\$1,008,184	\$990,028							
Plan Fiduciary Net Position										
Contributions – employer	\$79,926	\$79,416	\$75,058							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	6,189	5,706	7,706							
Benefit payments	(72,857)	(69,117)	(71,256)							
Administrative expense	(135)	(149)	(131)							
Refunds of contributions	0	0	0							
Other	(8)	536	(546)							
Net change in Plan Fiduciary Net Position	\$13,115	\$16,392	\$10,831							
Plan Fiduciary Net Position – beginning	\$95,908	\$79,516	\$68,685							
Plan Fiduciary Net Position - ending (b)	109,023	95,908	79,516							
Net OPEB Liability - ending (a) - (b)	\$923,071	\$912,276	\$910,512							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – TEACHERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$20,979	\$20,887	\$20,351							
Interest	93,526	92,399	91,661							
Benefit changes	0	0	0							
Difference between expected and actual experience	(2,397)	(7,255)	0							
Changes of assumptions	35,148	0	(15,003)							
Benefit payments	(90,455)	(89,420)	(83,510)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$56,801	\$16,611	\$13,499							
Total OPEB Liability - beginning	\$1,381,313	\$1,364,702	\$1,351,203							
Total OPEB Liability - ending (a)	\$1,438,114	\$1,381,313	\$1,364,702							
Plan Fiduciary Net Position										
Contributions – employer	\$100,643	\$99,469	\$87,613							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	7,350	6,097	8,818							
Benefit payments	(90,455)	(89,420)	(83,510)							
Administrative expense	(152)	(152)	(120)							
Refunds of contributions	0	0	0							
Other	(9)	(446)	436							
Net change in Plan Fiduciary Net Position	\$17,377	\$15,548	\$13,237							
Plan Fiduciary Net Position – beginning	\$111,639	\$96,091	\$82,854							
Plan Fiduciary Net Position - ending (b)	129,016	111,639	96,091							
Net OPEB Liability - ending (a) - (b)	\$1,309,098	\$1,269,674	\$1,268,611							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – POLITICAL LOCAL SUBDIVISIONS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$997	\$960	\$972							
Interest	2,721	2,644	2,618							
Benefit changes	0	0	0							
Difference between expected and actual experience	964	339	0							
Changes of assumptions	199	0	(1,015)							
Benefit payments	(2,564)	(2,707)	(1,676)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$2,317	\$1,236	\$899							
Total OPEB Liability - beginning	\$40,360	\$39,124	\$38,225							
Total OPEB Liability - ending (a)	\$42,677	\$40,360	\$39,124							
Plan Fiduciary Net Position										
Contributions – employer	\$2,406	\$2,291	\$2,164							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	1,490	1,570	2,273							
Benefit payments	(2,564)	(2,707)	(1,676)							
Administrative expense	(32)	(37)	(37)							
Refunds of contributions	0	0	0							
Other	(2)	(103)	111							
Net change in Plan Fiduciary Net Position	\$1,298	\$1,014	\$2,835							
Plan Fiduciary Net Position – beginning	\$23,170	\$22,156	\$19,321							
Plan Fiduciary Net Position - ending (b)	24,468	23,170	22,156							
Net OPEB Liability - ending (a) - (b)	\$18,209	\$17,190	\$16,968							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – CONSTITUTIONAL OFFICERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$687	\$677	\$671							
Interest	2,010	1,913	1,890							
Benefit changes	0	0	0							
Difference between expected and actual experience	97	569	0							
Changes of assumptions	758	0	(578)							
Benefit payments	(1,825)	(1,723)	(1,568)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$1,727	\$1,436	\$415							
Total OPEB Liability - beginning	\$29,629	\$28,193	\$27,778							
Total OPEB Liability - ending (a)	\$31,356	\$29,629	\$28,193							
Plan Fiduciary Net Position										
Contributions – employer	\$2,794	\$2,378	\$2,320							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	238	183	215							
Benefit payments	(1,825)	(1,723)	(1,568)							
Administrative expense	(6)	(4)	(4)							
Refunds of contributions	0	0	0							
Other	0	17	(15)							
Net change in Plan Fiduciary Net Position	\$1,201	\$851	\$948							
Plan Fiduciary Net Position – beginning	\$3,278	\$2,427	\$1,479							
Plan Fiduciary Net Position - ending (b)	4,479	3,278	2,427							
Net OPEB Liability - ending (a) - (b)	\$26,877	\$26,351	\$25,766							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – SOCIAL SERVICE EMPLOYEES
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$260	\$257	\$263							
Interest	960	933	928							
Benefit changes	0	0	0							
Difference between expected and actual experience	(27)	186	0							
Changes of assumptions	327	0	(162)							
Benefit payments	(1,012)	(970)	(928)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$508	\$406	\$101							
Total OPEB Liability - beginning	\$14,222	\$13,816	\$13,715							
Total OPEB Liability - ending (a)	\$14,730	\$14,222	\$13,816							
Plan Fiduciary Net Position										
Contributions – employer	\$1,847	\$1,120	\$1,069							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	122	72	98							
Benefit payments	(1,012)	(970)	(928)							
Administrative expense	(3)	(1)	(2)							
Refunds of contributions	0	0	0							
Other	0	7	(7)							
Net change in Plan Fiduciary Net Position	\$954	\$228	\$230							
Plan Fiduciary Net Position – beginning	\$1,319	\$1,091	\$861							
Plan Fiduciary Net Position - ending (b)	2,273	1,319	1,091							
Net OPEB Liability - ending (a) - (b)	\$12,457	\$12,903	\$12,725							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – REGISTRARS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$16	\$12	\$12							
Interest	39	36	35							
Benefit changes	0	0	0							
Difference between expected and actual experience	(22)	1	0							
Changes of assumptions	12	0	(10)							
Benefit payments	(12)	(12)	(27)							
Refunds of contributions	<u>0</u>	<u>0</u>	<u>0</u>							
Net change in Total OPEB Liability	\$33	\$37	\$10							
Total OPEB Liability - beginning	\$557	\$520	\$510							
Total OPEB Liability - ending (a)	\$590	\$557	\$520							
Plan Fiduciary Net Position										
Contributions – employer	\$36	\$32	\$47							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	5	4	3							
Benefit payments	(12)	(12)	(27)							
Administrative expense	0	0	0							
Refunds of contributions	0	0	0							
Other	<u>0</u>	<u>0</u>	<u>0</u>							
Net change in Plan Fiduciary Net Position	\$29	\$24	\$23							
Plan Fiduciary Net Position – beginning	\$58	\$34	\$11							
Plan Fiduciary Net Position - ending (b)	87	58	34							
Net OPEB Liability - ending (a) - (b)	\$503	\$499	\$486							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
VIRGINIA SICKNESS AND DISABILITY PROGRAM
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$29,232	\$27,527	\$27,884							
Interest	15,788	15,503	15,810							
Benefit changes	0	0	0							
Difference between expected and actual experience	29,489	(11,237)	0							
Changes of assumptions	4,180	0	(17,511)							
Benefit payments	(24,376)	(31,073)	(30,056)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$54,313	\$720	(\$3,873)							
Total OPEB Liability - beginning	\$237,733	\$237,013	\$240,886							
Total OPEB Liability - ending (a)	\$292,046	\$237,733	\$237,013							
Plan Fiduciary Net Position										
Contributions – employer	\$25,263	\$27,260	\$24,130							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	30,494	32,073	48,206							
Benefit payments	(24,376)	(31,073)	(30,056)							
Administrative expense	(7,218)	(7,598)	(7,718)							
Refunds of contributions	0	0	0							
Other	1,117	(35)	(54)							
Net change in Plan Fiduciary Net Position	\$25,280	\$20,627	\$34,508							
Plan Fiduciary Net Position – beginning	\$462,961	\$442,334	\$407,826							
Plan Fiduciary Net Position - ending (b)	488,241	462,961	442,334							
Net OPEB Liability - ending (a) - (b)	(\$196,195)	(\$225,228)	(\$205,321)							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$871	\$668	\$389							
Interest	92	57	29							
Benefit changes	0	0	0							
Difference between expected and actual experience	(19)	(66)	0							
Changes of assumptions	63	0	53							
Benefit payments	(167)	(131)	(36)							
Refunds of contributions	<u>0</u>	<u>0</u>	<u>0</u>							
Net change in Total OPEB Liability	\$840	\$528	\$435							
Total OPEB Liability - beginning	\$1,401	\$873	\$438							
Total OPEB Liability - ending (a)	\$2,241	\$1,401	\$873							
Plan Fiduciary Net Position										
Contributions – employer	\$1,966	\$1,160	\$589							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	83	29	0							
Benefit payments	(167)	(131)	(36)							
Administrative expense	(868)	(870)	(568)							
Refunds of contributions	0	0	0							
Other	<u>0</u>	<u>180</u>	<u>294</u>							
Net change in Plan Fiduciary Net Position	\$1,014	\$368	\$279							
Plan Fiduciary Net Position – beginning	\$647	\$279	\$0							
Plan Fiduciary Net Position - ending (b)	1,661	647	279							
Net OPEB Liability - ending (a) - (b)	\$580	\$754	\$594							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$1,191	\$876	\$664							
Interest	105	58	25							
Benefit changes	0	0	0							
Difference between expected and actual experience	1,224	(95)	0							
Changes of assumptions	69	0	(110)							
Benefit payments	(188)	(165)	(44)							
Refunds of contributions	<u>0</u>	<u>0</u>	<u>0</u>							
Net change in Total OPEB Liability	\$2,401	\$674	\$535							
Total OPEB Liability - beginning	\$1,588	\$914	\$379							
Total OPEB Liability - ending (a)	\$3,989	\$1,588	\$914							
Plan Fiduciary Net Position										
Contributions – employer	\$2,226	\$1,463	\$740							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	93	36	0							
Benefit payments	(188)	(165)	(44)							
Administrative expense	(985)	(1,096)	(715)							
Refunds of contributions	0	0	0							
Other	<u>0</u>	<u>227</u>	<u>370</u>							
Net change in Plan Fiduciary Net Position	\$1,146	\$465	\$351							
Plan Fiduciary Net Position – beginning	\$816	\$351	\$0							
Plan Fiduciary Net Position - ending (b)	1,962	816	351							
Net OPEB Liability - ending (a) - (b)	\$2,027	\$772	\$563							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit A (continued)
GASB 74 Paragraph 36.a.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
LINE OF DUTY ACT
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost	\$13,292	\$15,197	\$17,648							
Interest	\$12,019	9,258	8,305							
Benefit changes	\$0	0	0							
Difference between expected and actual experience	\$14,833	51,048	0							
Changes of assumptions	\$18,941	(13,962)	(30,500)							
Benefit payments	(\$12,854)	(12,398)	(10,255)							
Refunds of contributions	0	0	0							
Net change in Total OPEB Liability	\$46,231	\$49,143	(\$14,802)							
Total OPEB Liability - beginning	\$315,395	\$266,252	\$281,054							
Total OPEB Liability - ending (a)	\$361,626	\$315,395	\$266,252							
Plan Fiduciary Net Position										
Contributions – employer	\$13,377	\$10,035	\$11,024							
Contributions – non-employer	0	0	0							
Contributions – member	0	0	0							
Net investment income	277	678	683							
Benefit payments	(12,854)	(12,398)	(10,255)							
Administrative expense	(508)	(742)	(1,283)							
Refunds of contributions	0	0	0							
Other	658	855	584							
Net change in Plan Fiduciary Net Position	\$950	(\$1,572)	\$753							
Plan Fiduciary Net Position – beginning	\$1,889	\$3,461	\$2,708							
Plan Fiduciary Net Position - ending (b)	2,839	1,889	3,461							
Net OPEB Liability - ending (a) - (b)	\$358,787	\$313,506	\$262,791							



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B
GASB 74 Paragraph 36.b.
SCHEDULE OF THE NET OPEB LIABILITY
GROUP LIFE INSURANCE PROGRAM
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$3,390,238	\$3,113,508	\$2,942,426							
Plan Fiduciary Net Position	<u>1,762,972</u>	<u>1,594,773</u>	<u>1,437,586</u>							
Net OPEB Liability	\$1,627,266	\$1,518,735	\$1,504,840							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	52.00%	51.22%	48.86%							
Covered payroll	\$19,633,771	\$19,044,361	\$18,473,085							
Net OPEB Liability as a percentage of covered payroll	8.29%	7.97%	8.15%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – STATE EMPLOYEES
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$1,032,094	\$1,008,184	\$990,028							
Plan Fiduciary Net Position	<u>109,023</u>	<u>95,908</u>	<u>79,516</u>							
Net OPEB Liability	\$923,071	\$912,276	\$910,512							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	10.56%	9.51%	8.03%							
Covered payroll	\$6,844,807	\$6,762,917	\$6,489,070							
Net OPEB Liability as a percentage of covered payroll	13.49%	13.49%	14.03%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – TEACHERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$1,438,114	\$1,381,313	\$1,364,702							
Plan Fiduciary Net Position	<u>129,016</u>	<u>111,639</u>	<u>96,091</u>							
Net OPEB Liability	\$1,309,098	\$1,269,674	\$1,268,611							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	8.97%	8.08%	7.04%							
Covered payroll	\$8,387,684	\$8,087,389	\$7,892,011							
Net OPEB Liability as a percentage of covered payroll	15.61%	15.70%	16.07%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – PARTICIPATING LOCAL SUBDIVISIONS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$42,677	\$40,360	\$39,124							
Plan Fiduciary Net Position	<u>24,468</u>	<u>23,170</u>	<u>22,156</u>							
Net OPEB Liability	\$18,209	\$17,190	\$16,968							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	57.33%	57.41%	56.63%							
Covered payroll	\$1,081,702	\$1,022,007	\$966,611							
Net OPEB Liability as a percentage of covered payroll	1.68%	1.68%	1.76%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – CONSTITUTIONAL OFFICERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$31,356	\$29,629	\$28,193							
Plan Fiduciary Net Position	<u>4,479</u>	<u>3,278</u>	<u>2,427</u>							
Net OPEB Liability	\$26,877	\$26,351	\$25,766							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	14.28%	11.06%	8.61%							
Covered payroll	\$682,376	\$655,995	\$633,397							
Net OPEB Liability as a percentage of covered payroll	3.94%	4.02%	4.07%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – SOCIAL SERVICE EMPLOYEES
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$14,730	\$14,222	\$13,816							
Plan Fiduciary Net Position	<u>2,273</u>	<u>1,319</u>	<u>1,091</u>							
Net OPEB Liability	\$12,457	\$12,903	\$12,725							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	15.43%	9.27%	7.90%							
Covered payroll	\$279,503	\$263,298	\$251,084							
Net OPEB Liability as a percentage of covered payroll	4.46%	4.90%	5.07%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
HEALTH INSURANCE CREDIT PROGRAM – REGISTRARS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$590	\$557	\$520							
Plan Fiduciary Net Position	<u>87</u>	<u>58</u>	<u>34</u>							
Net OPEB Liability	\$503	\$499	\$486							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	14.75%	10.41%	6.54%							
Covered payroll	\$11,770	\$11,512	\$11,047							
Net OPEB Liability as a percentage of covered payroll	4.27%	4.33%	4.40%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
VIRGINIA SICKNESS AND DISABILITY PROGRAM
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$292,046	\$237,733	\$237,013							
Plan Fiduciary Net Position	<u>488,241</u>	<u>462,961</u>	<u>442,334</u>							
Net OPEB Liability	(\$196,195)	(\$225,228)	(\$205,321)							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	167.18%	194.74%	186.63%							
Covered payroll	\$4,077,627	\$3,972,637	\$3,799,590							
Net OPEB Liability as a percentage of covered payroll	-4.81%	-5.67%	-5.40%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
VIRGINIA LOCAL DISABILITY PROGRAM – TEACHERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$2,241	\$1,401	\$873							
Plan Fiduciary Net Position	<u>1,661</u>	<u>647</u>	<u>279</u>							
Net OPEB Liability	\$580	\$754	\$594							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	74.12%	46.18%	31.96%							
Covered payroll	\$479,535	\$372,869	\$282,200							
Net OPEB Liability as a percentage of covered payroll	0.12%	0.20%	0.21%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$3,989	\$1,588	\$914							
Plan Fiduciary Net Position	<u>1,962</u>	<u>816</u>	<u>351</u>							
Net OPEB Liability	\$2,027	\$772	\$563							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	49.19%	51.39%	38.40%							
Covered payroll	\$309,020	\$242,807	\$183,629							
Net OPEB Liability as a percentage of covered payroll	0.66%	0.32%	0.31%							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit B (continued)
GASB 74 Paragraph 36.b.
SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
LINE OF DUTY ACT
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	\$361,626	\$315,395	\$266,252							
Plan Fiduciary Net Position	<u>2,839</u>	<u>1,889</u>	<u>3,461</u>							
Net OPEB Liability	\$358,787	\$313,506	\$262,791							
Ratio of Plan Fiduciary Net Position to Total OPEB Liability	0.79%	0.60%	1.30%							
Covered payroll	n/a	n/a	n/a							
Net OPEB Liability as a percentage of covered payroll	n/a	n/a	n/a							

Note: Schedule is intended to show 10-year trend. Additional years will be reported as they become available.



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
GROUP LIFE INSURANCE PROGRAM
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$102,096	\$99,031	\$241,997	\$237,558	\$231,283	\$228,086	\$221,622	\$181,527	\$177,378	\$145,228
Actual employer contributions	<u>102,096</u>	<u>99,031</u>	<u>241,997</u>	<u>214,162</u>	<u>208,505</u>	<u>205,623</u>	<u>199,796</u>	<u>47,293</u>	<u>44,744</u>	<u>95,185</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$23,396</u>	<u>\$22,778</u>	<u>\$22,463</u>	<u>\$21,826</u>	<u>\$134,234</u>	<u>\$132,634</u>	<u>\$50,043</u>
Covered payroll	\$19,633,771	\$19,044,361	\$18,473,085	\$17,996,821	\$17,521,463	\$17,279,273	\$16,884,223	\$16,446,009	\$15,980,013	\$16,317,768
Actual contributions as a percentage of covered payroll	0.52%	0.52%	1.31%	1.19%	1.19%	1.19%	1.18%	0.29%	0.28%	0.58%



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
HEALTH INSURANCE CREDIT PROGRAM – STATE EMPLOYEES
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$80,084	\$79,802	\$76,571	\$73,961	\$71,522	\$63,385	\$59,617	\$60,222	\$57,193	\$66,523
Actual employer contributions	<u>80,084</u>	<u>79,802</u>	<u>76,571</u>	<u>66,375</u>	<u>64,186</u>	<u>60,366</u>	<u>56,778</u>	<u>7,686</u>	<u>5,396</u>	<u>43,195</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$7,586</u>	<u>\$7,336</u>	<u>\$3,019</u>	<u>\$2,839</u>	<u>\$52,536</u>	<u>\$51,797</u>	<u>\$23,328</u>
Covered payroll	\$6,844,807	\$6,762,917	\$6,489,070	\$6,321,454	\$6,112,950	\$6,036,628	\$5,677,848	\$5,681,295	\$5,395,597	\$5,452,716
Actual contributions as a percentage of covered payroll	1.17%	1.18%	1.18%	1.05%	1.05%	1.00%	1.00%	0.14%	0.10%	0.79%



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
HEALTH INSURANCE CREDIT PROGRAM – TEACHERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$100,652	\$99,475	\$97,072	\$89,976	\$87,739	\$85,571	\$83,763	\$75,999	\$74,522	\$79,407
Actual employer contributions	<u>100,652</u>	<u>99,475</u>	<u>87,601</u>	<u>80,826</u>	<u>78,817</u>	<u>81,183</u>	<u>79,468</u>	<u>42,222</u>	<u>41,401</u>	<u>53,135</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$9,471</u>	<u>\$9,150</u>	<u>\$8,922</u>	<u>\$4,388</u>	<u>\$4,295</u>	<u>\$33,777</u>	<u>\$33,121</u>	<u>\$26,272</u>
Covered payroll	\$8,387,684	\$8,087,389	\$7,892,011	\$7,625,071	\$7,435,548	\$7,313,792	\$7,159,267	\$7,036,940	\$6,900,183	\$7,089,930
Actual contributions as a percentage of covered payroll	1.20%	1.23%	1.11%	1.06%	1.06%	1.11%	1.11%	0.60%	0.60%	0.75%



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
HEALTH INSURANCE CREDIT PROGRAM – PARTICIPATING LOCAL SUBDIVISIONS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$2,353	\$2,208	\$2,088	\$1,923	\$1,859	\$1,875	\$2,035	\$1,974	\$1,940	\$3,026
Actual employer contributions	<u>2,353</u>	<u>2,208</u>	<u>2,088</u>	<u>1,923</u>	<u>1,859</u>	<u>1,875</u>	<u>2,035</u>	<u>1,974</u>	<u>1,940</u>	<u>3,026</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
Covered payroll	\$1,081,702	\$1,022,007	\$966,611	\$921,923	\$886,366	\$859,540	\$1,019,421	\$980,836	\$965,450	\$971,042
Actual contributions as a percentage of covered payroll	0.22%	0.22%	0.22%	0.21%	0.21%	0.22%	0.20%	0.20%	0.20%	0.31%



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
HEALTH INSURANCE CREDIT PROGRAM – CONSTITUTIONAL OFFICERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$2,593	\$2,362	\$2,280	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actual employer contributions	<u>2,593</u>	<u>2,362</u>	<u>2,280</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Covered payroll	\$682,376	\$655,995	\$633,397	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actual contributions as a percentage of covered payroll	0.38%	0.36%	0.36%	n/a	n/a	n/a	n/a	n/a	n/a	n/a



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
HEALTH INSURANCE CREDIT PROGRAM – SOCIAL SERVICE EMPLOYEES
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$1,202	\$1,106	\$1,055	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actual employer contributions	<u>1,202</u>	<u>1,106</u>	<u>1,055</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Covered payroll	\$279,503	\$263,298	\$251,084	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actual contributions as a percentage of covered payroll	0.43%	0.42%	0.42%	n/a	n/a	n/a	n/a	n/a	n/a	n/a



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
HEALTH INSURANCE CREDIT PROGRAM – REGISTRARS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$46	\$47	\$45	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actual employer contributions	<u>46</u>	<u>47</u>	<u>45</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Covered payroll	\$11,770	\$11,512	\$11,047	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actual contributions as a percentage of covered payroll	0.39%	0.41%	0.41%	n/a	n/a	n/a	n/a	n/a	n/a	n/a



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
VIRGINIA SICKNESS AND DISABILITY PROGRAM
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$25,281	\$26,219	\$25,077	\$27,187	\$26,244	\$20,610	\$21,032	\$30,285	\$28,646	\$76,530
Actual employer contributions	<u>25,281</u>	<u>26,219</u>	<u>25,077</u>	<u>24,580</u>	<u>23,728</u>	<u>16,701</u>	<u>17,043</u>	<u>1,096</u>	<u>0</u>	<u>30,861</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$2,607</u>	<u>\$2,516</u>	<u>\$3,909</u>	<u>\$3,989</u>	<u>\$29,189</u>	<u>\$28,646</u>	<u>\$45,669</u>
Covered payroll	\$4,077,627	\$3,972,637	\$3,799,590	\$3,724,248	\$3,595,080	\$3,553,444	\$3,626,208	\$4,037,955	\$3,819,462	\$3,904,606
Actual contributions as a percentage of covered payroll	0.62%	0.66%	0.66%	0.66%	0.66%	0.47%	0.47%	0.03%	0.00%	0.79%



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
VIRGINIA LOCAL DISABILITY PROGRAM - TEACHERS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$1,966	\$1,156	\$875	\$536	\$276	\$10	n/a	n/a	n/a	n/a
Actual employer contributions	<u>1,966</u>	<u>1,156</u>	<u>875</u>	<u>536</u>	<u>276</u>	<u>10</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Covered payroll	\$479,535	\$372,869	\$282,200	\$184,729	\$95,328	\$3,549	n/a	n/a	n/a	n/a
Actual contributions as a percentage of covered payroll	0.41%	0.31%	0.31%	0.29%	0.29%	0.28%	n/a	n/a	n/a	n/a



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
VIRGINIA LOCAL DISABILITY PROGRAM – POLITICAL SUBDIVISIONS
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$2,225	\$1,457	\$1,102	\$741	\$377	\$41	n/a	n/a	n/a	n/a
Actual employer contributions	<u>2,225</u>	<u>1,457</u>	<u>1,102</u>	<u>741</u>	<u>377</u>	<u>41</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Annual contribution deficiency (excess)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Covered payroll	\$309,020	\$242,807	\$183,629	\$123,509	\$62,801	\$6,818	n/a	n/a	n/a	n/a
Actual contributions as a percentage of covered payroll	0.72%	0.60%	0.60%	0.60%	0.60%	0.60%	n/a	n/a	n/a	n/a



Appendix A – Required Supplementary Information Tables (continued)

Exhibit C (continued)
GASB 74 Paragraph 36.c.
SCHEDULE OF EMPLOYER CONTRIBUTIONS
LINE OF DUTY ACT
(\$ in Thousands)

Year Ending June 30	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined employer contribution	\$24,176	\$23,214	\$23,503	\$23,328	\$23,847	\$22,103	\$21,895	\$25,033	n/a	n/a
Actual employer contributions	<u>13,421</u>	<u>10,652</u>	<u>10,785</u>	<u>9,756</u>	<u>9,974</u>	<u>10,381</u>	<u>9,341</u>	<u>8,323</u>	<u>n/a</u>	<u>n/a</u>
Annual contribution deficiency (excess)	<u>\$10,755</u>	<u>\$12,562</u>	<u>\$12,718</u>	<u>\$13,572</u>	<u>\$13,873</u>	<u>\$11,722</u>	<u>\$12,554</u>	<u>\$16,710</u>	<u>n/a</u>	<u>n/a</u>
Covered payroll	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actual contributions as a percentage of covered payroll	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a



Appendix B – Summary of Main Benefit Provisions

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.



Appendix B – Summary of Main Benefit Provisions (continued)

GROUP LIFE INSURANCE PROGRAM

The Group Life Insurance Program is administered by the Board of Trustees for the Virginia Retirement System (VRS). Contributions received are held in trust. Premiums for active employees are paid to Minnesota Life which in turn pays the life insurance proceeds to the beneficiaries. Payments for postemployment benefits are made by Minnesota Life and reimbursed by the Trust. The Board sets administrative policy and determines the allocation of the assets held for investment.

The following persons are eligible to participate in the Group Life Insurance Program: Teachers, State Employees, State Police (SPORS), Judicial Employees (JRS), Virginia Law Officers (VaLORS) and those VRS members receiving long-term disability benefits from the Virginia Sickness and Disability Program (VSDP), the Virginia Local Disability Program (VLDP), or, if the employer opted-out of VLDP during the election period, a comparable plan. In addition, local political subdivisions may elect coverage. Substantially all local units covered by VRS have elected coverage in the Group Life Insurance Program, as have other political subdivisions not providing VRS pension benefits. Also, certain members of the Optional Retirement Plan (ORP) have life insurance coverage. Although certain members who were employed at the time of initial coverage under the Group Life Insurance Program may decline coverage, substantially all full-time, permanent employees participate.

Each active member is entitled to a death benefit from this plan equal to two times the member's annual rate of compensation, rounded up to the next higher multiple of \$1,000. This benefit is provided for by the purchase of a group term life insurance contract from an insurance company. Active members may also be covered by Accidental Death and Dismemberment insurance, and they may elect additional amounts of insurance. These benefits are excluded from this valuation.

Each service retiree will be entitled to a death benefit from this plan equal to the amount in effect immediately before his/her termination or retirement, reduced by 25% on January 1 of the first full year following the date the employee is separated from service and each year thereafter. In no event will the death benefit be less than 25% of the amount in effect at the date of termination or retirement or \$8,000 for members who retire with at least 30 years of creditable service (the \$8,000 is increased by the same percentage as any annual post-retirement supplement for retirees, as calculated for employees hired on or after July 1, 2010).

Each disabled member, including those receiving benefits from VSDP or VLDP, will be entitled to a death benefit from this plan, similar to the service retiree benefit, except the 25% per year reduction does not begin until the member reaches Normal Retirement Age, or the retirement date, if later. Members participating in VLDP (or a comparable plan) and State, VaLORS, and SPORS members participating in VSDP and hired on or after July 1, 2009 need at least one year of service before the member is eligible for a non-service related life insurance benefit from the Plan. The postemployment death benefit is paid for by an addition to the contribution required to provide the



Appendix B – Summary of Main Benefit Provisions (continued)

active member benefit. While the active member portion of the contribution is used to purchase group term life insurance from an insurance company, the postemployment portion of the contribution is held in a trust until required to pay benefits. The postemployment contribution is actuarially determined by this valuation.

HEALTH INSURANCE CREDIT PROGRAM

If an eligible employee has worked for more than one employer in VRS, for the purpose of this valuation, their most current (or last) employer providing HIC benefits assumes full liability for that employee.

STATE EMPLOYEES (State, SPORS, JRS, VaLORS, ORP, and UVA)

The Commonwealth shall provide a credit toward the cost of health insurance coverage for any former state employee who retired under the Virginia Retirement System (State), State Police Officers' Retirement System (SPORS), Judicial Retirement System (JRS), or Virginia Law Officers' Retirement System (VaLORS) and who rendered at least 15 years of total creditable service under the Retirement System or rendered service as a temporary employee of the General Assembly in 1972 and became a member of the retirement system from 1972 to 1985 immediately following such temporary service. The amount of each monthly health insurance credit shall be \$4 per year of creditable service, which shall be credited monthly to any retired employee participating in the Health Insurance Credit Program. However, such credit shall not exceed a beneficiary's qualified medical expenses.

An employee who retired under an Optional Retirement Plan (ORP) or the University of Virginia (UVA) may qualify for the health insurance credit if the retiree has at least 15 years of coverage under the ORP, UVA, or a combination of VRS service credit and ORP or UVA coverage equal to at least 15 years.

Disabled State retirees and Virginia Sickness and Disability Program (VSDP) beneficiaries shall receive a maximum monthly credit, which is the greater of (i) \$120, (ii) \$4 per year for each year of creditable service at the time of disability retirement, or (iii) \$4 per year for each year of creditable service at the time of eligibility for postemployment disability benefits. State, VaLORS, and SPORS employees participating in VSDP who receive long-term disability benefits from VSDP shall receive a monthly credit of \$120, or \$4 per year of creditable service at the time of disability, whichever is greater. Those employees participating in VSDP and hired on or after July 1, 2009 are required to earn one year of service to be eligible for the non-service related Health Insurance Credit disability benefit.



Appendix B – Summary of Main Benefit Provisions (continued)

TEACHERS

A member who retired under the Virginia Retirement System and who rendered at least 15 years of total creditable service under VRS shall receive a health insurance credit to his monthly retirement allowance, which shall be applied to reduce the retired member's health insurance premium cost. The amount of each monthly health insurance credit shall be \$4 for each full year of the retired member's creditable service. However, such credit shall not exceed a beneficiary's qualified medical expenses.

Disabled Teacher retirees and Virginia Local Disability Program (VLDP) beneficiaries (or, if the employer opted-out of VLDP during the election period, a comparable plan) shall receive a monthly health insurance credit of \$4 multiplied by the lesser of (i) twice the amount of his creditable service or (ii) the amount of creditable service he would have completed at age 60 if he had remained in service to that age. Eligibility for the credit shall be determined in a manner prescribed by the Virginia Retirement System. Those employees participating in VLDP (or, if the employer opted-out of VLDP during the election period, a comparable plan) and hired on or after July 1, 2009 are required to earn one year of service to be eligible for the non-service related Health Insurance Credit disability benefit.

POLITICAL SUBDIVISIONS

Political subdivisions participating in the Virginia Retirement System (VRS) may elect to provide a credit toward the cost of health insurance coverage for any former employee who retired under VRS with at least 15 years of total creditable service. The amount of each monthly health insurance credit shall be \$1.50 per year of creditable service, which amount shall be paid monthly to any retired employee participating in the Health Insurance Credit Program. However, such credit shall not exceed the health insurance premium for retiree.

Disabled retirees are eligible to receive a maximum monthly credit of \$45.

In addition to the above mentioned health insurance credit, this locality has chosen to provide an additional health insurance credit of \$1 per month for each full year of the retired member's creditable service, not to exceed a maximum monthly credit of \$30. This additional benefit is available for retired constitutional officers, employees of constitutional officers, general registrars, employees of general registrars, and local social service employees.



Appendix B – Summary of Main Benefit Provisions (continued)

SPECIAL COVERGE GROUPS

A local officer, as defined in the Code of Virginia §51.1-124.3, retired under the Virginia Retirement System (VRS) who rendered at least 15 years of total creditable service under VRS shall receive a monthly health insurance credit of \$1.50 per year of creditable service, not to exceed a maximum monthly credit of \$45. However, such credit shall not exceed the health insurance premium for the retiree.

Disabled retirees are eligible to receive a maximum monthly credit of \$45.

VIRGINIA SICKNESS AND DISABILITY PROGRAM

The following employees are eligible for VSDP benefits: full-time and part-time salaried state employees who are active members of the Virginia Retirement System (State), active members of the State Police Officers' Retirement System (SPORS), and active members of the Virginia Law Officers' Retirement System (VaLORS). Newly hired or appointed faculty of state universities of higher education in teaching, research or administrative positions who elect VRS as their retirement plan, may elect coverage under VSDP or any disability plan offered by the institution. If the institution does not offer an alternative disability plan, the faculty member is automatically covered under VSDP. Any eligible employee hired on or after July 1, 2009, shall not be eligible to receive VSDP long-term disability (LTD) benefits for non-work related disabilities prior to the completion of one continuous year of employment.

LTD benefits provide income replacement for members who become disabled and are unable to work for an extended period of time. LTD benefits begin at the expiration of the maximum period of short-term disability. While on long-term disability, members continue to accrue service as a VRS-covered member. LTD recipients are not considered employees of the Commonwealth of Virginia while they are on long-term disability.

Upon attaining the normal retirement age while on LTD, a member is required to retire. However, if the member becomes disabled within five years of the normal retirement age, they will be eligible, for up to five years, to receive VSDP LTD benefits, provided the member remains medically eligible. Once such member receives VSDP LTD benefits for five years, the member must retire.

Members are eligible to receive LTD benefits while working. Long-term disability-working status is in effect if members are able to work at least 20 hours a week, but are restricted from performing the full duties of their job or working a regular schedule. A member must have returned to work with modified duties while on short-term disability to be eligible for long-term disability-working status. The benefit will be adjusted by income or wages a member earns. During the first six months of long-term disability-working, the benefit amount will be adjusted by 60 percent of income or wages earned from employment. After the first six months of long-term disability-working, the benefit amount will be adjusted by 70 percent of income or wages earned from employment.



Appendix B – Summary of Main Benefit Provisions (continued)

LTD benefits provide members with an income replacement of 60 percent of a member's pre-disability income, or 80 percent for a catastrophic condition. For valuation purposes, a 2.50% Cost of Living Adjustment (COLA) is assumed for participating Plan 1 members of State, SPORS and VaLORS. For participating Plan 2 and Hybrid Plan members of State, SPORS, and VaLORS, a 2.25% COLA is assumed for the purpose of this valuation. LTD recipients are also eligible for benefits under the Health Insurance Credit Program (HIC) and are eligible for benefits under the Group Life Insurance Program (GLI). The liability associated with HIC and GLI for LTD recipients is not included as a VSDP liability, and is valued under the actuarial valuation of the HIC and GLI plans.

The LTD benefit is adjusted by any payments received as a result of the same disability from wages and salary from employment. Wages and salary include income reported on W-2 forms and income from self-employment. During the first six months on long-term disability, the amount of the adjustment depends on the income replacement level under VSDP.

LTD benefits end if the member: is able to perform the full duties of their job without restrictions, leaves covered employment and takes a refund of their member contributions and interest in their member contribution account, applies for service retirement or reaches normal retirement age, or the member does not cooperate or comply with the requirements of VSDP.

The purpose of the long-term care (LTC) benefit under VSDP is to provide members financial assistance towards long-term care services needed as a result of a catastrophic illness, injury or aging. Specifically, the LTC benefit under VSDP provides a \$96 per day indemnity benefit to reimburse qualified nursing home and assisted living costs. Additional LTC benefits are provided for qualified home health care services (50% of the nursing home daily benefit amount), and informal care (25% of the nursing home daily benefit amount). LTC benefits are paid after a 90-day elimination period following a member's certification to be unable to perform two of six activities of daily living or having a severe cognitive impairment. LTC benefits are tax qualified under the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

The LTC benefit has a lifetime maximum benefit of \$70,080 based upon a two-year maximum coverage period with a \$96 daily benefit amount (DBA) paid for nursing home care. At VRS' discretion, the DBA may be increased for inflation every five years in the amount of 5%, compounded annually since the previous increase. Since the LTC benefit's inception, VRS has elected to increase the DBA once (December of 2007). As such, the valuation does not include a provision for increases to the DBA. If the LTC benefit policy is to provide increases at regular intervals, the resulting liability will be materially greater than the results presented (i.e., inflation increases are not assumed to be pre-funded).

While actively employed or receiving LTD benefits, a member receives coverage in the amount currently in place for the actively employed group. Upon termination of employment, a member has the option to port the amount of coverage current for the actively employed group by paying a premium based upon the member's age at entry into VSDP.



Appendix B – Summary of Main Benefit Provisions (continued)

VIRGINIA LOCAL DISABILITY PROGRAM

The VLDP provides disability benefits for those Hybrid Plan members of Teachers and Political Subdivisions (excluding members with enhanced hazardous duty coverage) that elect to participate in VLDP.

Long-term disability (LTD) benefits provide income replacement for members who become disabled and are unable to work for an extended period of time. LTD benefits begin at the expiration of the maximum period of short-term disability. While on long-term disability, members continue to accrue service as a VRS-covered member. LTD recipients are not considered employees of their associated employer group while they are on long-term disability.

In addition an income replacement benefit, disabled members participating in the Hybrid Plan may be eligible to receive a one percent employer contribution to their defined contribution account. To be eligible for the one percent mandatory employer contribution, a Hybrid Plan member must be permanently and totally disabled as defined in §22(e)(3) of the Internal Revenue Code (Social Security Definition of Disability).

Upon attaining the normal retirement age while on LTD, a member is required to retire. However, if the member becomes approved for supplemental disability benefits on or after age 60 they will be eligible to receive VLDP LTD benefits, provided the member remains medically eligible, based on the chart below:

Ages Approved for Supplemental Disability Benefits	Supplemental Disability Benefit Eligibility Period*
60 – 64	5 Years
65 – 68	To Age 70
69 and Older	1 Year

*Eligibility period includes short-term disability and long-term disability

Members are eligible to receive LTD benefits while working. Long-term disability-working status is in effect if members are able to work at least 20 hours a week, but are restricted from performing the full duties of their job or working a regular schedule. A member must have returned to work with modified duties while on short-term disability to be eligible for long-term disability-working status. The benefit will be adjusted by income or wages a member earns. During the first six months of long-term disability-working, the benefit amount will be adjusted by 60 percent of income or wages earned from employment. After the first six months of long-term disability-working, the benefit amount will be adjusted by 70 percent of income or wages earned from employment.



Appendix B – Summary of Main Benefit Provisions (continued)

LTD benefits provide members with an income replacement of 60 percent of a member's pre-disability income, or 80 percent for a catastrophic condition. LTD recipients are also eligible for benefits under the Health Insurance Credit Program (HIC) and are eligible for benefits under the Group Life Insurance Program (GLI). The liability associated with HIC and GLI for LTD recipients is not included as a VLDP liability, and is valued under the actuarial valuation of the HIC and GLI plans.

The LTD benefit is adjusted by any payments received as a result of the same disability from wages and salary from employment. Wages and salary include income reported on W-2 forms and income from self-employment. During the first six months on long-term disability, the amount of the adjustment depends on the income replacement level under VLDP.

LTD benefits end if the member: is able to perform the full duties of their job without restrictions, leaves covered employment and takes a refund of their member contributions and interest in their member contribution account, applies for service retirement or reaches normal retirement age, or the member does not cooperate or comply with the requirements of VLDP.

The purpose of the long-term care (LTC) benefit under VLDP is to provide members financial assistance towards long-term care services needed as a result of a catastrophic illness, injury or aging. Specifically, the LTC benefit under VLDP provides a \$96 per day indemnity benefit to reimburse qualified nursing home and assisted living costs. Additional LTC benefits are provided for qualified home health care services (50% of the nursing home daily benefit amount), and informal care (25% of the nursing home daily benefit amount). LTC benefits are paid after a 90-day elimination period following a member's certification to be unable to perform two of six activities of daily living or having a severe cognitive impairment. LTC benefits are tax qualified under the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

The LTC benefit has a lifetime maximum benefit of \$70,080 based upon a two-year maximum coverage period with a \$96 daily benefit amount (DBA) paid for nursing home care. At VRS' discretion, the DBA may be increased for inflation every five years in the amount of 5%, compounded annually since the previous increase. Since the LTC benefit's inception, VRS has elected to increase the DBA once (December of 2007). As such, the valuation does not include a provision for increases to the DBA. If the LTC benefit policy is to provide increases at regular intervals, the resulting liability will be materially greater than the results presented (i.e., inflation increases are not assumed to be pre-funded).

While actively employed or receiving LTD benefits, a member receives coverage in the amount currently in place for the actively employed group. Upon termination of employment, a member has the option to port the amount of coverage current for the actively employed group by paying a premium based upon the member's age at entry into VLDP.



Appendix B – Summary of Main Benefit Provisions (continued)

LINE OF DUTY ACT

Participating Employers

Any employer that is a state agency (i.e., employs a State Employee) participates in the Plan. Participating political subdivision employer groups with participants in the LODA Program were required to make an irrevocable election to participate in the Plan on or before July 1, 2012. Political subdivision employer groups who elected to opt-out of the Plan and self-fund LODA Program benefits assume responsibility for all benefit payments made after the election. This includes amounts paid to current beneficiaries for whom the political subdivision employer group is the employer of record.

Eligibility

Hazardous duty state and local government employees of the following groups, including volunteers, are eligible for the LODA Program benefits.

- Law-enforcement officers of the Commonwealth or any of its political subdivisions
- Correctional officers
- Jail officers
- Regional jail or jail farm superintendents
- Sheriff, deputy sheriff, city sergeant, or deputy city sergeant of the City of Richmond
- Police chaplains
- Members of fire companies or departments or rescue squads recognized by any county, city, or town of the Commonwealth as an integral part of an official safety program
- Virginia National Guard or the Virginia State Defense Force members, including fire companies or departments providing their fire protection services
- Special agents of the Virginia Alcoholic Beverage Control Board
- Full-time sworn members of the enforcement division of the Department of Motor Vehicles
- Conservation officers of the Department of Conservation and Recreation.
- Commissioned forest wardens
- Members or employees of the Virginia Marine Resources Commission granted the power of arrest
- Department of Emergency Management hazardous materials officers
- Other employees of the Department of Emergency Management if performing duties related to a major disaster or emergency
- Employees of any county, city, or town performing official emergency management or emergency services duties in cooperation with the Department of Emergency Management
- Non-firefighter regional hazardous materials emergency response team members



Appendix B – Summary of Main Benefit Provisions (continued)

Some of those covered by the Plan may not be able to be identified in a census (e.g., volunteers) or, if they can be specifically identified, may not have a level of exposure that is on par with other participants (e.g., those serving in a major disaster or emergency versus a full-time firefighter). Experience, if and when available, would be the best method to determine the appropriate "load" to the seriatim liability. The results presented assume no additional margin for unidentifiable employees.

The results provided do not account for the potential, long-term incurred but not reported claims resulting from a lack of employer or beneficiary education about the Plan's benefits. The potential cost and liability for these claims may be considerable. A margin for these costs may need to be considered as experience develops. Additionally, the LODA Program administrator may want to consider this potential risk in regards to its authority to waive the five-year statute of limitation on claims.

The results presented were determined based upon the demographic assumptions (e.g., mortality, disability, retirement, termination) of state employee and law enforcement/fire personnel covered by VRS, and, as such, may not reflect the experience of all participants. If credible experience materializes, the Plan may want to consider developing rates based upon segmented risk pools or other divisions.

Death Benefit

A \$100,000 death benefit payment for death occurring as a direct or proximate result of the performance of duty, or a \$25,000 death benefit payment for death by presumptive clause or within five years of retirement. In determining the average death benefit payment, the LODA Program's experience was used to develop an average benefit payment assumption, reflecting the benefit's varying amount based upon the cause of death, and applied to a percentage of active mortality. Presumptive death benefit payments require additional investigation to determine employee status at the time of death.

Health Care Coverage Period

For disabilities and deaths occurring prior to July 1, 2017 that result in health care coverage under the Plan, disabled employees, their spouses, and surviving spouses receive lifetime health care benefits. For disabilities and deaths occurring after June 30, 2017 that result in health care coverage under the Plan, disabled employees (except those eligible for Medicare due to disability under Social Security Disability Insurance or a Railroad Retirement Board Disability Annuity), their spouses, and surviving spouses receive health care benefits until becoming eligible for Medicare due to age (age 65). Disabled employees eligible for Medicare due to disability under Social Security Disability Insurance or a Railroad Retirement Board Disability Annuity receive lifetime health care benefits.



Appendix B – Summary of Main Benefit Provisions (continued)

Health Care Benefit (Effective until July 1, 2017)

The health care benefit is defined as “the same plan of benefits which the deceased or disabled person was entitled to on the last day of his active duty or comparable benefits established as a result of a replacement plan.” The level of coverage offered by various employer groups may be wide-ranging due to the types of coverage provided (e.g., HMO, PPO, dental, vision, individual policies, Medicare Part B premium reimbursement), level of coverage provided (e.g., benefit maximums, Medicare coverage type), and cost-sharing provisions (e.g., premiums, deductibles, copays, out-of-pocket maximums, Medicare coordination of benefits methodology). As a result, the true cost of coverage will vary by health care plan. This may result in a selective advantage for those employer groups providing health care coverage that is richer than the average used to determine the Plan’s costs.

In determining initial per capita costs for the Plan, the use of a uniform health care cost assumption based upon the Plan’s recent experience was used. As noted above, the use of a uniform health care cost structure may result in selection by employer groups with costs differing greatly from the standard. This selection process may result in higher than expected plan costs. Those payments identified as “self-pay” need to be investigated to determine if the coverage is from a former employer, is from a community rated policy, or is from an individually underwritten policy to determine if these costs need to be age adjusted. The results presented assume 20% of under age 65 health care costs and 40% of health care costs for beneficiaries ages 65 and older are age-adjusted beyond the assumed cost change upon reaching age 65.

Health Care Benefit (Effective July 1, 2017)

The health care benefit for the LODA Program is to be provided through the LODA Health Benefits Plans, administered by the Department of Human Resource Management and modeled upon the state employee health benefits program plans (COVA Care). As the cost of the LODA Health Benefits Plans is to be pooled across all beneficiaries of the LODA Program, the cost to the Plan may be higher or lower than the actual health care costs incurred by the Plan’s health care beneficiaries.

Per capita costs were based upon the adjusted experience of those State Employees currently receiving health care benefits from the Plan using high-level assumptions and estimates that are likely to change as details regarding the LODA Health Benefit Plans emerge. This includes the demographic adjustments made for the Plan’s covered population, the mix of health care plan and coverage elections made by State Employees, and the level of benefits to be provided. As such, future experience may differ significantly from the cost estimates presented in this report, and the valuation’s results should be viewed as having a likely range of variability.

Beyond the first projection year, all assumed health care costs not related to covered dependent children were age-adjusted to reflect the full, age-specific cost of providing benefits.



Appendix B – Summary of Main Benefit Provisions (continued)

Cost Offsets

To the extent the Plan's benefits are paid or reimbursed by other programs such as the VRS Health Insurance Credit Program (HIC), or applicable retirement plans, benefit offsets should be considered in developing the Plan's rate structure. The results provided include estimated HIC receipts and assume the estimated reimbursements from the HIC program are used to decrease costs for all Plan participants.

Affordable Care Act

The impact of the Affordable Care Act (ACA) was addressed in this valuation. While the impact of certain provisions such as the excise tax on high-value health insurance plans beginning in 2020 (if applicable), should be recognized in the determination of liabilities, overall future plan costs and the resulting liabilities are driven by amounts employers and retirees can afford (i.e., trend). Given the uncertainty regarding the ACA's implementation, continued monitoring of the ACA's impact on the Plan's liability will be required.

Changes associated with HB 1345 (2016) and HB 2243 (2017)

Health care benefits were assumed to be uniform amongst Plan beneficiaries to reflect the changes brought about by the passage of HB 1345 (2016) and HB 2243 (2017). The legislation revised the Line of Duty Act by transferring overall administration of eligibility determinations to VRS and administration of health insurance benefits to the Department of Human Resource Management (DHRM) and creates state-wide health insurance plans for all LODA beneficiaries, with separate plans based on Medicare eligibility. The legislation became effective July 1, 2017 and is included in this valuation. Here, the assumed health care costs were based upon the premium amounts provided by the DHRM actuaries which used experience of those State Employees currently receiving health care benefits from the Plan

Changes associated with HB 1345 (2016) and HB 2243 (2017) that were not considered in the June 30, 2017 valuation include the following. These changes were not considered because they are difficult to quantify with limited experience. These changes will continue to be monitored and will be revisited if and when sufficient experience develops.

- The discontinuance of spouse health care coverage if a covered spouse divorces a disabled employee or a covered surviving spouse remarries.
- The potential for VRS' periodic review of the disability status of a disabled employee.
- For those Plan beneficiaries who become eligible for health care benefits as the result of a disability occurring after June 30, 2017, the suspension of health care benefits in years when VRS verifies current income exceeds salary at the time of the disability, indexed for inflation.

Changes associated with HB 1345 (2016) and HB 2243 (2017) that are included in the plan provisions and assumed to be included in the premium rates as of June 30, 2017 include:

- The extension of health care benefits for dependent children to age 26.
- The expansion of the definition of presumption of death or disability to include infectious diseases.



Appendix B – Summary of Main Benefit Provisions (continued)

STATE EMPLOYEES¹ **Plan Specific Benefit Provisions**

Normal Retirement Eligibility:

Plan 1:	A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.
Plan 2 and Hybrid:	A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

Early Retirement Eligibility:

Plan 1:	A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years of service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.
Plan 2 and Hybrid:	A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

Disability Retirement Eligibility – Non-VSDP:

A Plan 1 member hired prior to January 1, 1999 and who has declined VSDP coverage is eligible for disability retirement benefits from the first day of employment.

Disability Retirement Eligibility – VSDP:

A Plan 1 member hired prior to January 1, 1999 and who has elected VSDP coverage or any member hired on or after January 1, 1999. Applicable members hired prior to July 1, 2009 are eligible from the first day of employment for work related and non-work related VSDP disability benefits. Applicable members hired on or after July 1, 2009 are eligible from the first day of employment for work-related VSDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VSDP disability benefits.

¹ The actuarial assumptions for State are also applied to the applicable members of the Optional Retirement Plan (ORP).



Appendix B – Summary of Main Benefit Provisions (continued)

TEACHERS² **Plan Specific Benefit Provisions**

Normal Retirement Eligibility:

Plan 1:	A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.
Plan 2 and Hybrid:	A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

Early Retirement Eligibility:

Plan 1:	A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years of service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.
Plan 2 and Hybrid:	A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

Disability Retirement Eligibility

- **Non-VLDP (Plan 1 and Plan 2):** A member is eligible from the first day of employment.

Disability Retirement Eligibility

- **VLDP (Hybrid Plan):** Hybrid Plan members are eligible from the first day of employment for work-related VLDP disability benefits (or, if the employer opted-out of VLDP during the election period, a comparable plan), but must have a minimum of one year of service to be eligible for non-work related VLDP disability benefits.

² The actuarial assumptions for Teachers are also applied to the applicable members of the Optional Retirement Plan (ORP).



Appendix B – Summary of Main Benefit Provisions (continued)

STATE POLICE Plan Specific Benefit Provisions

Normal Retirement Eligibility:	A member may retire with an unreduced pension benefit upon Normal Retirement on or after age 60 with credit for five years of service.
Early Retirement Eligibility:	A member may retire early with unreduced pension benefits after reaching age 50 with at least 25 years of service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least five years of service credit.
Disability Retirement Eligibility – Non-VSDP:	A member hired prior to 1/1/1999 and who has declined VSDP coverage is eligible for disability benefits from the first day of employment.
Disability Retirement Eligibility – VSDP:	A Plan 1 member hired prior to January 1, 1999 and who has elected VSDP coverage or any member hired on or after January 1, 1999. Applicable members hired prior to July 1, 2009 are eligible from the first day of employment for work related and non-work related VSDP disability benefits. Applicable members hired on or after July 1, 2009 are eligible from the first day of employment for work-related VSDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VSDP disability benefits.



Appendix B – Summary of Main Benefit Provisions (continued)

JUDICIAL Plan Specific Benefit Provisions

Service:

- Plan 1: Employees receive credit of one year of service multiplied by a weighting factor of 3.5 (2.5 for judges entering JRS on or after January 1, 1995). Any non-judicial VRS service credit is not weighted.
- Plan 2 and Hybrid: Employees receive credit of one year of service multiplied by a weighting factor of:
- 1.5 for judges entering JRS before age 45,
 - 2.0 for judges entering JRS between ages 45 and 54, or
 - 2.5 for judges entering JRS at age 55 or older.

Any non-judicial VRS service credit is not weighted.

Normal Retirement Eligibility:

A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service, or age 60 with at least 30 years of service credit. Effective June 1, 2017, the mandatory retirement age for judges is age 73.

Early Retirement Eligibility:

A member may retire early with unreduced pension benefits at age 60 with at least 30 years of service or a member may retire early with reduced pension benefits after reaching age 55 with at least five years of service credit.

Disability Retirement Eligibility – (Plan 1 and Plan 2):

A member is eligible from the first day of employment.

Disability Retirement Eligibility – VLDP (Hybrid Plan):

Hybrid Plan members are eligible from the first day of employment for work-related disability benefits, but must have a minimum of one year of service to be eligible for non-work related disability benefits.



Appendix B – Summary of Main Benefit Provisions (continued)

VIRGINIA LAW OFFICERS Plan Specific Benefit Provisions

- Normal Retirement Eligibility:** A member may retire upon Normal Retirement on or after age 60 with credit for five years of service.
- Early Retirement Eligibility:** A member may retire early with unreduced pension benefits after reaching age 50 with at least 25 years of service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least five years of service credit.
- Disability Retirement Eligibility:**
– **Non-VSDP:** A member hired prior to 1/1/1999 and who has declined VSDP coverage is eligible for disability retirement benefits from the first day of employment.
- Disability Retirement Eligibility:**
– **VSDP:** A Plan 1 member hired prior to January 1, 1999 and who has elected VSDP coverage or any member hired on or after January 1, 1999. Applicable members hired prior to July 1, 2009 are eligible from the first day of employment for work related and non-work related VSDP disability benefits. Applicable members hired on or after July 1, 2009 are eligible from the first day of employment for work-related VSDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VSDP disability benefits.



Appendix B – Summary of Main Benefit Provisions (continued)

POLITICAL SUBDIVISIONS GROUP A - General Plan Specific Benefit Provisions

Normal Retirement Eligibility:

Plan 1:	A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.
Plan 2 and Hybrid:	A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

Early Retirement Eligibility:

Plan 1:	A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years of service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.
Plan 2 and Hybrid:	A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

Disability Retirement Eligibility – (Plan 1 and Plan 2):

A member is eligible from the first day of employment.

Disability Retirement Eligibility – VLDP (Hybrid Plan):

Hybrid Plan members are eligible from the first day of employment for work-related VLDP disability benefits (or, if the employer opted-out of VLDP during the election period, a comparable plan), but must have a minimum of one year of service to be eligible for non-work related VLDP disability benefits.



Appendix B – Summary of Main Benefit Provisions (continued)

**POLITICAL SUBDIVISIONS
GROUP A – LEO/Fire
Plan Specific Benefit Provisions**

Normal Retirement Eligibility: A member may retire with an unreduced pension benefit upon Normal Retirement on or after age 60 with credit for five years of service.

Early Retirement Eligibility: A member may retire early with unreduced pension benefits after reaching age 50 with at least 25 years of service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least five years of service credit.

Disability Retirement Eligibility: A member is eligible for disability retirement benefits from the first day of employment.



Appendix B – Summary of Main Benefit Provisions (continued)

POLITICAL SUBDIVISIONS GROUP B³ – General Plan Specific Benefit Provisions

Normal Retirement Eligibility:

Plan 1:	A member may retire with unreduced pension benefits upon Normal Retirement on or after age 65 with credit for five years of service.
Plan 2 and Hybrid:	A member may retire with unreduced pension benefits upon Normal Retirement once they attain their normal Social Security retirement age and have at least five years of service.

Early Retirement Eligibility:

Plan 1:	A member may retire early with unreduced pension benefits after reaching age 50 with at least 30 years service credit. A member may retire early with reduced pension benefits after reaching age 50 with at least ten years of service credit, or age 55 with credit for at least five years of service.
Plan 2 and Hybrid:	A member may retire early with unreduced pension benefits upon the sum of their age and their service being 90 (Rule of 90). A member may retire early with reduced pension benefits after reaching age 60 with at least five years of service credit.

Disability Retirement Eligibility – (Plan 1 and Plan 2):

A member is eligible from the first day of employment.

Disability Retirement Eligibility – VLDP (Hybrid Plan):

Hybrid Plan members are eligible from the first day of employment for work-related VLDP disability benefits (or, if the employer opted-out of VLDP during the election period, a comparable plan), but must have a minimum of one year of service to be eligible for non-work related VLDP disability benefits.

³ The actuarial assumptions for Political Subdivisions Group B are also applied to members of the political subdivisions not providing VRS pension benefits.



Appendix B – Summary of Main Benefit Provisions (continued)

**POLITICAL SUBDIVISIONS
GROUP B – LEO/Fire
Plan Specific Benefit Provisions**

- Normal Retirement Eligibility:** A member may retire with an unreduced pension benefit upon Normal Retirement on or after age 60 with credit for five years of service.
- Early Retirement Eligibility:** A member may retire early with a reduced pension benefit after reaching age 50 with at least five years of service credit.
- Disability Retirement Eligibility:** A member is eligible for disability retirement benefits from the first day of employment.



Appendix B – Summary of Main Benefit Provisions (continued)

VIRGINIA LINE OF DUTY ACT Plan Specific Benefit Provisions

Disability Retirement Eligibility: VRS State Employees (including those of the Virginia Port Authority) hired prior to January 1, 2008 are assumed to be eligible to retire at age 55 with 5 years of creditable service or age 50 with 10 years of creditable service. VRS State Employees hired on or after January 1, 2008 are assumed to be eligible to retire at age 60 with 5 years of creditable service or upon the sum of their age and their service being 90 (Rule of 90). All other employees are assumed to be eligible for retirement at age 50 with 5 years of creditable service.



Appendix C – Statement of Actuarial Assumptions

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*.

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Assumptions and Methods which apply to all OPEB Plans

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

LODA is 4.75% per annum, compounded annually.

Inflation Assumption: 2.50% per year.

Actuarial Cost Method: Entry age normal cost method, allocated as a level percent of payroll, from first funding age to last age before terminal retirement age. Actuarial gains and losses, as they occur, are reflected in the unfunded actuarial accrued liability. See Schedule H for a detailed explanation.

Funding Period: The amortization period of the legacy UAAL began at 30 years on June 30, 2013 and this amortization period is to decrease by one year on each subsequent valuation date until the legacy UAAL is fully amortized (amortization period of 0 years). With each subsequent valuation, a new amortization base will be used to amortize that portion of the UAAL not covered by the current balances of the previously established amortization bases. Here, each valuation's newly allocated share of the UAAL will be amortized over a closed 20-year period.

The amortization payment includes an adjustment of 1.019233 to account for the passage of time from the valuation date to the date the contribution is made.

LODA is pay as you go.



Appendix C – Statement of Actuarial Assumptions (continued)

Payroll Growth Rate: 3.00% per annum.

Administrative Expenses: The employer contribution rates include a rate for anticipated non-investment expenses based on actual prior year experience.

LODA is assumed to be \$500,000 for fiscal year 2019 with 3% increases in the future.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Group Life Insurance Program

Asset Valuation Method: For the purposes of GASB 74/75, the value of assets is equal to the market value of assets.

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 asset value cannot be less than 80% or more than 120% of the market value of assets.

Minimum Benefit: Beginning with the fiscal year ending June 30, 2016, in no event will the death benefit be less than \$8,000 for members who retire with at least 30 years of creditable service. Between June 30, 2016 and the current valuation date, this minimum is indexed at the same rate as the post-retirement supplement for retirees hired on or after July 1, 2010. Beginning on the valuation date, this minimum is assumed to increase annually, effective July 1, by 2.25% (the same assumed annual increase percentage for any annual post-retirement supplement for retirees, as calculated for employees hired on or after July 1, 2010).

“Life Insurance Only” Retirees: Results include an estimate of retiree liability for those groups not providing retiree census data. A liability equaling 10% of the active employee liability times the average retiree to active liability ratio is assumed.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Health Insurance Credit Program State Employees and Teachers

Asset Valuation Method: For the purposes of GASB 74/75, the value of assets is equal to the market value of assets.

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 asset value cannot be less than 80% or more than 120% of the market value of assets.

Participation Rates: 95% of eligible future service retirees from active status are assumed to utilize the benefit plan.

Eligible future service retirees from deferred vested status are assumed to utilize the benefit plan as follows:

Duration Since Retirement	Participation Rate
First Year	55.0%
Second Year	65.0%
Third Year	70.0%
Fourth Year	75.0%
Fifth Year	80.0%
Sixth Year	85.0%
Seventh Year	90.0%
Eighth Year and Beyond	95.0%

Participation Rates (continued): Eligible future disabled benefit recipients from active status are assumed to utilize the benefit plan as follows:

System	Participation
State/JRS	95%
Teachers	90%
SPORS/VaLORS	75%



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Health Insurance Credit Program State Employees and Teachers (continued)

Percentage Not Utilizing the Maximum Benefit:

The percentage of eligible future benefit recipients assumed to utilize the benefit plan, but not receive the maximum benefit for which they are eligible is as follows:

System	Percentage
State/JRS	10%
Teachers	20%
SPORS/VaLORS	20%

Percentage of Maximum Benefit Received:

Eligible future benefit recipients assumed to utilize the benefit plan, but not receive the maximum benefit for which they are eligible are assumed to initially receive 70% of the maximum benefit for which they are eligible.

Annual Increase in Benefit for Those Not Receiving the Maximum Benefit:

Benefit recipients assumed to utilize the benefit plan, but not receiving the maximum benefit for which they are eligible are assumed to have their benefit increase at the following rates:

Duration Since Retirement	Annual Increase in HIC benefit
1 Year	6.50%
2 – 3 Years	4.25%
4 or More Years	3.00%

Percentage of Future Eligible Deferred Vested Members Electing to Withdraw from VRS:

The percentage of future eligible deferred vested members assumed to withdraw from VRS is as follows:

System	Percentage
State/JRS	50%
Teachers	35%
SPORS/VaLORS	70%



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Health Insurance Credit Program State Employees and Teachers (continued)

Deferred Vested Deferral Period: Eligible deferred vested members are assumed to begin receiving benefits at the following ages:

System	Age of Initial Benefit Receipt
State/JRS/Teachers	
Plan 1 Members	60
Plan 2 and Hybrid Plan Members	
Born prior to 1938	60
Born after 1937 and before 1960	61
Born after 1959	62
SPORS/VaLORS	
Members with less than 25 years of service	55
Members with 25 or more years of service	50

ORP and UVA Retirees:

Results include an estimate of retiree liability for those groups not providing retiree census data. A liability equaling 10% of the active employee liability times the average retiree to active liability ratio is assumed.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Health Insurance Credit Program Political Subdivisions and Special Coverage Groups

Asset Valuation Method: Market value of assets.

Participation Rates: 85% of eligible future service retirees from active status are assumed to utilize the benefit plan. 45.00% of eligible future disability retirees will utilize the benefit.

Eligible future service retirees from deferred vested status are assumed to utilize the benefit plan as follows:

Duration Since Retirement	Participation Rate
First Year	55.0%
Second Year	65.0%
Third Year	70.0%
Fourth Year	75.0%
Fifth Year	80.0%
Sixth Year	85.0%
Seventh Year	90.0%
Eighth Year and Beyond	95.0%

Percentage Not Utilizing the Maximum Benefit: 10% of eligible future benefit recipients are assumed to utilize the benefit plan, but not receive the maximum benefit for which they are eligible.

Percentage of Maximum Benefit Received: Eligible future benefit recipients assumed to utilize the benefit plan, but not receive the maximum benefit for which they are eligible are assumed to initially receive 70% of the maximum benefit for which they are eligible.

Annual Increase in Benefit for Those Not Receiving the Maximum Benefit: Benefit recipients assumed to utilize the benefit plan, but not receiving the maximum benefit for which they are eligible are assumed to have their benefit increase at the following rates:

Duration Since Retirement	Annual Increase in HIC benefit
1 Year	6.50%
2 – 3 Years	4.25%
4 or More Years	3.00%



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Health Insurance Credit Program Political Subdivisions and Special Coverage Groups (continued)

Percentage of Future Eligible Deferred Vested Members Electing to Withdraw from VRS: 45% of future eligible deferred vested members are assumed to withdraw from VRS.

Deferred Vested Deferral Period: Eligible deferred vested members with LEOs/Fire Pension Benefit Coverage are assumed to receive benefits at age 55 (if the member has less than 25 years of service at retirement) and at age 50 (if the member has 25 or more years of service at retirement). Eligible deferred vested members with General Employee Pension Benefit Coverage are assumed to receive benefits as follows:

Political Subdivisions and Special Coverage Groups	Age of Initial Benefit Receipt
Plan 1 Members	60
Plan 2 and Hybrid Plan Members	
Born prior to 1938	60
Born after 1937 and before 1960	61
Born after 1959	62

Employer Groups: The political subdivisions have been divided into two groups. Group A consists of: City of Virginia Beach, Henrico County, Prince William County, Chesterfield County, City of Chesapeake, City of Alexandria, City of Hampton, Loudoun County, City of Lynchburg, and the City of Portsmouth. Group B is all other political subdivisions not included in Group A.

Additional Funding Charge: An additional funding charge will be included in the contribution rate, if needed, to allow the use of the 6.75% investment return assumption to be used as the single equivalent interest rate assumption for GASB 74/75 purposes.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Disability Benefits and Long-Term Care Benefits

Asset Valuation Method: For the purposes of GASB 74/75, the value of assets is equal to the market value of assets.

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 asset value cannot be less than 80% or more than 120% of the market value of assets.

Health Insurance Credit and Group Life Insurance Benefits Health Insurance Credit and Group Life Insurance benefits provided by VSDP are valued under the respective plans.

Disability: A Plan 1 Member hired prior to January 1, 1999 and who has elected VSDP coverage or any member hired on or after January 1, 1999. Applicable members hired prior to July 1, 2009 are eligible from the first day of employment for work related and non-work related VSDP disability benefits. Applicable members hired on or after July 1, 2009 are eligible from the first day of employment for work-related VSDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VSDP disability benefits.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Disability Benefits

Cost-Of-Living Increase:

Plan 1 Members: 2.50% per year, compounded annually.

Plan 2 and Hybrid Members: 2.25% per year, compounded annually.

Liability Assumed for Disabled Members in Waiting Period:

The liability associated for those disabled and not yet eligible to receive benefits was based upon the development method in which plan experience was applied to those claims reported in the second half of the most recent fiscal year.

Income Replacement for Future Disabled Members:

61% of a member's pre-disability income.

Percentage of Members with Social Security Offsets:

70.5% of members are assumed to meet the Social Security definition of Disability, and are thus eligible for an additional 1% of Income Replacement.

Offsets for Disabled Members:

It is assumed that the offset amounts reported by the administrator will continue to apply to each member's benefit until the benefit expires. For members with less than eight years of disability and no current benefit offsets, benefit amounts are adjusted to reflect future offsets as follows:

Year of Long-Term Disability	Percentage Receiving Offsets in the Next Year if Currently Not in Receipt	Average Percentage of Full Benefit Paid if in Receipt of Offsets
1	35%	25%
2	30%	26%
3	24%	27%
4	14%	27%
5	14%	27%
6	9%	27%
7	6%	27%
8 and Longer	0%	30%



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Disability Benefits (continued)

Offsets for Active Members:

The following benefit adjustments are assumed for the expected future monthly benefits to be paid to future disabled members. The benefit adjustments are consistent with recent experience.

Year of Long-Term Disability	Benefit Adjustment Factor
1	0.723
2	0.575
3	0.465
4	0.403
5	0.367
6-9	0.342
10-13	0.404
14	0.411
15 and Longer	0.450

Rates of Termination of Benefits Due to Death or Recovery:

2012 Group Long Term Disability Valuation Table (2012 GLDT) as proposed by the Society of Actuaries' Group Disability Experience Committee for use by the National Association of Insurance Commissioners. Used as a basis those rates applicable to plans with a six-month elimination period, "Own Occupation" definition of disability in the first twenty-four months and "Any Occupation" definition of disability for the twenty-fifth month onward, initial maximum guaranteed benefit of \$1,900, "No Diagnosis" cause of disability, 15% margin for recovery, 28% margin for deaths, and adjusted for prior five years of VRS experience with the following adjustment factors:

Month of Disability	Male	Female
4 - 24	0.904	0.908
25 - 60	0.891	0.943
61 - 120	1.052	1.025
121 and over	1.021	0.999



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Care Benefits

Disabled Life Reserve:	The liability associated for those participants assumed to be in a current benefit period was based upon the development method in which prior experience was applied to the current claim duration and prior payments made for each individual.
Incurred But Not Reported Reserve:	The liability associated for those participants with claims that have been incurred but not reported (IBNR), as of the valuation date, to the administrator was based upon the development method in which prior experience for claim incidence and expected benefits payments was applied to the covered population.
Morbidity:	CMC reviewed the rates developed by the prior actuary against rates developed using the Society of Actuaries (SOA) Long Term Care basic experience rate tables and made no modifications. While separate rates for assisted living facility claims are not used, our review indicates the nursing facility rates are reasonable based upon the benefit structure and a comparison to the combined experience produced by the SOA's tables. As experience develops the rates will need to be reviewed and adjusted accordingly.

Unadjusted Claim Incidence Rates				
Attained Age	Nursing Facility		Home Health	
	Male	Female	Male	Female
25	0.00001	0.00001	0.00008	0.00008
30	0.00003	0.00002	0.00010	0.00010
35	0.00008	0.00005	0.00012	0.00013
40	0.00013	0.00009	0.00018	0.00015
45	0.00021	0.00014	0.00028	0.00017
50	0.00031	0.00020	0.00039	0.00029
55	0.00047	0.00029	0.00053	0.00047
60	0.00060	0.00065	0.00085	0.00092
65	0.00100	0.00107	0.00150	0.00162
70	0.00210	0.00191	0.00249	0.00295
75	0.00480	0.00507	0.00482	0.00541
80	0.01023	0.01327	0.00895	0.00917
85	0.02155	0.03171	0.01541	0.01511
90	0.04111	0.06180	0.02249	0.02042
95	0.05844	0.08370	0.02522	0.02190
100	0.07276	0.09756	0.02598	0.02198
105	0.09059	0.11372	0.02677	0.02206
110+	0.11279	0.13255	0.02758	0.02213



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Care Benefits (continued)

Morbidity (continued):

For actively employed members, the unadjusted claim incidence rates are adjusted by the following selection factors based upon length of VSDP membership and age of entry into VSDP.

Claim Incidence Selection Factors			
Actively Employed Members			
Years of VSDP Membership	VSDP Entry Age		
	<50	50 - 64	65+
1	0.133	0.138	0.164
2	0.217	0.222	0.256
3	0.284	0.289	0.342
4	0.334	0.341	0.438
5	0.367	0.375	0.520
6	0.439	0.447	0.547
7	0.473	0.482	0.573
8	0.500	0.511	0.593
9	0.527	0.538	0.612
10	0.561	0.573	0.634
11	0.599	0.612	0.673
12	0.643	0.658	0.719
13	0.702	0.718	0.755
14	0.769	0.787	0.797
15	0.836	0.836	0.840
16	0.851	0.851	0.855
17	0.869	0.869	0.872
18	0.890	0.890	0.893
19	0.915	0.915	0.918
20+	0.945	0.945	0.947



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Care Benefits (continued)

Morbidity (continued):

For ported members, the unadjusted claim incidence rates are adjusted based upon the likelihood of porting and the number of years since porting.

Claim Incidence Selection Factors		
Ported Members		
Porting Rate	Initial Year Of Porting	Ultimate Rate*
0%	2.35	1.19
5%	2.29	1.18
10%	2.22	1.18
15%	2.16	1.17
20%	2.09	1.16
25%	2.03	1.16
30%	1.96	1.15
35%	1.90	1.14
40%	1.83	1.13
45%	1.77	1.13
50%	1.70	1.12
55%	1.64	1.11
60%	1.57	1.11
65%	1.51	1.10
70%	1.44	1.09
75%	1.38	1.09
80%	1.31	1.08
85%	1.25	1.07
90%	1.18	1.06
95%	1.12	1.06
100%	1.05	1.05

* The selection factors are assumed to decrease linearly over a 10 year period.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Care Benefits (continued)

Morbidity (continued):

The duration of a claim is based upon the attained age at incidence, gender, and type of claim.

Attained Age	Length of Stay (Months)			
	Nursing Facility		Home Health	
	Male	Female	Male	Female
25	11.15	13.96	19.14	12.54
30	11.60	14.42	18.81	12.47
35	12.04	14.98	18.67	12.45
40	12.29	14.87	16.77	13.48
45	12.50	14.77	14.99	14.56
50	12.90	14.16	15.36	13.78
55	13.30	13.52	15.77	13.02
60	12.99	14.12	15.15	12.40
65	13.36	14.30	12.84	12.80
70	14.00	14.32	11.80	13.53
75	13.99	15.09	11.50	13.50
80	13.76	15.61	10.90	13.18
85	13.62	15.90	10.05	12.86
90	13.09	16.19	8.78	12.70
95	12.30	16.51	8.23	12.66
100	11.32	16.10	8.70	13.34
105	9.84	14.77	9.56	14.60
110+	8.31	13.32	9.33	14.89

Daily Benefit Amount:

\$96 per day indemnity benefit paid for service in a nursing home. The daily benefit for home health care coverage is 50% of the nursing home benefit.

Daily Benefit Amount Increases:

The valuation does not include a provision for increases (i.e., 5% compound increase every five years). If the benefit policy is to provide increases at regular intervals, the resulting liability will be materially greater than the results presented (i.e., inflation increases are not assumed to be pre-funded).

Benefit Maximums:

A lifetime maximum benefit of \$70,080 (reflects a two year maximum coverage period based upon a \$96 per day indemnity benefit).



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Care Benefits (continued)

Porting Rates:

Porting rate assumptions are based upon experience over the first five years of the program, with substantial increases over the life of the program. CMC reviewed the rates developed by the prior actuary and made no modifications. As the porting rates have a significant impact on results, experience, as it develops, will need to be reviewed and the rates adjusted accordingly. Porting rates by age of entry into VSDP and length of VSDP membership are provided in the following table.

VSDP Entry Age	Years of VSDP Membership										
	0	5	10	15	20	25	30	35	40	45	50+
25	0.1000	0.1010	0.1144	0.1313	0.1739	0.2555	0.3693	0.5263	0.6812	0.8874	1.0000
30	0.1000	0.1019	0.1234	0.1534	0.2185	0.3194	0.4537	0.5822	0.7574	0.9609	1.0000
35	0.1000	0.1021	0.1303	0.1778	0.2683	0.3935	0.5001	0.6454	0.8406	1.0000	1.0000
40	0.1000	0.1063	0.1608	0.2383	0.3423	0.4320	0.5526	0.7169	0.9230	1.0000	1.0000
45	0.1001	0.1177	0.2001	0.2931	0.3754	0.4755	0.6119	0.7978	0.9983	1.0000	1.0000
50	0.1027	0.1304	0.2244	0.3262	0.4116	0.5247	0.6790	0.8833	1.0000	1.0000	1.0000
55	0.1072	0.1410	0.2422	0.3585	0.4524	0.5804	0.7549	0.9624	1.0000	1.0000	1.0000
60	0.1162	0.1596	0.2667	0.3924	0.4986	0.6434	0.8407	1.0000	1.0000	1.0000	1.0000
65	0.1329	0.1887	0.2999	0.4307	0.5508	0.7146	0.9257	1.0000	1.0000	1.0000	1.0000
70	0.1485	0.2129	0.3308	0.4741	0.6099	0.7952	0.9985	1.0000	1.0000	1.0000	1.0000
75	0.1700	0.2444	0.3693	0.5231	0.6768	0.8863	1.0000	1.0000	1.0000	1.0000	1.0000
80	0.1875	0.2682	0.4043	0.5786	0.7524	0.9645	1.0000	1.0000	1.0000	1.0000	1.0000
85	0.1941	0.2770	0.4310	0.6413	0.8379	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
90	0.2012	0.2863	0.4601	0.7123	0.9347	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
95	0.2088	0.2960	0.4917	0.7925	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.2171	0.3063	0.5261	0.8833	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
105	0.2259	0.3171	0.5635	0.9860	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
110	0.2354	0.3284	0.6042	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
115	0.2457	0.3404	0.6485	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
120	0.2567	0.3529	0.6966	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Sickness and Disability Program Long-Term Care Benefits (continued)

Porting Premiums:

While actively employed or receiving LTD benefits, a member receives coverage in the amount currently in place for the entire actively employed group. Upon termination of employment, a member has the option to port the amount of coverage current for the group by paying a premium. CMC reviewed the rates developed by the prior actuary for adequacy and made no modifications. As experience develops the rates may need to be reviewed and adjusted accordingly.

Monthly Porting Premium Rates Per \$1 of Daily Benefit Amount							
VSDP Entry Age	Rate	VSDP Entry Age	Rate	VSDP Entry Age	Rate	VSDP Entry Age	Rate
20	0.018	38	0.070	56	0.233	74	1.212
21	0.019	39	0.075	57	0.255	75	1.331
22	0.020	40	0.078	58	0.278	76	1.466
23	0.022	41	0.084	59	0.305	77	1.619
24	0.023	42	0.089	60	0.335	78	1.786
25	0.025	43	0.095	61	0.368	79	1.968
26	0.028	44	0.100	62	0.406	80	2.153
27	0.030	45	0.106	63	0.448	81	2.329
28	0.033	46	0.112	64	0.497	82	2.503
29	0.035	47	0.121	65	0.539	83	2.676
30	0.038	48	0.128	66	0.596	84	2.835
31	0.041	49	0.136	67	0.662	85	2.971
32	0.046	50	0.144	68	0.717	86	3.134
33	0.050	51	0.155	69	0.777	87	3.277
34	0.053	52	0.166	70	0.845	88	3.405
35	0.057	53	0.180	71	0.922	89	3.522
36	0.061	54	0.196	72	1.007	90	3.610
37	0.065	55	0.213	73	1.105		



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Disability Benefits and Long-Term Care Benefits

Asset Valuation Method:	<p>For the purposes of GASB 74/75, the value of assets is equal to the market value of assets.</p> <p>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 asset value cannot be less than 80% or more than 120% of the market value of assets.</p>
Health Insurance Credit and Group Life Insurance Benefits:	<p>Health Insurance Credit (if applicable) and Group Life Insurance benefits provided under VLDP are valued under the respective plans.</p>
Disability:	<p>Applicable members covered under the Hybrid Plan are eligible from the first day of employment for work-related VLDP disability benefits, but must have a minimum of one year of service to be eligible for non-work related VLDP disability benefits.</p>



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Disability Benefits

Cost-Of-Living Increase:	0.00% per year, compounded annually.
Liability Assumed for Disabled Members in Waiting Period:	The liability associated for those disabled and not yet eligible to receive benefits was based upon the expected number of long-term disabilities incurred during the period of January 1, 2016 and June 30, 2016.
Income Replacement for Future Disabled Members:	61% of a member's pre-disability income.
Percentage of Members with Social Security Offsets:	70.5% of members are assumed to meet the Social Security definition of Disability, and are thus eligible for an additional 1% of Income Replacement.
Offsets for Disabled Members:	It is assumed that the offset amounts reported by the administrator will continue to apply to each member's benefit until the benefit expires. For members with less than six years of disability and no current benefit offsets, benefit amounts are adjusted to reflect future offsets as follows:

Year of Long-Term Disability	Percentage Receiving Offsets in the Next Year if Currently Not in Receipt	Average Percentage of Full Benefit Paid if in Receipt of Offsets
1	35%	25%
2	30%	26%
3	24%	27%
4	14%	27%
5	14%	27%
6	9%	27%
7	6%	27%
8 and Longer	0%	30%



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Disability Benefits (continued)

Offsets for Active Members:

The following benefit adjustments are assumed for the expected future monthly benefits to be paid to future disabled members. The benefit adjustments are consistent with recent experience.

Year of Long-Term Disability	Benefit Adjustment Factor
1	0.723
2	0.575
3	0.465
4	0.403
5	0.367
6-9	0.342
10-13	0.404
14	0.411
15 and Longer	0.450

Rates of Termination of Benefits Due to Death or Recovery:

2012 Group Long Term Disability Valuation Table (2012 GLDT) as proposed by the Society of Actuaries' Group Disability Experience Committee for use by the National Association of Insurance Commissioners. Used as a basis those rates applicable to plans with a six-month elimination period, "Own Occupation" definition of disability, initial maximum guaranteed benefit of \$1,900, "No Diagnosis" cause of disability, 15% margin for recovery, 28% margin for deaths, and adjusted for prior five years of VRS experience with the following adjustment factors:

Adjustment Factor

Month of Disability	Male	Female
4 - 24	0.904	0.907
25 - 60	0.891	0.943
61 - 120	1.052	1.025
121 and over	1.021	0.999



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Care Benefits

Disabled Life Reserve:	The liability associated for those participants assumed to be in a current benefit period was based upon the development method in which prior experience was applied to the current claim duration and prior payments made for each individual.
Incurred But Not Reported Reserve:	The liability associated for those participants with claims that have been incurred but not reported (IBNR) as of the valuation date to the administrator was based upon the development method in which prior experience for claim incidence and expected benefits payments was applied to the covered population.
Morbidity:	CMC reviewed the rates developed by the prior actuary against rates developed using the Society of Actuaries (SOA) Long Term Care basic experience rate tables and made no modifications. While separate rates for assisted living facility claims are not used, our review indicates the nursing facility rates are reasonable based upon the benefit structure and a comparison to the combined experience produced by the SOA's tables. As experience develops the rates will need to be reviewed and adjusted accordingly.

Unadjusted Claim Incidence Rates				
Attained Age	Nursing Facility		Home Health	
	Male	Female	Male	Female
25	0.00001	0.00001	0.00008	0.00008
30	0.00003	0.00002	0.00010	0.00010
35	0.00008	0.00005	0.00012	0.00013
40	0.00013	0.00009	0.00018	0.00015
45	0.00021	0.00014	0.00028	0.00017
50	0.00031	0.00020	0.00039	0.00029
55	0.00047	0.00029	0.00053	0.00047
60	0.00060	0.00065	0.00085	0.00092
65	0.00100	0.00107	0.00150	0.00162
70	0.00210	0.00191	0.00249	0.00295
75	0.00480	0.00507	0.00482	0.00541
80	0.01023	0.01327	0.00895	0.00917
85	0.02155	0.03171	0.01541	0.01511
90	0.04111	0.06180	0.02249	0.02042
95	0.05844	0.08370	0.02522	0.02190
100	0.07276	0.09756	0.02598	0.02198
105	0.09059	0.11372	0.02677	0.02206
110+	0.11279	0.13255	0.02758	0.02213



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Care Benefits (continued)

Morbidity (continued):

For actively employed members, the unadjusted claim incidence rates are adjusted by the following selection factors based upon length of VLDP membership and age of entry into VLDP.

Claim Incidence Selection Factors			
Actively Employed Members			
Years of VLDP Membership	VLDP Entry Age		
	<50	50 - 64	65+
1	0.133	0.138	0.164
2	0.217	0.222	0.256
3	0.284	0.289	0.342
4	0.334	0.341	0.438
5	0.367	0.375	0.520
6	0.439	0.447	0.547
7	0.473	0.482	0.573
8	0.500	0.511	0.593
9	0.527	0.538	0.612
10	0.561	0.573	0.634
11	0.599	0.612	0.673
12	0.643	0.658	0.719
13	0.702	0.718	0.755
14	0.769	0.787	0.797
15	0.836	0.836	0.840
16	0.851	0.851	0.855
17	0.869	0.869	0.872
18	0.890	0.890	0.893
19	0.915	0.915	0.918
20+	0.945	0.945	0.947



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Care Benefits (continued)

Morbidity (continued):

For ported members, the unadjusted claim incidence rates are adjusted based upon the likelihood of porting and the number of years since porting.

Claim Incidence Selection Factors		
Ported Members		
Porting Rate	Initial Year Of Porting	Ultimate Rate*
0%	2.35	1.19
5%	2.29	1.18
10%	2.22	1.18
15%	2.16	1.17
20%	2.09	1.16
25%	2.03	1.16
30%	1.96	1.15
35%	1.90	1.14
40%	1.83	1.13
45%	1.77	1.13
50%	1.70	1.12
55%	1.64	1.11
60%	1.57	1.11
65%	1.51	1.10
70%	1.44	1.09
75%	1.38	1.09
80%	1.31	1.08
85%	1.25	1.07
90%	1.18	1.06
95%	1.12	1.06
100%	1.05	1.05

* The selection factors are assumed to decrease linearly over a 10 year period.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Care Benefits (continued)

Morbidity (continued):

The duration of a claim is based upon the attained age at incidence, gender, and type of claim.

Attained Age	Length of Stay (Months)			
	Nursing Facility		Home Health	
	Male	Female	Male	Female
25	11.15	13.96	19.14	12.54
30	11.60	14.42	18.81	12.47
35	12.04	14.98	18.67	12.45
40	12.29	14.87	16.77	13.48
45	12.50	14.77	14.99	14.56
50	12.90	14.16	15.36	13.78
55	13.30	13.52	15.77	13.02
60	12.99	14.12	15.15	12.40
65	13.36	14.30	12.84	12.80
70	14.00	14.32	11.80	13.53
75	13.99	15.09	11.50	13.50
80	13.76	15.61	10.90	13.18
85	13.62	15.90	10.05	12.86
90	13.09	16.19	8.78	12.70
95	12.30	16.51	8.23	12.66
100	11.32	16.10	8.70	13.34
105	9.84	14.77	9.56	14.60
110+	8.31	13.32	9.33	14.89

Daily Benefit Amount:

\$96 per day indemnity benefit paid for service in a nursing home. The daily benefit for home health care coverage is 50% of the nursing home benefit.

Daily Benefit Amount Increases:

The valuation does not include a provision for increases (i.e., 5% compound increase every five years). If the benefit policy is to provide increases at regular intervals, the resulting liability will be materially greater than the results presented (i.e., inflation increases are not assumed to be pre-funded).

Benefit Maximums:

A lifetime maximum benefit of \$70,080 (reflects a two year maximum coverage period based upon a \$96 per day indemnity benefit).



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Care Benefits (continued)

Porting Rates:

Porting rate assumptions are based upon experience over the first five years of the program, with substantial increases over the life of the program. CMC reviewed the rates developed by the prior actuary and made no modifications. As the porting rates have a significant impact on results, experience, as it develops, will need to be reviewed and the rates adjusted accordingly. Porting rates by age of entry into VLDP and length of VLDP membership are provided in the following table.

VLDP Entry Age	Years of VLDP Membership										
	0	5	10	15	20	25	30	35	40	45	50+
25	0.1000	0.1010	0.1144	0.1313	0.1739	0.2555	0.3693	0.5263	0.6812	0.8874	1.0000
30	0.1000	0.1019	0.1234	0.1534	0.2185	0.3194	0.4537	0.5822	0.7574	0.9609	1.0000
35	0.1000	0.1021	0.1303	0.1778	0.2683	0.3935	0.5001	0.6454	0.8406	1.0000	1.0000
40	0.1000	0.1063	0.1608	0.2383	0.3423	0.4320	0.5526	0.7169	0.9230	1.0000	1.0000
45	0.1001	0.1177	0.2001	0.2931	0.3754	0.4755	0.6119	0.7978	0.9983	1.0000	1.0000
50	0.1027	0.1304	0.2244	0.3262	0.4116	0.5247	0.6790	0.8833	1.0000	1.0000	1.0000
55	0.1072	0.1410	0.2422	0.3585	0.4524	0.5804	0.7549	0.9624	1.0000	1.0000	1.0000
60	0.1162	0.1596	0.2667	0.3924	0.4986	0.6434	0.8407	1.0000	1.0000	1.0000	1.0000
65	0.1329	0.1887	0.2999	0.4307	0.5508	0.7146	0.9257	1.0000	1.0000	1.0000	1.0000
70	0.1485	0.2129	0.3308	0.4741	0.6099	0.7952	0.9985	1.0000	1.0000	1.0000	1.0000
75	0.1700	0.2444	0.3693	0.5231	0.6768	0.8863	1.0000	1.0000	1.0000	1.0000	1.0000
80	0.1875	0.2682	0.4043	0.5786	0.7524	0.9645	1.0000	1.0000	1.0000	1.0000	1.0000
85	0.1941	0.2770	0.4310	0.6413	0.8379	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
90	0.2012	0.2863	0.4601	0.7123	0.9347	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
95	0.2088	0.2960	0.4917	0.7925	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.2171	0.3063	0.5261	0.8833	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
105	0.2259	0.3171	0.5635	0.9860	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
110	0.2354	0.3284	0.6042	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
115	0.2457	0.3404	0.6485	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
120	0.2567	0.3529	0.6966	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Local Disability Program Long-Term Care Benefits (continued)

Porting Premiums:

While actively employed or receiving LTD benefits, a member receives coverage in the amount currently in place for the entire actively employed group. Upon termination of employment, a member has the option to port the amount of coverage current for the group by paying a premium. CMC reviewed the rates developed by the prior actuary for adequacy and made no modifications. As experience develops the rates may need to be reviewed and adjusted accordingly.

Monthly Porting Premium Rates Per \$1 of Daily Benefit Amount

VLDP Entry Age	Rate	VLDP Entry Age	Rate	VLDP Entry Age	Rate	VLDP Entry Age	Rate
20	0.018	38	0.070	56	0.233	74	1.212
21	0.019	39	0.075	57	0.255	75	1.331
22	0.020	40	0.078	58	0.278	76	1.466
23	0.022	41	0.084	59	0.305	77	1.619
24	0.023	42	0.089	60	0.335	78	1.786
25	0.025	43	0.095	61	0.368	79	1.968
26	0.028	44	0.100	62	0.406	80	2.153
27	0.030	45	0.106	63	0.448	81	2.329
28	0.033	46	0.112	64	0.497	82	2.503
29	0.035	47	0.121	65	0.539	83	2.676
30	0.038	48	0.128	66	0.596	84	2.835
31	0.041	49	0.136	67	0.662	85	2.971
32	0.046	50	0.144	68	0.717	86	3.134
33	0.050	51	0.155	69	0.777	87	3.277
34	0.053	52	0.166	70	0.845	88	3.405
35	0.057	53	0.180	71	0.922	89	3.522
36	0.061	54	0.196	72	1.007	90	3.610
37	0.065	55	0.213	73	1.105		



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Line of Duty Act

Asset Valuation Method: Market Value of Assets

Service Related Disabilities: Disabilities are assumed to be service related and result in coverage under the Plan based on the following:

Group	Qualifying Disability %
State	10%
SPORS	70%
VaLORS	10%
Non Top 10 LEOS	65%
Top 10 LEOS	70%

Service Related Deaths: 25% of active employee deaths. Of the service related deaths, 42% are assumed to be paid as a direct or proximate result of the performance of duty, with the remainder paid under the presumptive clause.

Spouse Health Care Coverage: Actual data provided is used for current beneficiaries. 67% of service-related deaths and 80% of service-related disabilities assumed to result in spouse coverage, with wives assumed to be three years younger than husbands.

VRS Health Insurance Credit: Health care costs of the Plan are assumed to be reduced by an amount equal to the disabled health insurance credit paid by the VRS Health Insurance Credit Program for eligible disabled employees. An annual credit of \$1,440 or \$48 per year of service, whichever is greater, is assumed for those employees who are members of the VRS State, VaLORS, or SPORS plans and an annual credit of \$540 is assumed for those employees who are members of a VRS political subdivision participating in the VRS Health Insurance Credit Program.



Appendix C – Statement of Actuarial Assumptions (continued)

Assumptions and Methods Applicable to the Virginia Line of Duty Act (continued)

Health Care Cost Trend Rate: The initial per capita health care costs are expected to increase each year with inflation (trend). The following chart details the trend assumption.

Fiscal Year Ended	Under Age 65	Ages 65 and Older
2018	7.25%	5.500%
2019	7.00%	5.375%
2020	6.75%	5.250%
2021	6.50%	5.125%
2022	6.25%	5.000%
2023	6.00%	4.750%
2024	5.75%	4.750%
2025	5.50%	4.750%
2026	5.25%	4.750%
2027	5.00%	4.750%
2028 and Beyond	4.75%	4.750%

Eligibility for Medicare Due to Age:

For Plan beneficiaries who become eligible for health care benefits as the result of a death or disability occurring after June 30, 2017, 80% of disabled employees who become disabled 29 or more months prior to their sixty-fifth birthday are assumed to be eligible for Medicare due to age (age 65). 100% of all other Plan beneficiaries who become eligible for health care benefits as the result of a death or disability occurring after June 30, 2017 are assumed to be eligible for Medicare due to age.

Initial Per Capita Health Care Costs:

Paid claims and cost data were provided by the DOA. CMC accepted this information without audit and has relied upon the sources for the accuracy of the data.

Assumed adult per capita costs are based on past experience and trended forward to the valuation period. Experience for Medicare eligible participants was limited, particularly for Political Subdivision Employees, and future experience may differ materially. As some beneficiaries elect to cover dependents, the assumed adult costs include the additional costs for the coverage of dependent children.



Appendix C – Statement of Actuarial Assumptions (continued)

Initial Monthly Per Capita Adult Health Care Costs		
Valuation Date	Under Age 65*	Ages 65 and Older
June 30, 2017	\$1,065.70	\$505.00
June 30, 2018	\$1,186.01	\$506.50

*Includes the assumed additional cost for the coverage of dependent children.

Age Related Morbidity:

All health care costs assumed not to be related to covered dependent children are age-adjusted. The following chart details the expected health care claims, age-adjusted to age 65, and the associated assumed increases to the net incurred claims:

Beneficiary Attained Age	Annual Increase
<30	0.0%
30 – 34	1.0%
35 – 39	1.5%
40 – 44	2.0%
45 - 49	2.6%
50 – 54	3.3%
55 – 59	3.6%
60 – 64	4.2%
65 – 69	3.0%
70 – 74	2.5%
75 – 79	2.0%
80 – 84	1.0%
85 – 89	0.5%
90 and Older	0.0%



Appendix C – Statement of Actuarial Assumptions (continued)

STATE EMPLOYEES¹

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:

R P-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; 1.5% increase compounded from ages 70 to 85, females setback 1 year

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.

¹ The actuarial assumptions for State are also applied to the applicable members of the Optional Retirement Plan (ORP)



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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.



Appendix C – Statement of Actuarial Assumptions (continued)

TEACHERS¹

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.

¹ The actuarial assumptions for Teachers are also applied to the applicable members of the Optional Retirement Plan (ORP).



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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	0.000	0.225	0.225	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	0.000	0.225	0.225	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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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

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

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



Appendix C – Statement of Actuarial Assumptions (continued)

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.



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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.



Appendix C – Statement of Actuarial Assumptions (continued)

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:

R P-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.



Appendix C – Statement of Actuarial Assumptions (continued)

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.



Appendix C – Statement of Actuarial Assumptions (continued)

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 BB to 2020; M 90% of Rates; F SF 1yr

Post-Retirement:

RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older
Projected BB to 2020; M SF 1yr, 1% increase compounded from ages 70 to 90; F
SF 3yr.

Post-Disablement:

RP-2014 Disabled Mortality Rates Projected BB to 2020; M SF 2yr; 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.



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

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
	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.



Appendix C – Statement of Actuarial Assumptions (continued)

LOCALS – TOP 10, NON-LEO

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 95% of rates; females 105% of rates

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 3 years; females 1.0% increase compounded from ages 70 to 90

Post-Disablement:

RP-2014 Disabled Mortality Rates projected with scale BB to 2020; males set forward 2 years, 110% of rates; females 125% of rates

Top 10 non-LEO Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00038	0.00050	0.00923	0.00017	0.00016	0.00274
25	0.00045	0.00044	0.00850	0.00018	0.00017	0.00293
30	0.00042	0.00048	0.00902	0.00023	0.00021	0.00369
35	0.00049	0.00056	0.01042	0.00030	0.00028	0.00484
40	0.00059	0.00078	0.01372	0.00041	0.00039	0.00670
45	0.00091	0.00133	0.01991	0.00068	0.00065	0.01111
50	0.00157	0.00495	0.02336	0.00114	0.00272	0.01462
55	0.00260	0.00667	0.02637	0.00171	0.00352	0.01756
60	0.00427	0.00894	0.02950	0.00241	0.00489	0.02001
65	0.00731	0.01285	0.03501	0.00361	0.00749	0.02425
70	0.01202	0.02021	0.04538	0.00616	0.01209	0.03279
75		0.03312	0.06223		0.02067	0.04772
80		0.05662	0.08955		0.03616	0.07096
85		0.10039	0.13529		0.06599	0.10513
90		0.17537	0.21057		0.12354	0.15517

20% 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.



Appendix C – Statement of Actuarial Assumptions (continued)

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

Top 10 non-LEO Retirement Rates, Plan 1 Male with 50/30 eligibility							
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	0.028	0.028	0.100	0.100
51	0.000	0.000	0.000	0.070	0.035	0.100	0.060
52	0.000	0.000	0.000	0.070	0.035	0.100	0.090
53	0.000	0.000	0.000	0.070	0.035	0.100	0.090
54	0.000	0.000	0.000	0.070	0.035	0.100	0.100
55	0.000	0.060	0.060	0.060	0.050	0.100	0.100
56	0.000	0.070	0.050	0.050	0.050	0.100	0.125
57	0.000	0.070	0.045	0.045	0.045	0.100	0.125
58	0.000	0.100	0.045	0.045	0.045	0.100	0.090
59	0.000	0.100	0.045	0.045	0.045	0.100	0.140
60	0.000	0.100	0.060	0.060	0.060	0.100	0.140
61	0.000	0.100	0.100	0.100	0.100	0.100	0.140
62	0.000	0.100	0.140	0.140	0.140	0.250	0.300
63	0.000	0.100	0.115	0.115	0.115	0.250	0.170
64	0.000	0.100	0.150	0.150	0.150	0.250	0.250
65	0.000	0.250	0.250	0.250	0.250	0.250	0.370
66	0.000	0.300	0.250	0.250	0.250	0.250	0.250
67	0.000	0.150	0.250	0.250	0.250	0.250	0.250
68	0.000	0.150	0.250	0.250	0.250	0.250	0.250
69	0.000	0.275	0.250	0.250	0.250	0.250	0.250
70	0.000	0.275	0.250	0.250	0.250	0.250	0.250
71	0.000	0.275	0.250	0.250	0.250	0.250	0.250
72	0.000	0.275	0.250	0.250	0.250	0.250	0.250
73	0.000	0.275	0.250	0.250	0.250	0.250	0.250
74	0.000	0.275	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



Appendix C – Statement of Actuarial Assumptions (continued)

Top 10 non-LEO Retirement Rates, Plan 1 Female with 50/30 eligibility							
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	0.035	0.035	0.160	0.160
51	0.000	0.000	0.000	0.035	0.050	0.110	0.085
52	0.000	0.000	0.000	0.035	0.050	0.120	0.085
53	0.000	0.000	0.000	0.035	0.050	0.175	0.085
54	0.000	0.000	0.000	0.045	0.050	0.075	0.085
55	0.000	0.045	0.045	0.045	0.050	0.220	0.160
56	0.000	0.105	0.050	0.050	0.050	0.130	0.160
57	0.000	0.105	0.050	0.050	0.050	0.090	0.160
58	0.000	0.105	0.050	0.050	0.050	0.165	0.160
59	0.000	0.105	0.060	0.060	0.060	0.200	0.160
60	0.000	0.105	0.075	0.075	0.075	0.140	0.160
61	0.000	0.105	0.100	0.100	0.100	0.140	0.160
62	0.000	0.105	0.140	0.140	0.140	0.345	0.275
63	0.000	0.105	0.135	0.135	0.135	0.240	0.275
64	0.000	0.105	0.170	0.170	0.170	0.100	0.180
65	0.000	0.250	0.250	0.250	0.250	0.250	0.275
66	0.000	0.200	0.275	0.275	0.275	0.275	0.275
67	0.000	0.150	0.275	0.275	0.275	0.275	0.275
68	0.000	0.150	0.275	0.275	0.275	0.275	0.275
69	0.000	0.150	0.275	0.275	0.275	0.275	0.275
70	0.000	0.150	0.275	0.275	0.275	0.275	0.275
71	0.000	0.150	0.275	0.275	0.275	0.275	0.275
72	0.000	0.150	0.275	0.275	0.275	0.275	0.275
73	0.000	0.150	0.275	0.275	0.275	0.275	0.275
74	0.000	0.150	0.275	0.275	0.275	0.275	0.275
≥75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Appendix C – Statement of Actuarial Assumptions (continued)

Top 10 non-LEO Retirement Rates, Plan 1 Male with 55/30 eligibility							
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	0.028	0.028	0.028	0.028
51	0.000	0.000	0.000	0.070	0.035	0.035	0.035
52	0.000	0.000	0.000	0.070	0.035	0.035	0.035
53	0.000	0.000	0.000	0.070	0.035	0.035	0.035
54	0.000	0.000	0.000	0.070	0.035	0.035	0.035
55	0.000	0.060	0.060	0.060	0.050	0.100	0.100
56	0.000	0.070	0.050	0.050	0.050	0.100	0.125
57	0.000	0.070	0.045	0.045	0.045	0.100	0.125
58	0.000	0.100	0.045	0.045	0.045	0.100	0.090
59	0.000	0.100	0.045	0.045	0.045	0.100	0.140
60	0.000	0.100	0.060	0.060	0.060	0.100	0.140
61	0.000	0.100	0.100	0.100	0.100	0.100	0.140
62	0.000	0.100	0.140	0.140	0.140	0.250	0.300
63	0.000	0.100	0.115	0.115	0.115	0.250	0.170
64	0.000	0.100	0.150	0.150	0.150	0.250	0.250
65	0.000	0.250	0.250	0.250	0.250	0.250	0.370
66	0.000	0.300	0.250	0.250	0.250	0.250	0.250
67	0.000	0.150	0.250	0.250	0.250	0.250	0.250
68	0.000	0.150	0.250	0.250	0.250	0.250	0.250
69	0.000	0.275	0.250	0.250	0.250	0.250	0.250
70	0.000	0.275	0.250	0.250	0.250	0.250	0.250
71	0.000	0.275	0.250	0.250	0.250	0.250	0.250
72	0.000	0.275	0.250	0.250	0.250	0.250	0.250
73	0.000	0.275	0.250	0.250	0.250	0.250	0.250
74	0.000	0.275	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



Appendix C – Statement of Actuarial Assumptions (continued)

Top 10 non-LEO Retirement Rates, Plan 1 Female with 55/30 eligibility							
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	0.035	0.035	0.035	0.035
51	0.000	0.000	0.000	0.035	0.050	0.050	0.050
52	0.000	0.000	0.000	0.035	0.050	0.050	0.050
53	0.000	0.000	0.000	0.035	0.050	0.050	0.050
54	0.000	0.000	0.000	0.045	0.050	0.050	0.050
55	0.000	0.045	0.045	0.045	0.050	0.220	0.220
56	0.000	0.105	0.050	0.050	0.050	0.130	0.160
57	0.000	0.105	0.050	0.050	0.050	0.090	0.160
58	0.000	0.105	0.050	0.050	0.050	0.165	0.160
59	0.000	0.105	0.060	0.060	0.060	0.200	0.160
60	0.000	0.105	0.075	0.075	0.075	0.140	0.160
61	0.000	0.105	0.100	0.100	0.100	0.140	0.160
62	0.000	0.105	0.140	0.140	0.140	0.345	0.275
63	0.000	0.105	0.135	0.135	0.135	0.240	0.275
64	0.000	0.105	0.170	0.170	0.170	0.100	0.180
65	0.000	0.250	0.250	0.250	0.250	0.250	0.275
66	0.000	0.200	0.275	0.275	0.275	0.275	0.275
67	0.000	0.150	0.275	0.275	0.275	0.275	0.275
68	0.000	0.150	0.275	0.275	0.275	0.275	0.275
69	0.000	0.150	0.275	0.275	0.275	0.275	0.275
70	0.000	0.150	0.275	0.275	0.275	0.275	0.275
71	0.000	0.150	0.275	0.275	0.275	0.275	0.275
72	0.000	0.150	0.275	0.275	0.275	0.275	0.275
73	0.000	0.150	0.275	0.275	0.275	0.275	0.275
74	0.000	0.150	0.275	0.275	0.275	0.275	0.275
≥75	0.000	1.000	1.000	1.000	1.000	1.000	1.000



Appendix C – Statement of Actuarial Assumptions (continued)

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

Top 10 non-LEO Retirement Rates, Plan 2/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	0.100
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	0.100	0.100
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	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	0.100	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	0.100	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	0.100	0.100	0.100	0.100	0.100	0.100
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.125	0.125	0.125	0.125	0.125
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	0.125	0.125	0.125	0.125	0.125	0.125
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	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
60	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
61	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
62	0.000	0.100	0.140	0.140	0.140	0.250	0.250	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	0.100	0.115	0.115	0.250	0.250	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
64	0.000	0.100	0.150	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
65	0.000	0.250	0.250	0.250	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370
66	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
67	0.000	0.150	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	0.150	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	0.275	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
70	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
71	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
72	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
73	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
74	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
>=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



Appendix C – Statement of Actuarial Assumptions (continued)

Top 10 non-LEO Retirement Rates, Plan 2/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	0.160
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	0.110	0.110
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	0.120	0.120	0.085
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	0.085	0.085
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	0.075	0.075	0.085	0.085	0.085
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	0.220	0.220	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	0.130	0.130	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	0.090	0.090	0.160	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	0.165	0.165	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	0.200	0.200	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160
60	0.000	0.105	0.105	0.105	0.105	0.105	0.105	0.140	0.140	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160
61	0.000	0.105	0.100	0.100	0.100	0.100	0.140	0.140	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160
62	0.000	0.105	0.140	0.140	0.140	0.345	0.345	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
63	0.000	0.105	0.135	0.135	0.240	0.240	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
64	0.000	0.105	0.170	0.100	0.100	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
65	0.000	0.250	0.250	0.250	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
66	0.000	0.200	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
67	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
68	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
69	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
70	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
71	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
72	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
73	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
74	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
≥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



Appendix C – Statement of Actuarial Assumptions (continued)

DISABILITY RATES: As shown below for selected ages. 20% of disability cases are assumed to be service related.

Top 10 non-LEO Disability Rates		
Age	Male	Female
20	0.00005	0.00001
25	0.00005	0.00005
30	0.00007	0.00023
35	0.00050	0.00062
40	0.00139	0.00134
45	0.00252	0.00229
50	0.00384	0.00330
55	0.00591	0.00442
60	0.00808	0.00530
65	0.00942	0.00546
70	0.01022	0.00546



Appendix C – Statement of Actuarial Assumptions (continued)

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

Top 10 non-LEO Termination Rates, Male											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	≥10
20	0.25392	0.22206	0.20116	0.18762	0.17764	0.15808	0.12342	0.09285	0.08232	0.06883	0.06883
25	0.23300	0.20505	0.18626	0.17319	0.16251	0.14426	0.11711	0.09285	0.08232	0.06883	0.06883
30	0.20800	0.18397	0.16688	0.15379	0.14187	0.12620	0.10926	0.09285	0.08232	0.06883	0.06883
35	0.19131	0.16822	0.15078	0.13689	0.12397	0.11188	0.10157	0.09215	0.08232	0.06883	0.05224
40	0.17894	0.15565	0.13702	0.12181	0.10776	0.09960	0.09363	0.08862	0.08132	0.06779	0.04307
45	0.16933	0.14546	0.12562	0.10920	0.09444	0.08921	0.08524	0.08181	0.07546	0.06301	0.03941
50	0.16162	0.13610	0.11524	0.09886	0.08586	0.08049	0.07627	0.07170	0.06439	0.05476	0.03941
55	0.15609	0.12538	0.10330	0.08976	0.08448	0.07339	0.06690	0.05864	0.04833	0.04320	0.03941
60	0.15353	0.11112	0.08689	0.08055	0.08055	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.15343	0.09244	0.06477	0.06477	0.06477	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.15343	0.06515	0.03176	0.03176	0.03176	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Top 10 non-LEO Termination Rates, Female											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	≥10
20	0.23553	0.21693	0.20665	0.20440	0.20440	0.20440	0.19895	0.17588	0.14347	0.14347	0.14347
25	0.22847	0.20860	0.19802	0.19425	0.19257	0.18886	0.17958	0.15784	0.13041	0.13041	0.13041
30	0.22192	0.19894	0.18647	0.17978	0.17463	0.16606	0.15276	0.13313	0.11268	0.10449	0.10449
35	0.21392	0.18767	0.17208	0.16238	0.15439	0.14424	0.13001	0.11315	0.09792	0.08502	0.07338
40	0.20339	0.17376	0.15476	0.14236	0.13212	0.12260	0.10939	0.09565	0.08451	0.07002	0.04165
45	0.19067	0.15747	0.13540	0.12135	0.11040	0.10262	0.09177	0.08099	0.07250	0.06008	0.03671
50	0.17898	0.14101	0.11606	0.10164	0.09263	0.08548	0.07824	0.07059	0.06260	0.05556	0.03671
55	0.17295	0.12753	0.09920	0.08541	0.08214	0.07159	0.06952	0.06590	0.05564	0.05536	0.03671
60	0.17275	0.11948	0.08699	0.07432	0.07432	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.17275	0.11784	0.08108	0.06923	0.06923	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.17275	0.11784	0.08083	0.06904	0.06904	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Appendix C – Statement of Actuarial Assumptions (continued)

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

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.



Appendix C – Statement of Actuarial Assumptions (continued)

LOCALS – NON-TOP 10, NON-LEO

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 95% of rates; females 105% of rates

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 3 years; females 1.0% increase compounded from ages 70 to 90

Post-Disablement:

RP-2014 Disabled Mortality Rates projected with scale BB to 2020; males set forward 2 years, 110% of rates; females 125% of rates

Non-Top 10 non-LEO Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00038	0.00050	0.00923	0.00017	0.00016	0.00274
25	0.00045	0.00044	0.00850	0.00018	0.00017	0.00293
30	0.00042	0.00048	0.00902	0.00023	0.00021	0.00369
35	0.00049	0.00056	0.01042	0.00030	0.00028	0.00484
40	0.00059	0.00078	0.01372	0.00041	0.00039	0.00670
45	0.00091	0.00133	0.01991	0.00068	0.00065	0.01111
50	0.00157	0.00495	0.02336	0.00114	0.00272	0.01462
55	0.00260	0.00667	0.02637	0.00171	0.00352	0.01756
60	0.00427	0.00894	0.02950	0.00241	0.00489	0.02001
65	0.00731	0.01285	0.03501	0.00361	0.00749	0.02425
70	0.01202	0.02021	0.04538	0.00616	0.01209	0.03279
75		0.03312	0.06223		0.02067	0.04772
80		0.05662	0.08955		0.03616	0.07096
85		0.10039	0.13529		0.06599	0.10513
90		0.17537	0.21057		0.12354	0.15517

20% 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



Appendix C – Statement of Actuarial Assumptions (continued)

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

Non-Top 10 non-LEO Retirement Rates, Plan 1 Male with 50/30 eligibility							
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
50.00	0.000	0.000	0.000	0.050	0.050	0.100	0.100
51.00	0.000	0.000	0.000	0.055	0.040	0.100	0.080
52.00	0.000	0.000	0.000	0.055	0.040	0.100	0.080
53.00	0.000	0.000	0.000	0.055	0.040	0.100	0.080
54.00	0.000	0.000	0.000	0.055	0.040	0.100	0.100
55.00	0.000	0.055	0.055	0.055	0.050	0.140	0.100
56.00	0.000	0.055	0.050	0.050	0.050	0.140	0.100
57.00	0.000	0.090	0.055	0.055	0.055	0.110	0.100
58.00	0.000	0.090	0.055	0.055	0.055	0.110	0.100
59.00	0.000	0.100	0.055	0.055	0.055	0.120	0.100
60.00	0.000	0.100	0.060	0.060	0.060	0.120	0.100
61.00	0.000	0.150	0.100	0.100	0.100	0.250	0.220
62.00	0.000	0.130	0.170	0.170	0.170	0.350	0.300
63.00	0.000	0.130	0.150	0.150	0.150	0.200	0.250
64.00	0.000	0.200	0.150	0.150	0.150	0.270	0.250
65.00	0.000	0.270	0.270	0.270	0.270	0.270	0.300
66.00	0.000	0.270	0.300	0.300	0.300	0.300	0.300
67.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
68.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
69.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
70.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
71.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
72.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
73.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
74.00	0.000	0.270	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



Appendix C – Statement of Actuarial Assumptions (continued)

Non-Top 10 non-LEO Retirement Rates, Plan 1 Female with 50/30 eligibility							
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
50.00	0.000	0.000	0.000	0.055	0.055	0.060	0.060
51.00	0.000	0.000	0.000	0.055	0.040	0.060	0.100
52.00	0.000	0.000	0.000	0.055	0.045	0.060	0.100
53.00	0.000	0.000	0.000	0.055	0.045	0.120	0.100
54.00	0.000	0.000	0.000	0.055	0.045	0.120	0.100
55.00	0.000	0.070	0.070	0.070	0.055	0.120	0.100
56.00	0.000	0.060	0.055	0.055	0.055	0.120	0.100
57.00	0.000	0.060	0.055	0.055	0.055	0.100	0.100
58.00	0.000	0.060	0.055	0.055	0.055	0.100	0.100
59.00	0.000	0.060	0.055	0.055	0.055	0.150	0.100
60.00	0.000	0.085	0.075	0.075	0.075	0.150	0.100
61.00	0.000	0.085	0.075	0.075	0.075	0.200	0.175
62.00	0.000	0.190	0.170	0.170	0.170	0.200	0.250
63.00	0.000	0.110	0.150	0.150	0.150	0.200	0.250
64.00	0.000	0.110	0.150	0.150	0.150	0.250	0.150
65.00	0.000	0.280	0.280	0.280	0.280	0.280	0.350
66.00	0.000	0.280	0.300	0.300	0.300	0.300	0.300
67.00	0.000	0.175	0.220	0.220	0.220	0.220	0.220
68.00	0.000	0.175	0.220	0.220	0.220	0.220	0.220
69.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
70.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
71.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
72.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
73.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
74.00	0.000	0.300	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



Appendix C – Statement of Actuarial Assumptions (continued)

Non-Top 10 non-LEO Retirement Rates, Plan 1 Male with 55/30 eligibility							
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
50.00	0.000	0.000	0.000	0.050	0.050	0.050	0.050
51.00	0.000	0.000	0.000	0.055	0.040	0.040	0.040
52.00	0.000	0.000	0.000	0.055	0.040	0.040	0.040
53.00	0.000	0.000	0.000	0.055	0.040	0.040	0.040
54.00	0.000	0.000	0.000	0.055	0.040	0.040	0.040
55.00	0.000	0.055	0.055	0.055	0.050	0.140	0.140
56.00	0.000	0.055	0.050	0.050	0.050	0.140	0.100
57.00	0.000	0.090	0.055	0.055	0.055	0.110	0.100
58.00	0.000	0.090	0.055	0.055	0.055	0.110	0.100
59.00	0.000	0.100	0.055	0.055	0.055	0.120	0.100
60.00	0.000	0.100	0.060	0.060	0.060	0.120	0.100
61.00	0.000	0.150	0.100	0.100	0.100	0.250	0.220
62.00	0.000	0.130	0.170	0.170	0.170	0.350	0.300
63.00	0.000	0.130	0.150	0.150	0.150	0.200	0.250
64.00	0.000	0.200	0.150	0.150	0.150	0.270	0.250
65.00	0.000	0.270	0.270	0.270	0.270	0.270	0.300
66.00	0.000	0.270	0.300	0.300	0.300	0.300	0.300
67.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
68.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
69.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
70.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
71.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
72.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
73.00	0.000	0.270	0.250	0.250	0.250	0.250	0.250
74.00	0.000	0.270	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



Appendix C – Statement of Actuarial Assumptions (continued)

Non-Top 10 non-LEO Retirement Rates, Plan 1 Female with 55/30 eligibility							
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
50.00	0.000	0.000	0.000	0.055	0.055	0.055	0.055
51.00	0.000	0.000	0.000	0.055	0.040	0.040	0.040
52.00	0.000	0.000	0.000	0.055	0.045	0.045	0.045
53.00	0.000	0.000	0.000	0.055	0.045	0.045	0.045
54.00	0.000	0.000	0.000	0.055	0.045	0.045	0.045
55.00	0.000	0.070	0.070	0.070	0.055	0.120	0.120
56.00	0.000	0.060	0.055	0.055	0.055	0.120	0.100
57.00	0.000	0.060	0.055	0.055	0.055	0.100	0.100
58.00	0.000	0.060	0.055	0.055	0.055	0.100	0.100
59.00	0.000	0.060	0.055	0.055	0.055	0.150	0.100
60.00	0.000	0.085	0.075	0.075	0.075	0.150	0.100
61.00	0.000	0.085	0.075	0.075	0.075	0.200	0.175
62.00	0.000	0.190	0.170	0.170	0.170	0.200	0.250
63.00	0.000	0.110	0.150	0.150	0.150	0.200	0.250
64.00	0.000	0.110	0.150	0.150	0.150	0.250	0.150
65.00	0.000	0.280	0.280	0.280	0.280	0.280	0.350
66.00	0.000	0.280	0.300	0.300	0.300	0.300	0.300
67.00	0.000	0.175	0.220	0.220	0.220	0.220	0.220
68.00	0.000	0.175	0.220	0.220	0.220	0.220	0.220
69.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
70.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
71.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
72.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
73.00	0.000	0.300	0.220	0.220	0.220	0.220	0.220
74.00	0.000	0.300	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



Appendix C – Statement of Actuarial Assumptions (continued)

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

Non-Top 10 non-LEO Retirement Rates, Plan 2/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	0.100
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	0.100	0.100
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.080
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.080	0.080
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.100	0.100	0.100
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.140	0.140	0.100	0.100	0.100	0.100
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.140	0.140	0.100	0.100	0.100	0.100	0.100
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110	0.110	0.100	0.100	0.100	0.100	0.100	0.100
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110	0.110	0.100	0.100	0.100	0.100	0.100	0.100	0.100
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120	0.120	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
60	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.120	0.120	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
61	0.000	0.150	0.100	0.100	0.100	0.100	0.250	0.250	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
62	0.000	0.130	0.170	0.170	0.170	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	0.130	0.150	0.150	0.200	0.200	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
64	0.000	0.200	0.150	0.270	0.270	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	0.270	0.270	0.270	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	0.270	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	0.270	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	0.270	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	0.270	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	0.270	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	0.270	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	0.270	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	0.270	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	0.270	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



Appendix C – Statement of Actuarial Assumptions (continued)

Non-Top 10 non-LEO Retirement Rates, Plan 2/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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	0.060
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	0.060	0.060
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	0.060	0.060	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	0.120	0.120	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	0.120	0.120	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	0.120	0.120	0.100	0.100	0.100	0.100
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120	0.120	0.100	0.100	0.100	0.100	0.100
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.150	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
60	0.000	0.085	0.085	0.085	0.085	0.085	0.085	0.150	0.150	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
61	0.000	0.085	0.075	0.075	0.075	0.075	0.200	0.200	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
62	0.000	0.190	0.170	0.170	0.170	0.200	0.200	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
63	0.000	0.110	0.150	0.150	0.200	0.200	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
64	0.000	0.110	0.150	0.250	0.250	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
65	0.000	0.280	0.280	0.280	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	0.280	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	0.175	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	0.175	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	0.300	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	0.300	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	0.300	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	0.300	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	0.300	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	0.300	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



Appendix C – Statement of Actuarial Assumptions (continued)

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

Non-Top 10 non-LEO Disability Rates		
Age	Male	Female
20	0.00005	0.00001
25	0.00009	0.00001
30	0.00022	0.00001
35	0.00052	0.00024
40	0.00130	0.00058
45	0.00271	0.00127
50	0.00429	0.00274
55	0.00585	0.00483
60	0.00656	0.00640
65	0.00656	0.00656
70	0.00656	0.00656



Appendix C – Statement of Actuarial Assumptions (continued)

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

Non-Top 10 non-LEO Termination Rates, Male											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	≥10
20	0.27688	0.25244	0.22872	0.20056	0.16855	0.14057	0.12603	0.11320	0.10411	0.10411	0.10411
25	0.25057	0.23024	0.20925	0.18373	0.15688	0.13361	0.11957	0.10835	0.09992	0.09992	0.09992
30	0.22157	0.20258	0.18350	0.16156	0.14147	0.12425	0.11142	0.10236	0.09459	0.08978	0.08978
35	0.20650	0.18223	0.16214	0.14313	0.12751	0.11426	0.10347	0.09571	0.08813	0.07795	0.06549
40	0.19553	0.16457	0.14299	0.12680	0.11490	0.10504	0.09615	0.08848	0.08079	0.06770	0.04626
45	0.18397	0.14896	0.12718	0.11399	0.10572	0.09878	0.09085	0.08205	0.07363	0.06227	0.04626
50	0.17144	0.13660	0.12001	0.10648	0.10447	0.09747	0.08930	0.08111	0.06806	0.06227	0.04626
55	0.16068	0.12967	0.12001	0.10500	0.10447	0.09747	0.08930	0.08111	0.06486	0.06227	0.04626
60	0.15449	0.12875	0.12001	0.10500	0.10447	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.15356	0.12875	0.12001	0.10500	0.10447	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.15356	0.12875	0.12001	0.10500	0.10447	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Non-Top 10 non-LEO Termination Rates, Female											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	≥10
20	0.30069	0.27981	0.24957	0.21230	0.17722	0.15634	0.13998	0.12034	0.10656	0.10656	0.10656
25	0.27370	0.25711	0.23395	0.20379	0.17488	0.15451	0.13809	0.12034	0.10656	0.10642	0.10642
30	0.24251	0.22690	0.21116	0.19063	0.17074	0.15276	0.13578	0.12002	0.10656	0.09928	0.09928
35	0.22330	0.20208	0.18736	0.17235	0.15849	0.14347	0.12837	0.11557	0.10447	0.09116	0.07607
40	0.20843	0.18156	0.16471	0.15164	0.14138	0.13004	0.11766	0.10682	0.09812	0.08252	0.05323
45	0.19506	0.16555	0.14581	0.13206	0.12281	0.11551	0.10655	0.09714	0.08999	0.07643	0.05323
50	0.18178	0.15325	0.13203	0.11702	0.10714	0.10278	0.09905	0.09359	0.08483	0.07560	0.05323
55	0.16934	0.14490	0.12446	0.10933	0.10007	0.09284	0.09284	0.09284	0.08445	0.07560	0.05323
60	0.16029	0.14080	0.12292	0.10875	0.10007	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.15628	0.14008	0.12292	0.10875	0.10007	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.15619	0.14008	0.12292	0.10875	0.10007	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Appendix C – Statement of Actuarial Assumptions (continued)

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

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.



Appendix C – Statement of Actuarial Assumptions (continued)

LOCALS – TOP 10, LEO

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, 1% 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

Top 10 LEO 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

70% 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.



Appendix C – Statement of Actuarial Assumptions (continued)

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

Top 10 LEO 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	0.070	0.070	0.260	0.260
51	0.000	0.070	0.060	0.150	0.205
52	0.000	0.070	0.060	0.150	0.205
53	0.000	0.070	0.060	0.150	0.205
54	0.000	0.070	0.060	0.150	0.205
55	0.000	0.070	0.060	0.150	0.205
56	0.000	0.070	0.060	0.210	0.205
57	0.000	0.070	0.060	0.210	0.205
58	0.000	0.070	0.060	0.210	0.205
59	0.000	0.070	0.125	0.320	0.275
60	0.000	0.210	0.210	0.210	0.275
61	0.000	0.375	0.275	0.275	0.275
62	0.000	0.500	0.320	0.320	0.320
63	0.000	0.500	0.320	0.320	0.320
64	0.000	0.500	0.400	0.400	0.400
>=65	0.000	1.000	1.000	1.000	1.000



Appendix C – Statement of Actuarial Assumptions (continued)

Top 10 LEO 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	0.050	0.050	0.320	0.320
51	0.000	0.050	0.088	0.250	0.200
52	0.000	0.050	0.075	0.250	0.200
53	0.000	0.050	0.075	0.250	0.275
54	0.000	0.050	0.075	0.250	0.275
55	0.000	0.050	0.075	0.250	0.210
56	0.000	0.050	0.140	0.250	0.210
57	0.000	0.050	0.140	0.250	0.210
58	0.000	0.050	0.140	0.250	0.210
59	0.000	0.050	0.140	0.250	0.400
60	0.000	0.200	0.200	0.200	0.400
61	0.000	0.200	0.200	0.200	0.200
62	0.000	0.200	0.350	0.350	0.350
63	0.000	0.200	0.300	0.300	0.300
64	0.000	0.200	0.300	0.300	0.300
>=65	0.000	1.000	1.000	1.000	1.000



Appendix C – Statement of Actuarial Assumptions (continued)

DISABILITY RATES: As shown below for selected ages. 70% of disability cases are assumed to be service related.

Top 10 LEO Disability Rates		
Age	Male	Female
20	0.00019	0.00012
25	0.00022	0.00248
30	0.00052	0.00558
35	0.00133	0.00705
40	0.00267	0.00794
45	0.00405	0.00906
50	0.00500	0.01090
55	0.00657	0.01376
60	0.01055	0.01788
65	0.01786	0.02327
70	0.03085	0.03105

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

Top 10 LEO Termination Rates		
Service	Male	Female
0	0.10000	0.15000
1	0.08500	0.09000
2	0.08000	0.09000
3	0.07500	0.09000
4	0.05500	0.09000
5	0.05000	0.09000
6	0.04750	0.09000
7	0.04500	0.06000
8	0.04000	0.03500
9	0.03000	0.02000
>=10	0.01800	0.02000



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix C – Statement of Actuarial Assumptions (continued)

LOCALS – NON-TOP 10, LEO

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, 1% 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

Non-Top 10 LEO 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

45% 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.



Appendix C – Statement of Actuarial Assumptions (continued)

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

Non-Top 10 LEO 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	0.090	0.090	0.275	0.275
51	0.000	0.090	0.075	0.275	0.150
52	0.000	0.090	0.075	0.200	0.150
53	0.000	0.090	0.075	0.200	0.150
54	0.000	0.090	0.075	0.200	0.150
55	0.000	0.090	0.075	0.200	0.180
56	0.000	0.090	0.075	0.200	0.165
57	0.000	0.090	0.075	0.200	0.165
58	0.000	0.090	0.080	0.200	0.165
59	0.000	0.090	0.120	0.200	0.240
60	0.000	0.150	0.150	0.150	0.275
61	0.000	0.150	0.275	0.275	0.275
62	0.000	0.150	0.275	0.275	0.275
63	0.000	0.250	0.300	0.300	0.300
64	0.000	0.200	0.300	0.300	0.300
>=65	0.000	1.000	1.000	1.000	1.000



Appendix C – Statement of Actuarial Assumptions (continued)

Non-Top 10 LEO 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	0.093	0.093	0.500	0.500
51	0.000	0.125	0.090	0.200	0.150
52	0.000	0.125	0.090	0.200	0.150
53	0.000	0.125	0.090	0.200	0.150
54	0.000	0.125	0.090	0.200	0.150
55	0.000	0.125	0.090	0.200	0.180
56	0.000	0.125	0.090	0.200	0.165
57	0.000	0.125	0.090	0.200	0.165
58	0.000	0.125	0.090	0.200	0.165
59	0.000	0.125	0.090	0.200	0.240
60	0.000	0.200	0.200	0.200	0.275
61	0.000	0.200	0.275	0.275	0.275
62	0.000	0.200	0.275	0.275	0.275
63	0.000	0.200	0.300	0.300	0.300
64	0.000	0.200	0.300	0.300	0.300
>=65	0.000	1.000	1.000	1.000	1.000



Appendix C – Statement of Actuarial Assumptions (continued)

DISABILITY RATES: As shown below for selected ages. 45% of disability cases are assumed to be service related.

Non-Top 10 LEO Disability Rates		
Age	Male	Female
20	0.00001	0.00005
25	0.00016	0.00067
30	0.00058	0.00157
35	0.00121	0.00189
40	0.00218	0.00201
45	0.00330	0.00244
50	0.00416	0.00413
55	0.00496	0.00831
60	0.00575	0.01605
65	0.00630	0.02747
70	0.00659	0.04509



Appendix C – Statement of Actuarial Assumptions (continued)

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

Non-Top 10 LEO Termination Rates, Male											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	≥10
20	0.16820	0.15769	0.15265	0.14807	0.13578	0.11182	0.08845	0.07768	0.06899	0.06899	0.06899
25	0.16006	0.14519	0.13807	0.13247	0.12169	0.10519	0.08845	0.07768	0.06899	0.06899	0.06899
30	0.15408	0.13212	0.12044	0.11255	0.10382	0.09687	0.08803	0.07768	0.06849	0.06237	0.05800
35	0.15310	0.12574	0.10924	0.09896	0.09156	0.08897	0.08437	0.07640	0.06609	0.05433	0.04189
40	0.15357	0.12180	0.10118	0.08908	0.08281	0.08025	0.07719	0.07142	0.06199	0.04868	0.03220
45	0.15275	0.11790	0.09478	0.08223	0.07802	0.07022	0.06634	0.06269	0.05626	0.04561	0.03022
50	0.14879	0.11257	0.08908	0.07811	0.07733	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.14065	0.10547	0.08414	0.07694	0.07694	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.12791	0.09675	0.08028	0.07694	0.07694	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.11088	0.08665	0.07763	0.07694	0.07694	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.08616	0.07353	0.07353	0.07353	0.07353	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Non-Top 10 LEO Termination Rates, Female											
Age	Years of Service										
	0	1	2	3	4	5	6	7	8	9	≥10
20	0.17536	0.15011	0.12899	0.11652	0.11390	0.11329	0.11233	0.09556	0.06591	0.05831	0.05831
25	0.18762	0.15474	0.13049	0.11598	0.11001	0.10648	0.10224	0.08766	0.06591	0.05831	0.05831
30	0.20549	0.16296	0.13433	0.11683	0.10644	0.09874	0.09030	0.07873	0.06591	0.05831	0.05762
35	0.20886	0.16395	0.13402	0.11544	0.10335	0.09327	0.08334	0.07404	0.06591	0.05831	0.05043
40	0.20126	0.15881	0.13026	0.11258	0.10087	0.08968	0.08014	0.07253	0.06591	0.05763	0.04252
45	0.18253	0.14688	0.12276	0.10843	0.09904	0.08818	0.07992	0.07253	0.06587	0.05314	0.03443
50	0.15288	0.12797	0.11154	0.10319	0.09757	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55	0.11234	0.10212	0.09680	0.09680	0.09599	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.06089	0.06935	0.06935	0.06935	0.06935	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65	0.01269	0.03040	0.03040	0.03040	0.03040	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.01269	0.01185	0.01185	0.01185	0.01185	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Appendix C – Statement of Actuarial Assumptions (continued)

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



Appendix D – Actuarial Cost Method

The valuation is prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable at retirement, disability or death. The calculations are based on the member's age, years of service, sex, compensation, expected future salary increases, and an assumed future investment rate of return. The calculations consider the probability of a member's death or termination of employment prior to becoming eligible for a benefit and the probability of the member terminating with a service, disability, or survivor's benefit. The present value of the expected benefits payable to active members is added to the present value of the expected future payments to current benefit recipients to obtain the present value of all expected benefits payable to the present group of members and survivors.

The employer contributions required to support the benefits of the Plan are determined following a level funding approach, and consist of a normal contribution and an actuarial accrued liability contribution.

The actuarial accrued liability is determined using the "entry age normal" method. Under this method, the accrued liability is the difference between the present value of expected future benefit payments payable, as described above, and the present value of expected future normal cost, as described below.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for OPEB benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.