



Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve



Virginia
Retirement
System

**Report on the Actuarial Valuation of the
Line of Duty Act Fund**

Prepared as of June 30, 2016





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

December 20, 2016

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

Dear Trustees:

Governmental Accounting Standards Board Statements No. 43 and No. 45 (GASB 43 and 45) require actuarial valuations of retiree health care and other postemployment benefit (OPEB) plans. Cavanaugh Macdonald Consulting, LLC (CMC) is submitting the results of the annual actuarial valuation of the Virginia Retirement System (VRS) Line of Duty Act Fund (Plan) prepared as of June 30, 2016.

CMC has relied on the plan provisions and eligibility provisions of the Commonwealth of Virginia's Line of Duty Program (LODA Program) provided by §9.1-400 et seq. of the Virginia Code (Code), including changes resulting from the passage of House Bill 1345 (HB 1345), and Item 269 of the 2016 Appropriations Act (the Act). Additionally, CMC has received active participant data from the Virginia Retirement System (VRS) and inactive data provided by the Commonwealth of Virginia Departments of Accounts (DOA). CMC has reviewed the data for reasonableness only, and has not performed a formal audit of the data used for this valuation. Because the census data was collected from a wide range of sources with varying and, at times, limited content, the data is incomplete. Adjustments have been made to account for this incompleteness. Along with the valuation results, commentary is provided regarding the various aspects of developing the cost structure for LODA Program benefits to be financed through the Plan.

The valuation results are provided on a blended, single group cost basis. In the first projection year, health care benefits are not uniform amongst Plan beneficiaries, where costs are comprised of two individual segments of the total population: State Employees and Political Subdivision Employees. State Employees include State Employees, Virginia Law Officers (VaLORS), State Police (SPORS), Department of Motor Vehicle Employees (DMV), and the National Guard. Political Subdivision Employees include Emergency Medical Technicians (EMT), Fire personnel, participating Political Subdivisions within VRS, as well as one retirement system independent of VRS. Beyond the first projection year, health care benefits were assumed to be uniform amongst Plan beneficiaries to reflect the changes brought about by the passage of HB 1345. Here, the assumed health care costs were based upon the adjusted experience of those State Employees currently receiving health care benefits from the Plan. As such, the valuation results are based upon high-level assumptions and estimates that are likely to change as details regarding the LODA Health Benefits Plans emerge.

Projections estimate annual Full-Time Equivalent (FTE) employee contributions for the fiscal year 2018 to be \$564.48. The estimated contribution rates assume Plan participation of 11,574.10 State Employee FTEs and 7,430.50 Political Subdivision Employee FTEs, for a total of 19,004.60 FTEs. The contribution rate of \$564.48 represents, in total, the estimated cost of providing benefits payable in fiscal year 2018, including administrative expenses, the cost of benefits incurred and reported to the administrator but awaiting processing (additional reserves). Contribution rates for participating employer groups are established every two years. Based upon the June 30, 2015 valuation results, the Board approved rate for fiscal years 2017 and 2018 is \$567.37. The results of the June 30, 2016 valuation are for informational purposes only.



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's administrator may want to consider this potential risk in regards to its authority to waive the five-year statute of limitation on claims.

The promised death benefits and postemployment health care benefits provided through the Plan are included in all of the actuarially estimated contribution rates. The Plan is a cost-sharing, multiple-employer plan, and the liability for the Plan is developed and reported, as a whole, under the requirements of GASB Statement No. 43. The measurement of the cost-sharing employers' OPEB expense and liabilities under GASB Statement No. 45 is based upon employers' contractually required contributions to the Plan. The actuarially calculated contribution rates based upon the requirements of GASB 43 and 45 were developed using the entry age normal cost method with projected benefits. As the Act requires contributions to be determined on a current disbursement basis; the Plan has minimal assets in trust solely to provide benefits; and GASB 43 and 45 requires the discount rate used to value a plan to be based on the likely return of the assets used to pay benefits; the GASB 43 and 45 valuation results provided in this report reflect a discount rate of 4.75%. The assumed annual rate of return of 4.75% is assumed to be consistent with the long-term rate of return for Virginia's Local Government Investment Pool (LGIP). As the discount rate used for determining liabilities is based on the expected return on assets, the liability amounts in this report cannot be used to assess a settlement of the obligation. The unfunded accrued liability is being amortized by regular annual contributions as a level percentage of payroll within a 30-year period, on the assumption that payroll will increase by 3.00% annually. The assumptions recommended by the actuary are in the aggregate reasonably related to the experience under the Plan and to reasonable expectations of anticipated experience under the Plan and meet the parameters for the disclosures under GASB 43 and 45.

The valuation reflects changes in the actuarial assumptions and methods used in the prior study, including a change in the actuarial cost method; changes in costs, benefits, and eligibility resulting from the passage of HB 1345; adjustments to the percentage of death benefit payments made as a direct or proximate result of the performance of duty; revisions to the assumed per capita health care costs; and updates to the assumed rates of health care inflation.

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

This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with the Actuarial Standards of Practice issued by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Plan and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of VRS.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: potential variance in the number and/or type of covered lives, Plan experience differing from that anticipated by the economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in Plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.



The Board of Trustees
December 20, 2016
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The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Jose I. Fernandez', with a large, stylized flourish at the end.

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

A handwritten signature in blue ink, appearing to read 'Eric H. Gary', with a stylized flourish at the end.

Eric H. Gary, FSA, FCA, MAAA
Principal and Chief Health Actuary

JIF/EHG:bcn



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Section I – Summary of Principal Results

1. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below.

LINE OF DUTY ACT FUND

	June 30, 2016	June 30, 2015
Number FTE Employees	19,004.60	18,819.45
Number Receiving Benefits	<u>1,040.00</u>	<u>994.00</u>
Total	20,044.60	19,813.45
Assets:		
Market Value	\$ 1,899,905	\$ 695,351
Actuarial Value	\$ 1,899,905	\$ 695,351
Unfunded Actuarial Accrued Liability	\$222,782,549	\$245,112,449
Amortization Period (Years)		
Accrued Liability	30	30
Annual Required Contribution (ARC):		
Normal Cost*	\$ 12,945,744	\$ 12,948,346
Accrued Liability	<u>9,381,051</u>	<u>10,321,151</u>
Total ARC	\$ 22,326,795	\$ 23,269,497
Contribution Per FTE Employee		
Normal Cost	\$ 643.67	\$ 662.72
Administrative Expenses	25.18	14.98
Additional Reserves	<u>12.34</u>	<u>10.33</u>
Total Adjusted Normal Cost	\$ 681.19	\$ 688.03
Accrued Liability	<u>493.62</u>	<u>548.43</u>
Total ARC	\$ 1,174.81	\$ 1,236.46
Expected Benefits Paid**:		
Total	\$ 10,239,108	\$ 9,239,974
Per FTE Employee	\$ 538.77	\$ 490.98
Discount Rate	4.75%	4.75%

* Includes administrative expenses and additional reserves.

** Excludes administrative expenses and additional reserves.



Section I – Summary of Principal Results (continued)

2. Results are based upon a blended, single group cost basis and the demographic assumptions specific to each employer group. Please refer to Schedule C for additional detail regarding the full set of actuarial assumptions used in the valuation.
3. The valuation as of June 30, 2016 indicates that the Annual Required Contribution (ARC) under GASB 43 and 45 is \$1,174.81 per FTE employee payable for the fiscal year ending June 30, 2016. Comments on the valuation results as of June 30, 2016 are given in Section IV.
4. The cost of the lump-sum death benefit for members who die in active service (payment for death occurring as a direct or proximate result of the performance of duty, or by presumptive clause, if still actively employed by a participating employer at the time of death) is payable by the Plan and is included in the actuarial valuation. The liability for the lump-sum benefit paid for death in active service could be segregated from the GASB 43 and 45 OPEB liability and assets could be split for active and post-employment purposes. As this may be administratively burdensome, VRS may desire to treat the Plan's entire liability as an OPEB liability under GASB 43 and 45 for funding and/or accounting purposes.
5. Schedule C and Schedule D of this report outlines the full set of actuarial assumptions and the actuarial cost method used in the current valuation. For this purpose, participants have been divided into five groups: VRS State Employees, VRS VaLORS, VRS SPORS, Group A, and Group B. Group A consists of the following VRS political subdivisions: City of Virginia Beach, City of Chesapeake, and the City of Portsmouth. Group B consists of all remaining employer groups, including the National Guard.
6. The main provisions of the Plan, as summarized in Schedule E, were taken into account in the current valuation. In accordance with the passage of HB 1345, the June 30, 2016 valuation considers, effective with the second projection year, the following changes:
 - Change in health care cost basis by estimating the health care costs of the LODA Health Benefit Plans that are to be created to provide health care benefits to all LODA Program beneficiaries.
 - Changes in LODA Program and Plan administration by estimating the administrative expenses of VRS as the administrator of the Line of Duty Death and Health Benefits Trust Fund.



Section I – Summary of Principal Results (continued)

- Change in benefits for Plan beneficiaries who become eligible for health care benefits as the result of a death or disability occurring after June 30, 2017, where the health care benefits of disabled employees and covered spouses/surviving spouses are discontinued, if a beneficiary is eligible for Medicare due to age (generally age 65).

Changes associated with HB 1345 that were not considered in the June 30, 2016 valuation include:

- 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.
- 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.

7. The valuation reflects changes in the actuarial assumptions and methods used in the prior study, including:

- A change in the actuarial cost method, moving from Entry Age Normal (Level Dollar) to Entry Age Normal (Level Percent of Pay).
- Adjustments to the percentage of death benefit payments made as a direct or proximate result of the performance of duty
- Revisions to the assumed per capita health care costs
- Updates to the assumed rates of health care inflation.



Section II – Membership Data

1. Data regarding the membership of the Plan for use as a basis of the valuation were furnished by VRS.

VRS collected active Plan participant data for the following participating employer groups:

- Virginia Law Enforcement Officers Retirement System (VaLORS)
- State Police Officers Retirement System (SPORS)
- Virginia State Lottery
- Virginia Department of Conservation and Recreation
- Virginia Department of Forestry
- Virginia Department of Motor Vehicles
- Virginia Department of Emergency Management
- Virginia Air National Guard
- Virginia Army National Guard
- Virginia Port Authority
- Fire companies or departments that provide fire protection services to Virginia National Guard or Virginia Air National Guard facilities
- VRS Local Employers' Law Enforcement Officers of participating political subdivisions
- VRS Local Employers' members performing hazardous duties for participating political subdivisions
- Arlington County (retirement system independent from VRS)
- Law Enforcement, Firefighters, and EMTs of associated participating political subdivisions

2. For the eligible full-time equivalent employee estimate, various employee types are assumed to represent a fraction of a full-time employee.



Section II – Membership Data (continued)

3. The number of unique active lives used in the valuation and the estimate of covered lives is provided in the following table:

THE NUMBER OF ACTIVE LIVES AS OF JUNE 30, 2016

Group	Number	Weight	FTE Employees	Estimated Contributions*
State/VaLORS/SPORS	10,147	100%	10,147.00	\$5,757,103
National Guard				
Full-Time	654	100%	1,427.10	\$ 809,694
Part-Time	7,731	10%		
<i>State Employees</i>	<i>18,532</i>		<i>11,574.10</i>	<i>\$6,566,797</i>
Participating Political Subdivisions				
Full-Time	6,753	100%	6,753.00	\$3,831,450
Volunteer	2,710	25%	677.50	\$ 384,393
<i>Political Subdivision Employees</i>	<i>9,463</i>		<i>7,430.50</i>	<i>\$4,215,843</i>
Total	27,995		19,004.60	\$10,782,640

*FY 2017 contribution rate of \$567.37 per FTE employee based upon June 30, 2015 estimated headcount of 18,819

Based upon 27,995 total lives, the valuation provides results for a group comprised of 19,004.60 FTE employees.

Schedule F shows the distribution by age and service of the number of active lives included in the valuation.



Section II – Membership Data (continued)

- 4. The following table shows the number of current health care beneficiaries identified as of June 30, 2016 and for the prior valuation date of June 30, 2015.

NUMBER OF HEALTH CARE BENEFICIARIES

AS OF JUNE 30, 2016			
Type	State	Political Subdivisions	Total
Disabled Participants	219	321	540
Spouses of Currently Disabled Participants	175	256	431
<u>Surviving Spouses</u>	<u>30</u>	<u>39</u>	<u>69</u>
Total	424	616	1,040

AS OF JUNE 30, 2015			
Type	State	Political Subdivisions	Total
Disabled Participants	221	297	518
Spouses of Currently Disabled Participants	175	237	412
<u>Surviving Spouses</u>	<u>27</u>	<u>37</u>	<u>64</u>
Total	423	571	994

As some beneficiaries elect to cover dependents, assumed adult per capita health care costs include the additional costs for the coverage of dependent children.

- 5. The following table shows a history of health care beneficiary valuation data from the Plan’s inception.

SCHEDULE OF HEALTH CARE BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS

Valuation Date	Health Care Beneficiaries					
	Number Added to Rolls	Annual Health Care Benefit Valued	Number Removed from Rolls	Annual Health Care Benefit Valued	Number on Rolls as of the Valuation Date	Annual Health Care Benefit Valued
6/30/2016	57	\$1,053,997	11	\$ 79,027	1,040	\$9,469,390
6/30/2015	70	1,091,255	12	104,397	994	8,494,420
6/30/2014	69	1,188,244	16	105,575	936	7,485,997
6/30/2013	128	1,069,073	66	448,046	883	6,403,328
6/30/2012	99	527,654	500	3,611,321	821	5,782,301
6/30/2011	128	1,230,701	117	845,499	1,222	8,865,969



Section III – Assets

As of June 30, 2016, \$1,899,905 is assumed to be held in a qualified trust solely to provide benefits to disabled employees and their beneficiaries in accordance with the terms of the Plan. Schedule B shows the additions and deductions of the Plan for the year preceding the valuation date and a reconciliation of the available fund balances at market value.



Section IV – Comments on Valuation

1. The June 30, 2016 valuation shows the Plan has prospective benefit liabilities to be paid on account of the present active membership of \$144,829,305. The prospective benefit liabilities for the Plan on account of benefits payable to current beneficiaries amounts to \$192,577,223. The total prospective benefit liabilities of the Plan amounts to \$337,406,528. Against these liabilities, the Plan has present assets of \$1,899,905 for valuation purposes. Therefore, the present value of contributions to be made in the future on account of benefits is \$335,506,623 for the Plan. Schedule A of this report outlines the results of the actuarial valuation.
2. The normal contribution is equal to the actuarial present value of benefits accruing during the current year, as well as the annual administrative expenses of the Plan, and the annual cost of benefits incurred and reported to the administrator but awaiting processing (additional reserves). The normal contribution for the Plan is determined to be \$12,945,744.
3. Prospective normal contributions have a present value of \$112,724,074. When this amount is subtracted from \$335,506,623, which is the present value of the total future contributions to be made by the employers, there remains \$222,782,549 as the amount of future accrued liability contributions.
4. An accrued liability contribution of \$9,381,051 is sufficient to liquidate the unfunded actuarial accrued liability over 30 years for the balance of the unfunded accrued liability, based on a 4.75% investment rate of return and the assumption that the payroll will increase by 3.00% annually.
5. The contributions for advance funding the Plan on account of benefits consist of normal contributions and accrued liability contributions. The resulting contribution is \$22,326,795. This amount is equivalent to an annual amount of \$1,174.81 per FTE employee.
6. The valuation was prepared in accordance with the actuarial assumptions and the actuarial cost method, which are described in Schedule C and Schedule D.
7. This valuation determines the cost of advance funding the post-retirement benefits under the Plan. The cost of lump-sum death benefits for members who die in active service is also included in the actuarial valuation.



Section V – Accounting Information

- GASB 43 and 45 set forth certain items of required supplementary information to be disclosed in the financial statements of VRS and the employer. One such item is a distribution of the number of members by type of membership, as follows:

**NUMBER OF ALL MEMBERS
AS OF JUNE 30, 2016**

Group	Count
Active Members (FTE Employees)	19,005
Disabled Members	540
Spouses of Disabled Members	431
Surviving Spouses	<u>69</u>
Total	20,045

- Another such item is the Schedule of Funding Progress, shown in the following table:

**SCHEDULE OF FUNDING PROGRESS
(\$ IN THOUSANDS)**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)* (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)
6/30/2016	\$ 1,900	\$224,683	\$ 222,783	0.85%
6/30/2015	696	245,808	245,112	0.28
6/30/2014	6,914	225,816	218,901	3.06
6/30/2013	10,084	204,084	194,000	4.94
6/30/2012	6,052	226,174	220,122	2.68
6/30/2011	0	398,956	398,956	0.00

*Actuarial cost method of Projected Unit Credit prior to 6/30/2013, Entry Age Normal (Level Dollar) for 6/30/2014 and 6/30/2015, and Entry Age Normal (Level Percent of Pay) thereafter.



Section V – Accounting Information (continued)

3. The information presented in the required supplementary schedules was determined as part of the actuarial valuation at June 30, 2016. Additional information as of the latest actuarial valuation follows:

Valuation Date	June 30, 2016
Actuarial Cost Method	Entry Age Normal
Amortization Method	
Accrued Liability	Level Percentage of Pay, Open
Payroll Growth Rate	3.00%
Remaining Amortization Period	
Accrued Liability	30 Years
Asset Valuation Method	Market Value of Assets
Actuarial Assumptions:	
Investment Rate of Return*	4.75%
*Includes Inflation at	2.50%
Medical Trend Assumption (Under Age 65)	7.75% - 5.00%
Medical Trend Assumption (Ages 65 and Older)	5.75% - 5.00%
Year of Ultimate Trend Rate	Fiscal Year Ended 2023

The assumed investment rate of return reflects the fact that the Plan is to be funded on a current disbursement basis.

4. On June 2, 2015, GASB Statement No. 74 and GASB Statement No. 75 (GASB 74 and 75) were unanimously adopted by the Governmental Accounting Standards Board. The disclosure requirements of GASB 74 and 75 will be similar to the disclosure requirements for pension benefits under GASB Statement No. 67 and GASB Statement No. 68. GASB 74 relates to accounting disclosures for plan sponsors and, as such, replaces GASB 43 beginning with fiscal years ending June 30, 2017. GASB 75 relates to accounting disclosures for contributing employers and, as such, replaces GASB 45 beginning with fiscal years ending June 30, 2018.

GASB 74 and 75 will require applicable OPEB plan sponsors and contributing employers to disclose the net OPEB liability on the statement of financial position and book an accounting expense based upon the entry age normal actuarial cost method. Beyond the use of a specified actuarial cost method, GASB's



Section V – Accounting Information (continued)

new disclosure standards will also require the discount rate used to calculate liabilities to be based upon the yield of 20-year, tax-exempt municipal bonds and the expected rate of return on plan assets, to the extent plan assets are projected to be available for the payment of future benefits. Additionally, GASB 74 and 75 will bring about many other changes in the liability valuation and accounting disclosure processes currently in place that are expected to significantly impact data collection, timing, and effort. As details for the new GASB OPEB disclosure standards emerge, planning and coordination between plan sponsors, contributing employers, actuaries, and auditors is recommended.

As noted above, GASB's new disclosure standards will require the discount rate used to calculate the liabilities of pay-as-you-go plans to be based upon the yield of 20-year, tax-exempt municipal bonds (rating AA/Aa or higher). As of June 30, 2016, the monthly average of the Bond Buyer General Obligation 20-year Municipal Bond Index (published weekly by the Board of Governors of the Federal Reserve System) was 3.01%, resulting in an AAL (known as the Total OPEB Liability, or TOL, under GASB 74 and 75) of \$281,053,518.



Section VI – Derivation of Experience Gains and Losses

**CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITIES (UAAL)
(\$ IN MILLIONS)**

Fiscal Year Ended 2016		
1.	Beginning of Year:	
(a)	Actuarial Accrued Liability (AAL)	\$ 245.8
(b)	Normal Cost	\$ 12.9
(c)	Benefit Payments	\$ 8.7
2.	End of Year:	
(a)	Expected AAL $[(1a) + (1b)] \times 1.0475 - [(1c) \times (1 + [0.0475 \times 0.50])]$	\$ 262.1
(b)	(Gains) or Losses	
	Expected vs. Actual Experience	\$ 9.1
	Changes of Assumptions (prior to benefit changes)	8.3
	Changes of Benefit Terms	(27.0)
	Change in Cost Method	<u>(27.8)</u>
	Total	\$ (37.4)
3.	End of Year AAL <i>(2a) + (2b)</i>	\$ 224.7
4.	Beginning of Year Actuarial Value of Assets (AVA)	\$ 0.7
5.	Net External Cash Flow During the Year	\$ 1.1
6.	End of Year:	
(a)	Expected AVA $[(4) \times 1.07] + [(5) \times (1 + [0.07 \times 0.50])]$	\$ 1.9
(b)	Actual AVA	\$ 1.9
7.	AVA Gain (or Loss) <i>(6b) - (6a)</i>	\$ 0.0
8.	Expected UAAL at End of Year <i>(2a) - (6a)</i>	\$ 260.2
9.	Actual UAAL at End of Year <i>(2b) - (6b)</i>	\$ 222.8
10.	UAAL Gain (or Loss) <i>(8) - (9)</i>	\$ (37.4)



Schedule A – Results of the Valuation

LINE OF DUTY ACT FUND

	Valuation Date	
	June 30, 2016	June 30, 2015
1. NUMBER OF FTE EMPLOYEES	19,004.60	18,819.45
2. ACTUARIAL ACCRUED LIABILITY Present value of prospective benefits payable in respect of:		
(a) Present active members	\$144,829,305	\$171,400,399
(b) Present beneficiaries	<u>192,577,223</u>	<u>169,288,104</u>
(c) Total present value of prospective benefits	\$337,406,528	\$340,688,503
(d) Present value of future normal contributions	<u>112,724,074</u>	<u>94,880,703</u>
(e) Total actuarial accrued liability (2c) – (2d)	\$224,682,454	\$245,807,800
3. PRESENT ASSETS FOR VALUATION PURPOSES	<u>\$ 1,899,905</u>	<u>\$ 695,351</u>
4. UNFUNDED ACTUARIAL ACCRUED LIABILITY (2e) – (3)	\$222,782,549	\$245,112,449
5. AMORTIZATION PERIOD	30	30
6. NORMAL CONTRIBUTION*	\$ 12,945,744	\$ 12,948,346
7. ACCRUED LIABILITY CONTRIBUTION	<u>9,381,051</u>	<u>10,321,151</u>
8. TOTAL CONTRIBUTION (6) + (7)	\$ 22,326,795	\$ 23,269,497
9. NORMAL CONTRIBUTION PER FTE EMPLOYEE* (6) ÷ (1)	\$ 681.19	\$ 688.03
10. ACCRUED LIABILITY CONTRIBUTION PER FTE EMPLOYEE (7) ÷ (1)	<u>493.62</u>	<u>548.43</u>
11. TOTAL CONTRIBUTION PER FTE EMPLOYEE (9) + (10)	\$ 1,174.81	\$ 1,236.46
12. DISCOUNT RATE	4.75%	4.75%

* Includes administrative expenses and additional reserves.



Schedule A – Solvency Test

**SOLVENCY TEST
(\$ IN THOUSANDS)**

Valuation Date	Aggregate Accrued Liabilities For				Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
	(1) Active Member Contributions	(2) Retirees, Survivors, and Inactive Members	(3) Active Members (Employer Financed Portion)	Total		(1)	(2)	(3)
6/30/2016	n/a	\$192,578	\$32,105	\$224,683	\$ 1,900	n/a	0.99%	0.00%
6/30/2015	n/a	169,288	76,520	245,808	696	n/a	0.41	0.00
6/30/2014	n/a	152,120	73,696	225,816	6,914	n/a	4.55	0.00
6/30/2013	n/a	139,835	64,249	204,084	10,084	n/a	7.21	0.00
6/30/2012	n/a	131,501	94,673	226,174	6,052	n/a	4.60	0.00
6/30/2011	n/a	207,186	191,770	398,956	0	n/a	0.00	0.00



Schedule B – Plan Assets

GASB 43 and 45 define plan assets as resources, usually in the form of stocks, bonds, and other classes of investments, that have been segregated and restricted in a trust, or equivalent arrangement, in which (a) employer contributions to the plan are irrevocable, (b) assets are dedicated to providing benefits to retirees and their beneficiaries, and (c) assets are legally protected from creditors of the employers or plan administrator, for the payment of benefits in accordance with the terms of the plan.

For valuation purposes, the market value of assets is used. The market value of assets used for the valuation of the Plan is \$1,899,905.

**RECONCILIATION OF ASSETS
LINE OF DUTY ACT FUND**

VALUATION DATE	June 30, 2016
1. Funds available at beginning of year	\$ 695,351
Revenue for the year	
Employer contributions	\$ 9,756,444
Accrued HIC transfers	343,046
Net investment income	<u>125,000</u>
2. Total revenue	\$ 10,224,490
Expenditures for the year	
Health care benefit payments	\$ 8,385,228
Death benefit payments	150,000
DOA expenses	207,325
VRS expenses	<u>277,323</u>
3. Total expenditures	\$ 9,019,936
4. Revenue less expenditures (2) - (3)	\$ 1,204,554
5. Funds available at end of year (1) + (4)	\$ 1,899,905



Schedule C – Outline of Actuarial Assumptions and Methods

Assumptions and Methods Applicable to All Line of Duty Act Fund Employer Groups

Investment Return Rate:	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 D for a detailed explanation.
Funding Period:	30 years from the valuation date (open amortization, computed as a level percent of payroll).
Payroll Growth Rate:	3.00% per annum.
Asset Valuation Method:	Market Value of Assets
Service Related Disabilities:	For members of VaLORS, 20% of disabilities are assumed to be service related and result in coverage under the Plan. For all other members, 60% of disabilities are assumed to be service related and result in coverage under the Plan.
Service Related Deaths:	25% of active employee deaths. Of the service related deaths, 35% are assumed to be paid as a direct or proximate result of the performance of duty, with the remainder paid under the presumptive clause.
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.
Spouse Health Care Coverage:	Actual data provided is used for current beneficiaries. 67% of service-related deaths and 80% of service-related disabilities are assumed to result in spouse coverage, with wives assumed to be three years younger than males and husbands assumed to be two years older than females.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

Assumptions and Methods Applicable to All Line of Duty Act Fund Employer Groups

Administrative Expenses: Administrative expenses vary by projection year, new claims, and on-going claims.

Fiscal Year Ended	New Claims	On-Going Claims
2017	\$5,200	\$525
2018	\$6,760	\$682
2019 and Beyond*	\$5,558	\$561

*Assumed to increase by 3.00% per annum, compounded annually.

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.

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
2017	7.75%	5.75%
2018	7.00%	5.50%
2019	6.50%	5.25%
2020	6.00%	5.00%
2021	5.50%	5.00%
2022	5.25%	5.00%
2023 and Beyond	5.00%	5.00%

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.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

Assumptions and Methods Applicable to All Line of Duty Act Fund Employer Groups

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.

Initial Monthly Per Capita Adult Health Care Costs		
Valuation Date	Under Age 65	Ages 65 and Older
June 30, 2016		
Fiscal Year Ended 2017	\$843.46	\$458.82
Fiscal Years Ended 2018+*	\$892.41**	\$437.52
June 30, 2015	\$786.94	\$415.19

* Trended to second projection year.

**Of this amount, \$168.59 represents the assumed additional cost for the coverage of dependent children and is not aged. Additionally, for the portion of the cost that is aged, disabled employee costs are assumed to be 33% higher.

Adult per capita costs assumed after June 30, 2017 are 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.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

Age Related Morbidity:

For the initial projection year (fiscal year ended June 30, 2017), costs from non-employer based health care coverage (e.g., individual policies) are age-adjusted based upon the covered group’s aggregate experience and demographics. Based upon the limited data available, 20% of under age 65 health care costs are assumed to be from non-employer provided coverage and 40% of health care costs for beneficiaries ages 65 and older are assumed to be from non-employer based coverage. Employer based health care costs are not age-adjusted to avoid a “double counting” of the implicit subsidy liability, as the implicit subsidy liability for employer based health care coverage is assumed to be the responsibility of the underlying health care plan’s sponsor (i.e., it is assumed that a separate valuation is performed and the resulting liability disclosed). Following the initial projection year, 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	Initial Monthly Per Capita Adult Health Care Costs	Annual Increase
<30		0.0%
30 – 34		1.0%
35 – 39	Fiscal Year Ended 2017: \$1,251.63	1.5%
40 – 44		2.0%
45 - 49	Fiscal Years Ended 2018+: \$1,074.09*	2.6%
50 – 54		3.3%
55 – 59		3.6%
60 – 64		4.2%
65 – 69	Fiscal Year Ended 2017: \$398.88	3.0%
70 – 74		2.5%
75 – 79		2.0%
80 – 84	Fiscal Years Ended 2018+: \$380.37**	1.0%
85 – 89		0.5%
90 and Older		0.0%

* Trended to second projection year and excludes additional cost for the coverage of dependent children.

**Trended to second projection year.

Additional Reserves:

Initial reserves, increasing by health care cost trend, are assumed to provide additional margin for the cost of health care benefits incurred and reported to the administrator but awaiting processing as of June 30, 2016.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VRS STATE EMPLOYEES

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VRS STATE EMPLOYEES

RETIREMENT RATES:

Members Hired Prior to January 1, 2008: The following rates of retirement are assumed for members eligible to retire.

VRS State Employees Retirement Rates Hired Prior to January 1, 2008				
Age	Males		Females	
	Years of Service			
	0-29	>=30	0-29	>=30
<=49	0.000	0.000	0.000	0.000
50	0.030	0.100	0.032	0.100
51	0.030	0.100	0.031	0.100
52	0.030	0.100	0.030	0.100
53	0.030	0.100	0.030	0.100
54	0.030	0.100	0.035	0.100
55	0.050	0.100	0.050	0.100
56	0.050	0.100	0.050	0.100
57	0.045	0.100	0.045	0.100
58	0.040	0.100	0.055	0.100
59	0.050	0.100	0.055	0.100
60	0.050	0.100	0.055	0.150
61	0.100	0.150	0.100	0.200
62	0.150	0.250	0.150	0.300
63	0.150	0.200	0.150	0.200
64	0.150	0.200	0.150	0.200
65	0.300	0.300	0.300	0.400
66	0.300	0.250	0.300	0.300
67	0.300	0.250	0.300	0.250
68	0.300	0.200	0.300	0.250
69	0.300	0.200	0.300	0.200
>=70	1.000	1.000	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VRS STATE EMPLOYEES

RETIREMENT RATES: The following rates of retirement are assumed for members hired on or after January 1, 2008 and eligible to retire.

VRS State Employees - Members Hired On or After January 1, 2008														
Male														
Age	Years of Service													
	0-4	5-26*	27-28*	29-30*	31	32	33	34	35	36	37	38	39	>=40*
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100
57	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100
58	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
59	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
60	0.000	0.050	0.050	0.050	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
61	0.000	0.100	0.100	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
62	0.000	0.150	0.150	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
63	0.000	0.150	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
64	0.000	0.150	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
65	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
66	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.250
67	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.250
68	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.200
69	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.200
>=70	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

* Rate is 0.350 when age plus service equals 90.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VRS STATE EMPLOYEES

RETIREMENT RATES: The following rates of retirement are assumed for members hired on or after January 1, 2008 and eligible to retire.

VRS State Employees - Members Hired On or After January 1, 2008															
Females															
Age	Years of Service														
	0-4	5-25*	26-27*	28-29*	30	31	32	33	34	35	36	37	38	39	>=40*
<=49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350
51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100
52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100
53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100
58	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
59	0.000	0.000	0.000	0.000	0.000	0.350	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
60	0.000	0.055	0.055	0.055	0.350	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
61	0.000	0.100	0.100	0.100	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
62	0.000	0.150	0.150	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
63	0.000	0.150	0.150	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
64	0.000	0.150	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
65	0.000	0.300	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
66	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
67	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.250
68	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.250
69	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.200
>=70	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

* Rate is 0.350 when age plus service equals 90.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VRS STATE EMPLOYEES

DISABILITY RATES: As shown below for selected ages. 60% of disabilities are assumed to be service related and result in coverage under the Plan.

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



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VRS STATE EMPLOYEES

TERMINATION RATES:

The following withdrawal rates are used based on age and service. (For causes other than death, disability, or retirement)

VRS State Employees Rates of Termination, Hired Prior to January 1, 2008								
Age	Male				Female			
	Years of Service							
	0-2	3-4	5-9	>=10	0-2	3-4	5-9	>=10
20	0.245	0.175	0.175	0.000	0.283	0.198	0.198	0.000
25	0.221	0.130	0.130	0.000	0.256	0.157	0.157	0.000
30	0.199	0.110	0.110	0.050	0.212	0.130	0.130	0.060
35	0.167	0.093	0.093	0.045	0.178	0.110	0.110	0.050
40	0.145	0.075	0.075	0.034	0.155	0.090	0.090	0.036
45	0.129	0.070	0.070	0.023	0.139	0.074	0.074	0.025
50	0.115	0.061	0.061	0.000	0.130	0.063	0.063	0.000
55	0.102	0.060	0.060	0.000	0.125	0.060	0.000	0.000
60	0.106	0.070	0.000	0.000	0.123	0.070	0.000	0.000
65	0.113	0.110	0.000	0.000	0.140	0.120	0.000	0.000
70	0.131	0.140	0.000	0.000	0.249	0.140	0.000	0.000

VRS State Employees Rates of Termination, Hired On or After January 1, 2008								
Age	Male				Female			
	Years of Service							
	0-2	3-4	5-9	>=10	0-2	3-4	5-9	>=10
20	0.245	0.175	0.175	0.000	0.283	0.198	0.198	0.000
25	0.221	0.130	0.130	0.000	0.256	0.157	0.157	0.000
30	0.199	0.110	0.110	0.050	0.212	0.130	0.130	0.060
35	0.167	0.093	0.093	0.045	0.178	0.110	0.110	0.050
40	0.145	0.075	0.075	0.034	0.155	0.090	0.090	0.036
45	0.129	0.070	0.070	0.023	0.139	0.074	0.074	0.025
50	0.115	0.061	0.061	0.020	0.130	0.063	0.063	0.020
55	0.102	0.060	0.060	0.004	0.125	0.060	0.060	0.004
60	0.106	0.070	0.000	0.000	0.123	0.070	0.000	0.000
65	0.113	0.110	0.000	0.000	0.140	0.120	0.000	0.000
70	0.131	0.140	0.000	0.000	0.249	0.140	0.000	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VRS STATE EMPLOYEES

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 - 2	5.35%
3	4.75
4 - 6	4.45
7	4.35
8	4.25
9 - 10	4.00
11 - 19	3.65
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

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

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

DISABILITY RATES: As shown below for selected ages. 60% of disabilities are assumed to be service related and result in coverage under the Plan.

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



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

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

SPORS Rates of Termination												
Age	Males											
	Years of Service											
	0	1	2	3	4	5	6	7	8	9	>=10	
20	0.075	0.075	0.075	0.210	0.210	0.210	0.210	0.210	0.210	0.210	0.210	0.030
25	0.075	0.075	0.075	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.030
30	0.075	0.075	0.075	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.030
35	0.075	0.075	0.075	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.024
40	0.075	0.075	0.075	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.018
45	0.100	0.100	0.100	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.014
50	0.100	0.100	0.100	0.045	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000
55	0.100	0.100	0.100	0.067	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000
60	0.100	0.100	0.100	0.075	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000
65	0.100	0.100	0.100	0.075	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	0.100	0.100	0.100	0.075	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SPORS Rates of Termination											
Age	Females										
	Years of Service										
	0	1	2	3	4	5	6	7	8	9	>=10
20	0.184	0.125	0.101	0.108	0.116	0.122	0.123	0.096	0.070	0.053	0.036
25	0.183	0.133	0.108	0.105	0.104	0.105	0.102	0.083	0.066	0.054	0.044
30	0.181	0.144	0.119	0.102	0.091	0.084	0.078	0.069	0.062	0.057	0.055
35	0.170	0.144	0.121	0.100	0.085	0.074	0.067	0.063	0.062	0.060	0.061
40	0.152	0.135	0.117	0.098	0.084	0.074	0.067	0.065	0.064	0.062	0.062
45	0.127	0.117	0.108	0.098	0.090	0.082	0.077	0.075	0.068	0.064	0.059
50	0.094	0.091	0.093	0.100	0.101	0.100	0.098	0.092	0.075	0.066	0.052
55	0.052	0.057	0.074	0.102	0.119	0.126	0.129	0.118	0.084	0.067	0.041
60	0.010	0.013	0.049	0.106	0.142	0.162	0.171	0.151	0.096	0.068	0.026
65	0.000	0.000	0.015	0.111	0.171	0.205	0.222	0.191	0.110	0.069	0.006
70	0.000	0.000	0.000	0.119	0.210	0.264	0.291	0.246	0.128	0.071	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

SPORS

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 - 4	4.75%
5	4.65
6 - 9	4.40
10 - 19	4.00
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

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

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

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

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



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

DISABILITY RATES: As shown below for selected ages. 20% of disabilities are assumed to be service related and result in coverage under the Plan.

VaLORS Rates of Disability	
Age	Unisex
20	0.00150
25	0.00300
30	0.00600
35	0.00800
40	0.00800
45	0.01000
50	0.01200
55	0.01200
60	0.01000
65	0.00000
70	0.00000

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

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



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

VaLORS

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 - 4	4.75%
5	4.65
6 - 9	4.40
10 - 19	4.00
20 or more	3.50



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP A*

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

Group A Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00022	0.00025	0.02257	0.00014	0.00014	0.00745
25	0.00028	0.00034	0.02257	0.00014	0.00016	0.00745
30	0.00036	0.00045	0.02257	0.00019	0.00022	0.00745
35	0.00057	0.00076	0.02257	0.00033	0.00038	0.00745
40	0.00086	0.00095	0.02257	0.00045	0.00052	0.00745
45	0.00104	0.00122	0.02257	0.00069	0.00081	0.00745
50	0.00135	0.00167	0.02512	0.00100	0.00119	0.01154
55	0.00175	0.00292	0.03156	0.00168	0.00231	0.01654
60	0.00290	0.00567	0.03803	0.00298	0.00457	0.02184
65	0.00488	0.01109	0.04498	0.00456	0.00878	0.02803
70	0.00684	0.01816	0.05445	0.00628	0.01515	0.03764
75		0.03181	0.06941		0.02394	0.05223
80		0.06013	0.09215		0.03987	0.07231
85		0.10670	0.12188		0.06866	0.10020
90		0.18438	0.15524		0.12400	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.

*Please refer to Section I for a description of those employer groups belonging to Group A.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP A

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

Group A Rates of Retirement		
Age	Unisex	
	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000
50	0.090	0.250
51	0.085	0.155
52	0.085	0.145
53	0.085	0.165
54	0.085	0.130
55	0.085	0.180
56	0.085	0.240
57	0.085	0.210
58	0.100	0.240
59	0.135	0.315
60	0.200	0.350
61	0.250	0.350
62	0.300	0.500
63	0.300	0.500
64	0.400	0.500
>=65	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP A

DISABILITY RATES: As shown below for selected ages. 60% of disabilities are assumed to be service related and result in coverage under the Plan.

Group A Rates of Disability		
Age	Male	Female
20	0.00000	0.00000
25	0.00008	0.00000
30	0.00050	0.00050
35	0.00100	0.00110
40	0.00180	0.00240
45	0.00275	0.00350
50	0.00400	0.00530
55	0.00550	0.00740
60	0.00650	0.00810
65	0.00000	0.00000

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

Group A Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.078	0.068	0.000
30	0.082	0.056	0.021
35	0.080	0.044	0.024
40	0.074	0.043	0.017
45	0.092	0.046	0.015
50	0.093	0.045	0.028
55	0.083	0.063	0.000
60	0.087	0.065	0.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP A

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	4.75%
5	4.65
6 – 9	4.40
10 - 19	4.00
20 or more	3.50

As Group A includes volunteers, the Entry Age Normal (Level Percent of Pay) actuarial cost method assumes an initial pay of \$1 for volunteers that increases annually by the assumed rate of inflation, 3.00%.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP B*

MORTALITY RATES:

Pre-Retirement:

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

Post-Retirement:

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

Post-Disablement:

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

Group B Mortality Rates						
Age	Male			Female		
	Pre Retirement	Post Retirement	Post Disablement	Pre Retirement	Post Retirement	Post Disablement
20	0.00022	0.00025	0.02257	0.00014	0.00014	0.00745
25	0.00028	0.00034	0.02257	0.00014	0.00016	0.00745
30	0.00036	0.00045	0.02257	0.00019	0.00022	0.00745
35	0.00057	0.00076	0.02257	0.00033	0.00038	0.00745
40	0.00086	0.00095	0.02257	0.00045	0.00052	0.00745
45	0.00104	0.00122	0.02257	0.00069	0.00081	0.00745
50	0.00135	0.00167	0.02512	0.00100	0.00119	0.01154
55	0.00175	0.00292	0.03156	0.00168	0.00231	0.01654
60	0.00290	0.00567	0.03803	0.00298	0.00457	0.02184
65	0.00488	0.01109	0.04498	0.00456	0.00878	0.02803
70	0.00684	0.01816	0.05445	0.00628	0.01515	0.03764
75		0.03181	0.06941		0.02394	0.05223
80		0.06013	0.09215		0.03987	0.07231
85		0.10670	0.12188		0.06866	0.10020
90		0.18438	0.15524		0.12400	0.14005

Mortality improvement is anticipated under the post-retirement assumption as projected with Scale AA.

*Please refer to Section I for a description of those employer groups belonging to Group B.



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP B

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

Group B Rates of Retirement		
Age	Unisex	
	Reduced Retirement	Unreduced Retirement
<=49	0.000	0.000
50	0.085	0.250
51	0.090	0.140
52	0.070	0.120
53	0.080	0.120
54	0.080	0.105
55	0.085	0.175
56	0.085	0.165
57	0.085	0.185
58	0.095	0.190
59	0.115	0.285
60	0.200	0.350
61	0.250	0.350
62	0.300	0.500
63	0.300	0.500
64	0.400	0.500
>=65	1.000	1.000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP B

DISABILITY RATES: As shown below for selected ages. 60% of disabled cases are assumed to be service related and result in coverage under the Plan..

Group B Rates of Disability	
Age	Unisex
20	0.00000
25	0.00000
30	0.00030
35	0.00068
40	0.00113
45	0.00285
50	0.00383
55	0.00480
60	0.00638
65	0.00000



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP B

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

Male Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.130	0.085	0.000
30	0.110	0.075	0.050
35	0.110	0.070	0.038
40	0.100	0.060	0.028
45	0.130	0.060	0.024
50	0.110	0.060	0.032
55	0.150	0.080	0.005
60	0.110	0.100	0.005
65	0.220	0.108	0.050

Female Rates of Termination			
Age	Years of Service		
	0 - 2	3 - 9	>=10
25	0.130	0.100	0.000
30	0.120	0.080	0.045
35	0.140	0.080	0.045
40	0.140	0.070	0.035
45	0.120	0.060	0.035
50	0.120	0.060	0.035
55	0.120	0.050	0.005
60	0.120	0.050	0.005
65	0.224	0.108	0.050



Schedule C – Outline of Actuarial Assumptions and Methods (continued)

GROUP B

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	4.75%
5	4.65
6 – 9	4.40
10 - 19	4.00
20 or more	3.50

As Group B includes volunteers, the Entry Age Normal (Level Percent of Pay) actuarial cost method assumes an initial pay of \$1 for volunteers that increases annually by the assumed rate of inflation, 3.00%.



Schedule D – Actuarial Cost Method

The Plan's valuation is prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable at disability or death. The calculations are based on the member's age, years of service, gender, and an assumed future interest earnings rate (currently 4.75%). The calculations consider the probability of a member's death, retirement, or termination of employment prior to becoming eligible for a 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.

The employer contributions required to support the benefits of the Line of Duty Act Fund consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the "entry age normal" method (EAN). Under this method, a calculation is made for postemployment benefits to determine the uniform and constant percentage rate of employer contribution that, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required to meet the cost of all benefits payable on a member's behalf. As the valuation includes volunteers, the cost method assumes an initial pay of \$1 for volunteers that increases annually by the assumed rate of inflation, 3.00%. Additionally, the normal contribution includes annual administrative expenses and the annual cost of benefits incurred and reported to the administrator but awaiting processing.

The unfunded accrued liability for the Plan is determined by subtracting the current assets from the liability of active employees and current recipients. The accrued liability contribution amortizes the balance of the unfunded accrued liability over a period of 30 years from the valuation date.



Schedule E – Summary of Main Plan Provisions as Interpreted for Valuation Purposes

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

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.



Schedule E – Summary of Main Plan Provisions as Interpreted for Valuation Purposes (continued)

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.

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



Schedule E – Summary of Main Plan Provisions as Interpreted for Valuation Purposes (continued)

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.

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.



Schedule F – Schedule of Active Member Data

**SCHEDULE OF ACTIVE MEMBER DATA
AS OF JUNE 30, 2016**

Attained Age	Years of Service to Valuation Date									Total
	Less than 1 Year	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 or more	
Under 25	3,469	1,060	6							4,535
25 - 29	370	4,023	267	18						4,678
30 - 34	207	891	2,357	408	3					3,866
35 - 39	117	223	1,396	1,172	332	3				3,243
40 - 44	80	168	276	1,986	733	258	4			3,505
45 - 49	48	111	233	369	1,663	596	286	9		3,315
50 - 54	39	97	197	291	1,040	306	346	152	3	2,471
55 - 59	14	48	140	174	650	129	107	138	66	1,466
60 - 64	6	18	41	86	94	246	26	35	84	636
65 - 69	3		13	19	16	95	8	4	25	183
70 & Up			1	2	2	86	1	1	4	97
Total	4,353	6,639	4,927	4,525	4,533	1,719	778	339	182	27,995



Schedule F – Schedule of Active Member Data (continued)

**SCHEDULE OF FULL-TIME ACTIVE MEMBER DATA
AS OF JUNE 30, 2016**

Attained Age	Years of Service to Valuation Date									Total
	Less than 1 Year	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 or more	
Under 25	784	495	6	0	0	0	0	0	0	1,285
Avg. Pay	32,471	34,860	34,002	0	0	0	0	0	0	33,398
25 – 29	370	1,866	267	18	0	0	0	0	0	2,521
Avg. Pay	31,044	42,370	37,980	45,537	0	0	0	0	0	40,266
30 – 34	207	584	1,287	408	3	0	0	0	0	2,489
Avg. Pay	31,293	40,868	44,033	46,758	62,178	0	0	0	0	42,699
35 – 39	117	223	665	914	332	3	0	0	0	2,254
Avg. Pay	32,198	36,014	46,915	49,653	51,515	52,147	0	0	0	46,867
40 – 44	80	168	276	942	733	258	4	0	0	2,461
Avg. Pay	31,792	36,006	38,407	50,193	54,072	56,434	48,673	0	0	49,111
45 – 49	48	111	233	369	1,022	596	286	9	0	2,674
Avg. Pay	34,594	35,332	38,548	45,745	54,544	59,006	64,154	67,582	0	52,846
50 – 54	39	97	197	291	584	306	346	152	3	2,015
Avg. Pay	32,066	37,376	40,756	44,986	52,851	54,931	71,469	75,163	64,870	54,599
55 – 59	14	48	140	174	403	129	107	138	66	1,219
Avg. Pay	36,407	41,244	39,314	43,875	52,002	49,954	65,821	78,980	82,969	54,509
60 – 64	6	18	41	86	94	112	26	35	84	502
Avg. Pay	37,742	43,764	36,944	43,707	45,539	56,953	59,622	65,307	83,575	55,385
65 – 69	3	0	13	19	16	22	8	4	25	110
Avg. Pay	33,072	0	51,204	44,796	46,519	61,351	48,572	67,804	86,669	59,423
70 & Up	0	0	1	2	2	13	1	1	4	24
Avg. Pay	0	0	35,771	35,202	46,294	68,072	56,771	56,528	85,241	64,082
Total	1,668	3,610	3,126	3,223	3,189	1,439	778	339	182	17,554
Avg. Pay	32,061	40,050	42,721	48,044	53,185	56,810	67,236	75,356	83,509	47,332

Note: As no pay was reported for the 7,731 part-time members of the National Guard, an average pay of \$4,625 was assumed.



Schedule G – Projections

The results of actuarial valuations are a “snapshot” of the financial position on the valuation date, based on the assumed number of active employees and current beneficiaries. Projections simulate future actuarial valuation results over a forecast period (seven years in this case) by “creating” future new hires and performing valuations using the projected membership. The projections provided below assume a stationary active population. In addition, the following items are assumed for the projected results provided in this section of the report:

- Board approved contributions of \$567.37 per FTE employee are made to the LODA Fund for the fiscal years ending June 30, 2017 and June 30, 2018.
- A payment reserve is to be established to handle cash flow timing issues. The payment reserve is assumed to be two months of the next fiscal year’s projected costs.
- Health Insurance Credit Program (HIC) reimbursements will be used to fund increases to the payment reserve with any excess amounts used to reduce contributions.
- Projected contributions are made at the levels indicated and are paid as scheduled.

All other demographic and economic changes are assumed to occur in accordance with the actuarial assumptions used for the actuarial valuation.



Schedule G – Projections (continued)

**PROJECTED COSTS AND CONTRIBUTIONS
ALL PARTICIPATING EMPLOYER GROUPS
JUNE 30, 2016 VALUATION BASIS**

Fiscal Year Ended	Actual 2016	Projected						
		2017	2018	2019	2020	2021	2022	2023
FTE Employees	18,804.34	19,004.60	19,004.60	19,004.60	19,004.60	19,004.60	19,004.60	19,004.60
Cash Flow (Per FTE Employee)								
Employer Contribution Rate	\$518.84	\$567.37	\$567.37	\$637.02	\$692.00	\$737.26	\$796.87	\$851.02
Benefit Costs and Expenses*	(461.43)	(558.57)	(598.84)	(651.12)	(706.70)	(750.24)	(812.98)	(868.08)
Investment Income	<u>6.65</u>	<u>18.59</u>	<u>18.94</u>	<u>20.43</u>	<u>22.04</u>	<u>23.51</u>	<u>25.37</u>	<u>27.09</u>
Net Cash Flow	\$64.06	\$27.39	(\$12.53)	\$6.33	\$7.34	\$10.53	\$9.26	\$10.03
Cash Flow (\$1,000s)								
Employer Contribution Rate	\$9,756	\$10,783	\$10,783	\$12,106	\$13,151	\$14,011	\$15,144	\$16,173
Benefit Costs and Expenses*	(8,677)	(10,615)	(11,381)	(12,374)	(13,431)	(14,258)	(15,450)	(16,498)
Investment Income	<u>125</u>	<u>353</u>	<u>360</u>	<u>388</u>	<u>419</u>	<u>447</u>	<u>482</u>	<u>515</u>
Net Cash Flow	\$1,204	\$521	(\$238)	\$120	\$139	\$200	\$176	\$190
End of Year Net Position	\$1,900	\$2,420	\$2,182	\$2,303	\$2,442	\$2,642	\$2,818	\$3,009

*Reflects estimated reduction in costs from excess HIC receipts.