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December 18, 2015

Ms. Cynthia Wilkinson
Policy, Planning and Compliance Director
Virginia Retirement System
1200 E. Main Street
Richmond, VA 23219

Dear Ms. Wilkinson:

Enclosed are 13 original bound copies of the "Report on the Actuarial Valuation of the Line of Duty Act Fund
Prepared as of June 30, 2015".

Sincerely yours,

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

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

JIF/EHG:bcn

Enclosure

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Cavanaugh Macdonald
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**Virginia
Retirement
System**

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

Prepared as of June 30, 2015





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

December 18, 2015

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, 2015.

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 of the Virginia Code (Code) and Item 264 of the 2015 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 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.

Projections estimate annual Full-Time Equivalent (FTE) employee contributions for the fiscal year 2017 and 2018 to be \$567.37. The estimated contribution rates assume Plan participation of 11,252.70 State FTE employees and 7,566.75 Political Subdivision FTE employees, for a total of 18,819.45 FTE employees. The contribution rates represent, in total, the estimated cost of providing benefits payable in fiscal year 2017 and 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. The actuarially calculated employer contribution rates based on the June 30, 2015 valuation are for fiscal years 2017 and 2018.

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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. Additionally, the State Comptroller 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 post-employment 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). 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 adjustments to the percentage of death benefit payments made as a direct or proximate result of the performance of duty, the assumed per capita health care costs, the assumed rates of health care inflation, and a change to the methodology used to determine costs for non-employer based health care coverage (e.g., individual policies).

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 principles of practice prescribed 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. The aggregate assumptions recommended by the actuary are reasonably related to the experience under the Plan and are reasonable expectations of anticipated experience under the Plan.

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



The Board of Trustees
December 18, 2015
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Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Jose I. Fernandez'.

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

A handwritten signature in blue ink, appearing to read 'Eric H. Gary'.

Eric H. Gary, FSA, FCA, MAAA
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, 2015	June 30, 2014
Number FTE Employees	18,819.45	19,219.45
Number Receiving Benefits	<u>994.00</u>	<u>936.00</u>
Total	19,813.45	20,155.45
Assets:		
Market Value	\$ 695,351	\$ 6,914,357
Actuarial Value	\$ 695,351	\$ 6,914,357
Unfunded Actuarial Accrued Liability	\$245,112,449	\$210,610,032
Loan Balance	<u>0</u>	<u>8,291,170</u>
Total Unfunded Liability	\$245,112,449	\$218,901,202
Amortization Period (Years)		
Accrued Liability	30	30
Loan	n/a	2
Annual Required Contribution (ARC):		
Normal Cost*	\$ 12,948,346	\$ 11,503,417
Accrued Liability	10,321,151	8,868,431
Loan	<u>0</u>	<u>4,377,806</u>
Total ARC	<u>\$ 23,269,497</u>	<u>\$ 24,749,654</u>
Contribution Per FTE Employee		
Normal Cost	\$ 662.72	\$ 576.97
Administrative Expenses	14.98	14.03
Additional Reserves	<u>10.33</u>	<u>7.53</u>
Total Adjusted Normal Cost	\$ 688.03	\$ 598.53
Accrued Liability	548.43	461.43
Loan	<u>0.00</u>	<u>227.78</u>
Total ARC	<u>\$ 1,236.46</u>	<u>\$ 1,287.74</u>
Expected Benefits Paid**:		
Total	\$ 9,239,974	\$ 8,222,657
Per FTE Employee	\$ 490.98	\$ 427.83
Discount Rate	4.75%	4.75%
Loan Rate	n/a	7.00%

* 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, 2015 indicates that the Annual Required Contribution (ARC) under GASB 43 and 45 is \$1,236.46 per FTE employee payable for the fiscal year ending June 30, 2016. Comments on the valuation results as of June 30, 2015 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. The main provisions of the Plan, as summarized in Schedule E, were taken into account in the current valuation.
6. 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.



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 LODA Program 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, 2015

Group	Number	Weight	FTE Employees	Estimated Contributions*
State/VaLORS/SPORS	9,783	100%	9,783.00	\$5,075,812
National Guard				
Full-Time	692	100%	1,469.70	\$ 762,539
Part-Time	7,777	10%		
<i>State Employees</i>	<i>18,252</i>		<i>11,252.70</i>	<i>\$5,838,351</i>
Participating Political Subdivisions				
Full-Time	6,882	100%	6,882.00	\$3,570,657
Volunteer	2,739	25%	684.75	\$ 355,276
<i>Political Subdivision Employees</i>	<i>9,621</i>		<i>7,566.75</i>	<i>\$3,925,933</i>
Total	27,873		18,819.45	\$9,764,284

*FY 2016 contribution rate of \$518.84 per FTE employee based upon June 30, 2013 estimated headcount of 20,056

Based upon 27,873 total lives, the valuation provides results for a group comprised of 18,819.45 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 beneficiaries identified as of June 30, 2015 and for the prior valuation date of June 30, 2014.

NUMBER OF HEALTH CARE BENEFICIARIES

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 OF JUNE 30, 2014			
Type	State	Political Subdivisions	Total
Disabled Participants	209	279	488
Spouses of Currently Disabled Participants	163	222	385
<u>Surviving Spouses</u>	<u>26</u>	<u>37</u>	<u>63</u>
Total	398	538	936

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
6/30/2015	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
6/30/2010	1,211	8,480,766	n/a	n/a	1,211	8,480,766



Section III – Assets

1. As of June 30, 2015, \$695,351 is assumed to be held in a qualified trust solely to provide benefits to retirees 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.
2. On September 30, 2014, the loan balance of \$8,436,266 was repaid in full. Therefore, loans provided by the Group Life Insurance Program to cover expenses and claims for fiscal years 2011 and 2012 total \$0 as of June 30, 2015.



Section IV – Comments on Valuation

1. The June 30, 2015 valuation shows the Plan has prospective benefit liabilities to be paid on account of the present active membership of \$171,400,399. The prospective benefit liabilities for the Plan on account of benefits payable to current beneficiaries amounts to \$169,288,104. The total prospective benefit liabilities of the Plan amounts to \$340,688,503. Against these liabilities, the Plan has present assets of \$695,351 for valuation purposes. Therefore, the present value of contributions to be made in the future on account of benefits is \$339,993,152 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 administrative expenses of the Plan, and the cost of benefits incurred and reported to the administrator but awaiting processing (additional reserves). The normal contribution for the Plan is determined to be \$12,948,346.
3. Prospective normal contributions have a present value of \$94,880,703. When this amount is subtracted from \$339,993,152, which is the present value of the total future contributions to be made by the employers, exclusive of loan repayments, there remains \$245,112,449 as the amount of future accrued liability contributions.
4. An accrued liability contribution of \$10,321,151 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 the Plan on account of benefits consist of normal contributions, accrued liability contributions, and loan repayments. The resulting contribution is \$23,269,497. This amount is equivalent to an annual amount of \$1,236.46 per FTE employee.



Section IV – Comments on Valuation (continued)

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

1. 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, 2015

Group	Count
Active Members (FTE Employees)	18,819
Disabled Members	518
Spouses of Disabled Members	412
Surviving Spouses	<u>64</u>
Total	19,813

2. 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)
6/30/2015	\$ 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
6/30/2010	0	576,042	576,042	0.00

*Actuarial cost method of Projected Unit Credit prior to 6/30/2013 and Entry Age Normal 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, 2015. Additional information as of the latest actuarial valuation follows:

Valuation Date	6/30/2015
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)	7.50% - 5.00%
Medical Trend Assumption (Ages 65 and Older)	5.50% - 5.00%
Year of Ultimate Trend Rate	2020

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,



Section V – Accounting Information (continued)

GASB's 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 which 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.



Schedule A – Results of the Valuation

LINE OF DUTY ACT FUND

	Valuation Date	
	June 30, 2015	June 30, 2014
1. NUMBER OF FTE EMPLOYEES	18,819.45	19,219.45
2. ACTUARIAL ACCRUED LIABILITY Present value of prospective benefits payable in respect of:		
(a) Present active members	\$171,400,399	\$159,316,748
(b) Present beneficiaries	<u>169,288,104</u>	<u>143,828,177</u>
(c) Total present value of prospective benefits	\$340,688,503	\$303,144,925
(d) Present value of future normal contributions	<u>94,880,703</u>	<u>85,620,536</u>
(e) Total actuarial accrued liability (2c) – (2d)	\$245,807,800	\$217,524,389
3. PRESENT ASSETS FOR VALUATION PURPOSES	\$ 695,351	\$ 6,914,357
4. UNFUNDED ACTUARIAL ACCRUED LIABILITY (2e) – (3)	\$245,112,449	\$210,610,032
5. LOAN BALANCE	<u>0</u>	<u>8,291,170</u>
6. TOTAL LIABILITY (4) + (5)	\$245,112,449	\$218,901,202
7. AMORTIZATION PERIOD		
(a) Actuarial Accrued Liability	30	30
(b) Loan	n/a	2
8. NORMAL CONTRIBUTION*	\$ 12,948,346	\$ 11,503,417
9. ACCRUED LIABILITY CONTRIBUTION	10,321,151	8,868,431
10. LOAN REPAYMENT	<u>0</u>	<u>4,377,806</u>
11. TOTAL CONTRIBUTION BASED ON ACTIVE PAYROLL (8) + (9) + (10)	\$ 23,269,497	\$ 24,749,654
12. NORMAL CONTRIBUTION PER FTE EMPLOYEE* (8) ÷ (1)	\$ 688.03	\$ 598.53
13. ACCRUED LIABILITY CONTRIBUTION PER FTE EMPLOYEE (9) ÷ (1)	548.43	461.43
14. LOAN REPAYMENT PER FTE EMPLOYEE (10) ÷ (1)	<u>0.00</u>	<u>227.78</u>
15. TOTAL CONTRIBUTION PER FTE EMPLOYEE (12) + (13) + (14)	\$ 1,236.46	\$ 1,287.74
16. DISCOUNT RATE	4.75%	4.75%
17. LOAN RATE	n/a	7.00%

* 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)
6/30/2015	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
6/30/2010	n/a	200,908	375,134	576,042	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 \$695,351.

On September 30, 2014, the loan balance of \$8,436,266 was repaid in full. Therefore, loans provided by the Group Life Insurance Program to cover expenses and claims for fiscal years 2011 and 2012 total \$0 as of June 30, 2015.



Schedule B – Plan Assets (continued)

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

VALUATION DATE	June 30, 2015
1. Funds available at beginning of year	\$ 6,914,357
Revenue for the year	
Employer contributions	\$ 9,968,960
Accrued HIC transfers	339,598
Net investment income	<u>179,000</u>
2. Total revenue	\$ 10,487,558
Expenditures for the year	
Health care benefit payments	\$ 7,991,502
Death benefit payments	62,500
DOA expenses	191,392
VRS expenses	170,000
Loan interest	145,096
Loan repayments	<u>8,291,170</u>
3. Total expenditures	\$ 16,851,660
4. Revenue less expenditures (2) - (3)	\$ (6,364,102)
5. Loan balance as of June 30, 2014	\$ 8,291,170
6. Loan interest	145,096
7. Loan repayments	<u>(8,436,266)</u>
8. Loan balance as of June 30, 2015 (5) + (6) + (7)	\$ 0
9. Net loan activity (8) - (5)	\$ (8,291,170)
10. Funds available at end of year (1) + (4) + (6)	\$ 695,351



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 service, 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, 40% 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.
Administrative Expenses:	Administrative expenses of \$3,150 per new claim and \$320 per on-going claim, increasing by 3.00% per annum, compounded annually.



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

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

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 participants. 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
2016	7.50%	5.50%
2017	6.75%	5.25%
2018	6.25%	5.00%
2019	5.75%	5.00%
2020	5.25%	5.00%
2021 and Beyond	5.00%	5.00%

Initial Per Capita Health Care Costs:

Initial Monthly Per Capita Adult Health Care Costs		
Valuation Date	Under Age 65	Ages 65 and Older
June 30, 2015	\$786.94	\$415.19
June 30, 2014	\$725.36	\$374.38

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.

Future experience may differ significantly from the cost estimates presented in this report due to unforeseen and random events. As such, the valuation's results should be viewed as having a likely range of variability.



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

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

Age Related Morbidity:

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. Here, 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). 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	\$1,167.13	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	\$359.84	3.0%
70 – 74		2.5%
75 – 79		2.0%
80 – 84		1.0%
85 – 89		0.5%
90 and Older		0.0%

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, 2015.



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:

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

VRS State Employees Rates of Retirement Hired On or After January 1, 2008				
Age	Males		Females	
	Age & Service Meets Rule of 90			
	No	Yes	No	Yes
<=49	0.000	0.000	0.000	0.000
50	0.000	0.350	0.000	0.350
51	0.000	0.100	0.000	0.100
52	0.000	0.100	0.000	0.100
53	0.000	0.100	0.000	0.100
54	0.000	0.100	0.000	0.100
55	0.000	0.100	0.000	0.100
56	0.000	0.100	0.000	0.100
57	0.000	0.100	0.000	0.100
58	0.000	0.100	0.000	0.100
59	0.000	0.100	0.000	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

* Rate is 35% 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)

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	0.030
25	0.075	0.075	0.075	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	0.030
35	0.075	0.075	0.075	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	0.018
45	0.100	0.100	0.100	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
55	0.100	0.100	0.100	0.067	0.067	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
65	0.100	0.100	0.100	0.075	0.075	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

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)

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)

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 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 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. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the total expected career service 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.

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 years from the valuation date.



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

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

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), 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 LODA Program'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. If allowed by the Code and if feasible, it may be beneficial to mandate a uniform benefit for all, or at least some, participating employer groups. 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.

From a GASB accounting perspective, an additional OPEB liability may arise from the implicit subsidy produced by the averaging of active and beneficiary experience in the determination of a sponsoring employer group's costs. The results presented assume the Plan has an implicit subsidy liability for non-employer based coverage and the implicit subsidy liability for employer based health care coverage is the responsibility of the underlying health care plan's sponsor. Effective March 31, 2015, guidance under actuarial standards of practice indicate the actuary should reflect the full age-specific cost, including the implicit subsidy. Additionally, new GASB standards require this recognition for future accounting disclosures.

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. Additionally, by using the LODA Program's recent experience as a cost basis, the results presented implicitly include any employer offsets netted from benefit claims prior to submission to the DOA. Those employer groups currently subsidizing health care benefits may discontinue their subsidies once participation in the Plan begins.

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 2018 (if applicable),



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

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.

Existing Beneficiaries

Participating political subdivision employer groups must make an irrevocable election to participate prior to the fiscal year 2013. Political subdivision employer groups who elect 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. Additionally, the State Comptroller may want to consider this potential risk in regards to its authority to waive the five-year statute of limitation on claims.



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

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



Schedule F – Schedule of Active Member Data

**SCHEDULE OF ACTIVE MEMBER DATA
AS OF JUNE 30, 2015**

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	3,440	1,128	6	0	0	0	0	0	0	4,574
25 - 29	360	3,669	464	6	0	0	0	0	0	4,499
30 - 34	147	1,030	2,190	353	5	0	0	0	0	3,725
35 - 39	94	338	1,437	1,048	329	4	0	0	0	3,250
40 - 44	80	312	399	1,922	769	211	3	0	0	3,696
45 - 49	39	203	387	804	1,118	460	328	8	0	3,347
50 - 54	34	168	263	301	1,028	235	368	98	4	2,499
55 - 59	13	73	172	175	588	94	96	116	68	1,395
60 - 64	1	22	72	89	112	184	28	31	81	620
65 - 69	0	2	19	9	21	96	8	5	23	183
70 & Up	0	0	1	2	3	73	2	1	3	85
Totals	4,208	6,945	5,410	4,709	3,973	1,357	833	259	179	27,873



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 \$518.84 per FTE employee are made to the LODA Fund for the fiscal year ending June 30, 2016.
- 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 are assumed to be applied to the loan balance, where applicable, at the end of the following fiscal year. Now the loans from the GLI are repaid, HIC receipts 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, 2015 VALUATION BASIS**

Fiscal Year	Actual 2015	Projected						
		2016	2017	2018	2019	2020	2021	2022
FTE Employees	19,213.94	18,819.45	18,819.45	18,819.45	18,819.45	18,819.45	18,819.45	18,819.45
Cash Flow (Per FTE Employee)								
Employer Contribution Rate	\$518.84	\$518.84	\$567.37	\$567.37	\$627.11	\$672.32	\$713.34	\$765.03
Benefit Costs and Expenses*	(420.31)	(498.09)	(544.80)	(588.52)	(639.05)	(686.97)	(727.00)	(781.02)
Loan Activity	(431.52)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Income	<u>9.32</u>	<u>14.71</u>	<u>17.60</u>	<u>18.48</u>	<u>20.01</u>	<u>21.41</u>	<u>22.74</u>	<u>24.36</u>
Net Cash Flow	(\$323.67)	\$35.46	\$40.17	(\$2.67)	\$8.07	\$6.76	\$9.08	\$8.37
Cash Flow (\$1,000s)								
Employer Contribution Rate	\$9,969	\$9,764	\$10,678	\$10,678	\$11,802	\$12,653	\$13,425	\$14,397
Benefit Costs and Expenses*	(8,076)	(9,374)	(10,253)	(11,076)	(12,027)	(12,928)	(13,682)	(14,698)
Loan Activity	(8,291)	0	0	0	0	0	0	0
Investment Income	<u>179</u>	<u>277</u>	<u>331</u>	<u>348</u>	<u>377</u>	<u>403</u>	<u>428</u>	<u>458</u>
Net Cash Flow	(\$6,219)	\$667	\$756	(\$50)	\$152	\$128	\$171	\$157
Beginning of Year Loan Balance	\$8,291	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Additional Loans / Interest	145	0	0	0	0	0	0	0
Loan Repayments	<u>(8,436)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
End of Year Loan Balance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
End of Year Net Position	\$695	\$1,363	\$2,119	\$2,068	\$2,220	\$2,348	\$2,518	\$2,676

*Reflects estimated reduction in costs from excess HIC receipts.